Spring Undergraduate Research Forum

Welcome to SURF 2021

The 28th Annual Celebration of Achievements in Undergraduate Research at Elon University

The Spring Undergraduate Research Forum (SURF) is a time each year when we suspend our other campus activities to celebrate the academically centered creative endeavors and research efforts of Elon's students. Due to COVID-19, SURF 2021 is entirely online. The oral presentation sessions will occur via Zoom Webinars, while the poster presentation sessions will be carried out via Gather. SURF 2021 has a total of 234 presentations, including two interdisciplinary symposia named "South Asia and the Challenges of the Twenty-first Century" and "Sustainability Across the Disciplines". Fifty-eight of these presentations are self-identified as projects related to topics about diversity, equity, inclusion (DEI), and anti-racism. They are marked with an asterisk (*) in the presentation title. One student from University of North Carolina at Chapel Hill and two students from Chapel Hill High School also join us this year by presenting their posters. Each SURF abstract was reviewed by two Elon faculty members with disciplinary expertise.

SURF brings to light our students' wonderful academic and creative pursuits. We invite you to join and support the student presenters and performers as they share the joy of exploration and discovery that are the hallmarks of an intellectual community.

Undergraduate Research Program Advisory Committee

Dr. Kevin Bourque	Dr. Paula Rosinski
Prof. Joel Hollingsworth	Dr. Jonathan Su
Prof. Erin Hone	Dr. Rissa Trachman
Dr. Tonmoy Islam	Dr. David Vandermast
Dr. Ryan Kirk	Prof. Bill Webb
Dr. Erika Lopina	Dr. Meredith Allison (Director)
Dr. Titch Madzima	Dr. Jen Hamel (Interim Associate Director)
Dr. Kristina Meinking	Dr. Qian Xu (Associate Director)
Dr. Barbara Miller	

Undergraduate Research & Creative Endeavors include activities undertaken by undergraduate students with significant faculty mentoring that:

Lead to new scholarly insights and/or the creation of new works;
Add to the discipline; and
Involve critical analysis of the process and/or outcome of the activities.

Quality undergraduate research and creative activity result in a product that has potential for peer-reviewed dissemination in the form of presentations, publications, exhibitions, or performances.

About Tech Platforms Used for SURF 2021

The Zoom links for oral presentations and the Gather links for poster presentations are embedded in the room names listed in this program (p. 3-4 & 5-23). Click them to access the presentations.

This demo video (https://tinyurl.com/4aw3ydb7) explains how to use Gather for poster presentations. Each Gather poster room also has multiple informational stands providing room navigation instructions (https://tinyurl.com/3un56tze).

The SURF poster rooms in Gather are restricted to Elon email addresses for security reasons, so you must use your Elon email address to sign in. Click this document (https://tinyurl.com/vnbfwhv3) to get information on how to sign in to Gather and access the SURF poster rooms.

The above information is also available on SURF 2021 Moodle page. Just click this link and enroll yourself. The posters are archived on this page and will be accessible for one week after SURF day.

Undergraduate Research Student Association (URSA)

The Undergraduate Research Student Association is an organization on campus that acts as the student-run counterpart to Elon's Undergraduate Research Program. They help undergraduate students get involved with research as well as act as a cohort for upperclassmen already doing research. URSA is looking for new members as well as people to fill leadership positions next semester.

Please join URSA for a forum/discussion panel via Zoom at **6-7 pm (ET) on May 3rd** with Elon students currently doing research. All are welcome! Scan the QR code on the right to fill out the form or contact us for more information.

To contact URSA:
URSAelon2021@gmail.com
Faith Glover, President of URSA: fglover@elon.edu

Special Thanks

Planning a large event like SURF requires a team. We would like to thank the many people who helped make this virtual event possible:

- Faculty mentors are an integral part of this process. Thank you to the wonderful mentors who supported students in their scholarship and creative endeavors.
- Thank you to the reviewers who provided constructive feedback on student abstracts.
- We would also like to extend the appreciation in advance to all the moderators who will ensure the oral presentation sessions are run smoothly and on time.
- We would like to thank Julia Bleakney from the Writing Center for her poster workshops that helped students prepare for SURF.
- Many people from Teaching and Learning Technologies and Information Technology have provided all kinds of fantastic support to help with the setup of this virtual event, particularly Brent Smith, Dallas Smith, Ted Morée, Ben Tupper, and Claudia Sparks.
- Our program assistant, Tammy Womack, and the Powell 108 student workers, Hannah Allen, Rachel Mullenix, and Virginia Morrison have worked hard on the preparations for virtual SURF day.

PROGRAM LISTING BY SESSION AND TIME

(Click the room name to access the related Gather or Zoom link. Click the page number for presentation information. All listed times are Eastern.)

Poster Session I (8:30am-9:50am ET)	
Gather Poster Room 1: Poster # 1-21b	5
Gather Poster Room 2: Poster # 22-42	6
Gather Poster Room 3: Poster # 43-63	7
Oral Presentation Session I (10:00am-11:40am ET)	
Zoom Room 1: Education	14
Zoom Room 2: Economics	14
Zoom Room 3: Biology	14
Zoom Room 4: Special Session on Migrants and Refugees	15
Zoom Room 5: Exercise Science	15
Zoom Room 6: Sociology & Anthropology	16
Zoom Room 7: World Languages & Cultures	16
Zoom Room 8: Communications	16
Zoom Room 9: English	17
Oral Presentation Session II (12:20pm – 2:00pm ET)	
Zoom Room 1: Education	17
Zoom Room 2: Economics	17
Zoom Room 3: Biology, Environmental Studies	18
Zoom Room 4: Symposium I. **South Asia and the Challenges of the Twenty-first Century**	18
Zoom Room 5: Physics, Chemistry	19
Zoom Room 6: Performing Arts	19
Zoom Room 7: International & Global Studies	19
Zoom Room 8: Psychology	20
Zoom Room 9: Carret Essay Contest	20
Oral Presentation Session III (2:20pm – 4:00pm ET)	
Zoom Room 1: Human Service Studies, Public Health Studies, Physical Therapy Education	20
Zoom Room 2: Sport Management, Marketing & International Business, Management & Entrepreneurship, Finance	21
Zoom Room 3: Computer Science & Mathematics	21
Zoom Room 4: Symposium II. **Sustainability Across the Disciplines**	21
Zoom Room 5: Chemistry	22

Zoom Room 6: Performing Arts, Music	22
Zoom Room 7: Political Science & Policy Studies	22
Zoom Room 8: Psychology, Religious Studies	23
Zoom Room 9: History & Geography	23
Poster Session II (4:10pm-5:30pm ET)	
Gather Poster Room 4: Poster # 1-23	10
Gather Poster Room 5: Poster # 24-47	11

ABSTRACTS BY DEPARTMENT/PROGRAM

(Click the page number for the related abstracts.)

Symposium I. South Asia and the Challenges of the Twenty-first Century			24
Symposium II. Sustainability Across the Disciplines			29
Arts Administration	32	Management & Entrepreneurship	102
Biology	32	Marketing & International Business	104
Center for Design Thinking	38	Mathematics & Statistics	106
Chemistry	39	Media Analytics	111
Cinema & Television Arts	48	Music	112
Communication Design	48	Performing Arts	115
Computer Science	50	Physical Therapy Education	118
Economics	51	Physics/Engineering	121
Education & Wellness	56	Political Science & Policy Studies	126
English	69	Psychology	130
Environmental Studies	75	Public Health Studies	142
Exercise Science	76	Religious Studies	146
Finance	85	Sociology & Anthropology	148
History & Geography	86	Sport Management	155
Human Service Studies	91	Strategic Communications	156
International & Global Studies	95	World Languages & Cultures	157
Journalism	101		

Poster Session I (8:30am-9:50am ET)

(Click the room name to access the Gather link.)

#	Presentation Information
Gather Poster Room 1 (https://gather.town/app/r2JOi2rEtDHDYmWP/PosterRoom1)	
1	**Dierdre Shivak** Dr. E. Stephen Byrd The Relationship Between Educator Expectations and Burnout in Special Education Teachers
2	**Ciara L. Sutherburg** Prof. Elizabeth Bailey The Effect of Content Based Activity Breaks on Lesson Engagement in Male and Female Students in the 5th and 7th Grade
3	**Sara I. Mason** Dr. Jim Bisset The Teaching of Slavery in Public Schools and the Resources Available to Educators*
4	**Megan Rose Aurentz** Prof. Marna K. Winter How Teachers Help Struggling Readers Choose Books
5	**Lana H. Newman** Prof. Marna K. Winter Teacher Strategies for Supporting Reluctant Readers
6	**Maddie G. Walter** Dr. Dani Lane Teacher Considerations Within the Inclusion Classroom*
7	**Grace J. Kennedy** Prof. Margaret Chapman Grade Relationships: How Students Feel About Grades
8	**Rachel A. Leonard** Dr. E. Stephen Byrd The Effect and Understanding of Trauma in Elementary Schools
9	**Celia Z. Skulnik** Dr. E. Stephen Byrd Friendship in an Inclusive Classroom Through Meaningful Interactions
10	**Madeleine F. August** Dr. Takudzwa Madzima Affective Responses Before and After Two Competitive Matches in NCAA Division I Men's Soccer Athletes
11	**Emily Kibler** Dr. Aaron T. Piepmeier The Effects of Pilates and White Noise on Attention in College Students with ADHD*
12	**Hannah G. King** Dr. Aaron T. Piepmeier Yoga and Fatigue in Breast Cancer Survivors: An Online Feasibility and Efficacy Study
13	**Kyra R. VanDoren & Rod A. Salazar** Dr. Takudzwa Madzima Acute Affective and Lymphedema Responses to Resistance Exercise at Various Intensities in Breast Cancer Survivors
14	**Katherine A. Griffin** Dr. Caroline Ketcham The Effect of Music Therapy on Motor Movement
15	**Jessica James, Chelsea Comeau, & Samantha Everett** Dr. Srikant Vallabhajosula & Dr. Crystal Ramsey Effect of Wearing Cooling Vests and Dual-tasking on Fatigability in Individuals with Multiple Sclerosis

16	**Caroline E. Tunis, Jessica M. Terrell, & Lucy M. Sneader**	Dr. Srikant Vallabhajosula & Dr. Stephen Bailey
	Does Level of Caffeine Improve Physical Performance in Older Adults?	
17	**Jay D. Tiemann**	Dr. Vanessa Drew-Branch
	Narrative Experiences of Transmasculine Individuals in American Jails and Prisons*	
18	**Daniel T. Bascuñan-Wiley**	Prof. Monica Burney
	The Food Empowerment Series: Exploring the Efficacy of Empowerment-Based Community Programs	
19	**Rebecca M. Collins**	Dr. Vanessa Drew-Branch
	Resilience Despite Chronic Adversity: How Communities Foster Resilience in Youth*	
20	**Elizabeth A. Bassett**	Dr. Stephanie Baker
	Examining the Relationship Between Neighborhood and Self-Reported Health	
21	**Min Stanwyck**	Dr. Yanica Faustin
	Understanding Hospital Level Factors and Severe Maternal Morbidity and Mortality: An Integrative Literature Review*	
21b	**Margaret F. Davis**	Dr. Bud Warner
	Hospital to School: Transitions for Children with Special Healthcare Needs	

Gather Poster Room 2 (https://gather.town/app/GSL8VRXiW6IVF4Rj/PosterRoom2)		
22	**Arun A. Kirk**	Dr. Crista Arangala
	Simulating Long-Term Wealth Distribution in the United States*	
23	**Abigail Weber**	Dr. Crista Arangala
	Ranking Teams in the NCAA March Madness Tournament	
24	**Lexi B. Uknis**	Dr. Aaron Trocki
	Analyzing the Effects of a Revised Curriculum in a Content Course for Middle & Secondary Mathematics	
25	**Maia E. Tice**	Dr. Aaron Trocki
	Investigating Number Sense in a Math II Course	
26	**Luciana Ferman**	Dr. Crista Arangala
	Solutions to Multicolor Lights Out	
27	**Thomas M. Loflin**	Dr. Crista Arangala
	The NFL Combine's Effectiveness in Predicting Future Player Success	
28	**Timothy P. Redgrave**	Dr. Scott Spurlock
	Peering Under the Mask: Reconstructing Masked Faces Using Adversarial Networks	
29	**Alex J. Hebert**	Dr. Richard Blackmon
	Constructing A Portable Sub-Surface Optical Coherence Tomography Imaging System	
30	**Stratton K. Bacogeorge**	Dr. Benjamin Evans
	Performance Testing on Chained-Particle Magnetic Polymers for Soft Robotics	
31	**Emma F. Walker**	Dr. Sirena Hargrove-Leak
	Imagining Project Goals for a Project-Based Learning Experience in Elon's Biomedical Engineering Curriculum	

32	**Samantha R. Dominguez, Shalexzandra A. Dunkley, Kathryn G. Ellington, Timothy P. Verlander, & Timothy Olson**	Dr. Jonathan Su
	Integration of Wonderware Software at AKG of America: Optimizing Efficiency and Traceability at the Industrial Furnace	
33	**Margaret E. Cox, Henry R. Chance, Stratton K. Bacogeorge, & Anne S. Williams**	Dr. Jonathan Su
	Use of Nickel-Silicone Composites for Applications in Magnetic Hyperthermia	
34	**Hannah A. Durkin**	Dr. David Vandermast
	Monitoring Changes in the Composition and Structure of Vegetation in Elon University Forest over 10 Years	
35	**Nicholas Urbanski**	Dr. Jennifer Uno
	The Protective Role of S. Epidermidis Against Skin Cancer Across Various Demographic Groups	
36	**Melissa B. Denish**	Dr. Tonya Laakko Train & Dr. Kathryn Matera
	Modeling and Investigating the Molecular Basis of Tay-Sachs Disease	
37	**Austin K. Burnett**	Dr. David Vandermast
	Determining the Soil Seedbank in Elon University Forest	
38	**Samantha E. Eastman**	Dr. Jen Dabrowski
	Investigation of the Structural Properties of Vanadium-Tetracycline Complexes	
39	**Connor R. Smith**	Dr. Victoria Del Gaizo Moore
	Collateral Sensitivity of Acute Myeloid Leukemia	
40	**Haileigh Houser**	Dr. Kathryn Matera
	Enzyme Kinetics of Thyroid Peroxidase and Characterization of Oxidized Substrates	
41	**Mary C. Leupold**	Dr. Kathryn Matera
	Interactions Between Insulin and Amyloid-Beta peptides: The Relationship Between Diabetes and Alzheimer's Disease	
42	**Reiley K. Overend**	Dr. Jen Dabrowski
	Investigation of the Structural and Antibiotic Properties of Vanadium Beta-lactam Complexes	

Gather Poster Room 3 (https://gather.town/app/bc821GDyffTPzU0P/PosterRoom3)		
43	**Sofia Cordova & Grace Feiner**	Dr. Sabrina Thurman
	Infant Locomotor Experience and Cognitive and Social Development: A Review	
44	**Liza R. Margules**	Dr. David Buck
	The Role of Education and Contact in Predicting Transprejudice*	
45	**Amanda H. Ornstein**	Dr. CJ Fleming
	Shutting Down During Shutdown? Predictors of Depression and Anxiety in Working Adults during the Early COVID-19 Pandemic	

46	**Rachel C. Fultonberg** Dr. Katie King Knowledge of Autism Spectrum Disorder Among Speech-Language Pathologists, Parents, and College Students*
47	**Jordyn L. Cowan & Madison K. Tarkenton** Dr. Amy Overman Multisensory Integration and Associative Memory in Aging
48	**Olivia G. Haskell** Dr. William Schreiber Exploring Depression as a Learning Deficit
49	**Courtney E. Kollar** Dr. Meredith Allison Alibi Corroborators: Relationship with Defendant, Certainty, and Cooperativeness
50	**Eleanor R. Scimone & Julia S. Gorgol** Dr. William Schreiber Characterization of Ant Sensory Systems and Features Influencing Locomotor Activity
51	**Julia S. Gorgol, Carly T. DeSesa, & Eleanor R. Scimone** Dr. William Schreiber Examining Stock Harness Habituation in Harvester Ants
52	**Haley M. Love** Dr. Kim Pyne Breaking Open the Canon: Diversifying Literature in the English Classroom*
53	**Hayley Risk** Dr. Heather Lindenman Reading is Believing: The Power of Culturally Responsive Literature*
54	**Emily P. Holland** Dr. Julia Bleakney "Thanks, Writing Center!": Analyzing the Workplace Writing Experiences of Writing Center Consultant Alumni
55	**Victoria Egan** Dr. Alexis Franzese Nostalgia in Travel: Examining Walt Disney World as a Destination that Curates Sentimentality
56	**Elisabeth L. Wright** Dr. Raj Ghoshal Diversity in the #MeToo Movement*
57	**Katarina M. Aulbach** Dr. Alexis Franzese Diversity, Equity, Inclusion, and Mental Health: Evaluating Access, Utilization, and Benefits of Yoga*
58	**Mikaela D. Benton** Dr. Laura Roselle & Dr. Jessica Carew The Responses of Women of Color in the House of Representatives to President Trump's Tweets*
59	**Henry Gartner & Mikayla Ford** Dr. William Moner & Dr. Danielle Lake Developing a Workshop to Address High School Mental Health Through Human-Centered Design
60	**Catherine E. Dalrymple** Dr. Harlen Makemson The Army-McCarthy Hearing: Analyzing Attitudes in Front-Page Articles from the New York Times and Washington Post, April-June, 1954
61	**Payton Byrnes** Dr. Alex Luchsinger Exploring Ecofeminism: A Study Through Content Analysis and Multimedia Reporting

62	**Briana C. Edwards** The Representation of Women in Hip-Hop Lyrics Before and During the #MeToo Movement*	Dr. Qian Xu
63	**Zachary N. Cioffi** Analyzing the Financial Structure Between the MLB Draft and Minor League Baseball: The Salary Fairness in Minor League Baseball	Dr. Young Do Kim

***Note**:* The presentations with an asterisk (*) in the titles are self-identified as projects related to the topics of diversity, equity, inclusion (DEI), and anti-racism.

Poster Session II (4:10pm-5:30pm ET)

(Click the room name to access the Gather link.)

#	Presentation Information
Gather Poster Room 4 (https://gather.town/app/5e3n6hfyYJx6JkV5/PosterRoom4)	
1	**Allie Mae Hawley** Dr. Scott Morrison The North Carolina School Garden Network
2	**Jake C. Cisternelli** Dr. Jeffrey Carpenter Teacher Disclosure Dilemmas in the 21st Century
3	**Kelly R. Hunter** Dr. Scott Morrison Exceptional Plans for Exceptional Students: Understanding Emergency Crisis Policies and Procedures
4	**Makenzie M. Mason** Dr. Heidi Hollingsworth Investigating Pedagogical Differences Between Montessori and Public Kindergarten Classrooms
5	**Dorothy P. Boudett** Dr. Paula Patch Perspective in the Pandemic: Pass/Fail Grading and Student Mental Health
6	**Alyssa C. Herrmann** Dr. Katherine Baker A Self-Study of Learning to Teach Elementary Mathematics Outside
7	**Madison A. Hayes** Dr. Carol Smith Women's Body Perception in Outdoor Recreation
8	**Sally Doehr** Dr. Elena Schoonmaker-Gates How Gender is Presented in Language
9	**Kamaria L. Majors** Dr. Elena Schoonmaker-Gates Investigating Patient Preference: A Study Comparing Informal and Professional Interpretation Methods in Healthcare*
10	**Margaret E. Cox, Megan Casner, & Mikayla Ford** Dr. Danielle Lake Impact of Design Thinking within the Classroom: A Cross-Institutional Pedagogical Study
11	**Noelle S. Bates** Dr. Jennifer J. Carroll Representations of Mental Health in Horror and Thriller Film: A Sociolinguistic Analysis
12	**Elizabeth R. Bettuelli** Dr. Jennifer J. Carroll A Lack of Access: How Stigmatizing Perceptions from Non-Opioid Users Dictates the Treatment of People Who Use Opioids
13	**Lauren M. Siedlecki** Dr. Beth Warner Using the Artistic Process to Identify Resilience in Young Adults During Quarantine
14	**Kelly J. O'Neil** Prof. Monica Burney How Has COVID-19 Affected the Elon Student Experience: A Self-rated, Comparative Analysis of Student Well-being pre and post COVID-19

16	**Ben House, Nia Griffin, & Grace Granger**	Dr. Elena Kennedy
	Examining Small Business Use of Cross-promotion of Social Media Across Communities in Alamance County	
17	**Marlo J. Neske**	Dr. Brittany K. Mercado
	An Investigation into the Role of Age and Performance on Perceptions of Pay Disparity	
18	**Sophie T. Blumenfeld**	Dr. Brittany K. Mercado
	Why Does Cyberloafing Help You and Hurt Me? An Investigation into the Role of Personality on Cyberloafing and Stress	
19	**Kylee N. Hebert**	Dr. Prachi Gala
	Moderating Role of Corporate Social Responsibility and Team Net Worth on Consumer Authenticity Perceptions for Professional Sport Leagues in North America	
20	**Andrew M. Jackson**	Dr. Chris Harris
	Corporate Social Responsibility and Trade Credit Policy	
21	**Hannah Feldhues**	Prof. Renay Aumiller
	Aoibhneas: Utilizing Semiotic Theory as a Tool in Choreography	
22	**Sydney S. Dye**	Dr. Susanne Shawyer
	Integrating Social Media into Theatrical Storytelling through Projection Design to Cultivate Productive Conversations about Confederate Memorials*	
23	**Sarah J. McNamee**	Prof. Lauren Kearns
	The Physical, Mental, and Creative Implications of Dance as a Form of Play: A Comparison of Collegiate Pre-professional and Recreational Dancers	

Gather Poster Room 5 (https://gather.town/app/iSjVxzLOajX9mgQ0/PosterRoom5)		
24	**Sarah N. DeSordi & Emma M. McCabe**	Dr. Aaron Piepmeier
	Mental Health and Student-Athletes: Actual and Perceived Barriers to Help-Seeking Behavior	
25	**Ben M. Rosicky**	Dr. Eric Hall
	Using Personality and Temperament to Predict Exercise Behavior: A Pilot Study of the Braverman Nature Assessment	
26	**Rachael S. Wesolowski**	Dr. Lauren Walker
	Athletic Coaches' Perceptions of the NFHS Captain's Leadership Course	
27	**Simon A. Wright**	Dr. Eric Hall & Dr. Lauren Walker
	Effects of Workplace Stress, Perceived Stress, and Burnout on Collegiate Coach Mental Health Outcomes	
28	**Mackenzie K. Boyd**	Dr. Aaron Piepmeier
	Pilates for Breast Cancer Survivors Experiencing Cancer-Related Fatigue and Cancer-Related Cognitive Impairment	
29	**Andrew Whyte, Sarah Henderson, & Brandi Wiltshire**	Dr. Srikant Vallabhajosula & Dr. Susan Chinworth
	Examining Force Exertion Over a Five Time Sit-to-Stand Task in Healthy Young Adults	

30	**Grace Feiner** The Role of Infant Locomotor Experience in Planning and Problem-Solving in a Whole-Body Object-Retrieval Task	Dr. Sabrina L. Thurman
31	**Sofia Cordova** Developmental Niches of Infant Motor Development in the USA	Dr. Sabrina L. Thurman
32	**Carly T. DeSesa, Olivia G. Haskell, & Laura Ackerman** Evidence for Habituation of Locomotor Behavior in Harvester Ants	Dr. William Schreiber
33	**Colleen Egan, Alex Hebert, James Warren, Orlanzel Washington, & Jackson Abele** Gram Constructing a Method to Detect Helicoils in a Cooling Tank mar Guides across the Disciplines	Dr. Jonathan Su
34	**Chris J. Dellosso, Paloma C. Dettloff, Harry C. Masker, William G. Tunis, & Emma F. Walker** Extracting Cellulose from Invasive Species to Produce Medical Gauze Pads	Dr. Jonathan Su
35	**Chloe Radigan, Noah Kagan, & Morgan Sperry** On the Development of Affordable Electrochemical Devices for Monitoring Biogeochemical Processes in Constructed Wetlands	Dr. Scott Wolter
36	**Georgia Gurney, Charles Walsh, Trent Houpt, & Alexander Sobel** On the Development of Affordable Gas Sensors for Monitoring Biogeochemical Processes in Constructed Wetlands	Dr. Scott Wolter & Dr. Brant Touchette
37	**Nathan D. Blohm** Development of a Lab to Improve Student Understanding of the Photoelectric Effect and its Implications	Dr. Anthony Rizzuto
38	**Margaret A. Canavan** Synergistic Effects of Anti-Cancer Drug Administration on Acute Myeloid Leukemia	Dr. Victoria Del Gaizo Moore
39	**Anna C. Sheinberg** Investigation of Carbonic Acid Kinetics Under Physiological Conditions	Dr. Anthony M. Rizzuto
40	**Carolyn E. Vaughan** NUT Carcinoma: Investigating Drug Synergy and the Building of Drug Resistance	Dr. Victoria Del Gaizo Moore
41	**Anna C. Altmann** Determination of Trace Metal Content in Cigarette Butts	Dr. Justin Clar
42	**Hayley Clos** Assessing the Effects of Climate Change on the Release of Metals into Agricultural Products	Dr. Dan Wright
43	**Natalie S. Salerno** Investigation of Key Reaction Conditions in the Synthesis of Vanadium Antibiotic Complexes	Dr. Jen Dabrowski
44	**Catherine M. LoGrande** A Mathematical Model of Interspecies Behavioral Patterns	Dr. Crista Arangala

45	**Gabriel Ackall, Richard Yuan, & James Sprow** A Singular Value Decomposition Spellchecker	Dr. Crista Arangala
46	**Shannon E. Treacy** Mathematical Modeling of Dengue Fever Focusing on the Mosquito Life Cycle and Preventative Measures	Dr. Karen Yokley
47	**Amy E. Moore** Measuring Gerrymandering: Investigating the Distributions of Party Ratios for Districting Techniques	Dr. Todd Lee & Dr. Crista Arangala

Note: The presentations with an asterisk (*) in the titles are self-identified as projects related to the topics of diversity, equity, inclusion (DEI), and anti-racism.

Oral Presentation Session I (10:00am-11:40am ET)

(Click the room name to access the Zoom link.)

Zoom Room 1: Education (Moderator: Prof. Erin Hone)
https://elon.zoom.us/j/92169434343?pwd=NStjZEVJcHhVbTlPWnhuRjhVVWdFUT09

10:00am	**Elizabeth H. Norvell** Examining Prospective Teachers' Awareness and Perceptions of Trauma-Informed Teaching Approaches*	Dr. Katherine Baker
10:20am	**Lucy T. Callicott** Examining Elementary Educators' Awareness and Perceptions of Trauma-Informed Teaching Approaches	Dr. Katherine Baker
10:40am	**Sydnie M. Holder** Amplifying Jewish Student Voices: Exploring the Experiences of Jewish Students in Public School Settings*	Prof. Erin Hone
11:00am	**Allie P. Forsterer** Building a Mathematical Community when Pivoting to Virtual Learning: A Case Study of a Kindergarten Virtual Classroom	Prof. Erin Hone
11:20am	**Chandler A. Vaughan** Policy Effects on Teachers at Juvenile Detention Centers Across the U.S.*	Dr. Aaron Sparks & Dr. Scott Morrison

Zoom Room 2: Economics (Moderator: Dr. Tonmoy Islam)
https://elon.zoom.us/j/95244125322?pwd=MWdjdkpQV0hiY2N5TG50MHZweDFtZz09

10:00am	**Maxwell J. Zucker** Predicting Power: Investigating the Relationship between Economic Growth and Geopolitical Influence	Dr. Mark Kurt
10:20am	**Kelley M. McCarten** Investigating the African Gender Education Gap	Dr. Tina Das
10:40am	**Alexa Rae Rasmussen** Is Having a Child Damaging to a Woman's Earning Potential: A Regression-Based Analysis of the Motherhood Penalty*	Dr. Steve DeLoach
11:00am	**Morgan C. Rafferty** The Gender Effect of a Nation's Leader on Environmental Performance	Dr. Casey DiRienzo
11:20am	**John M. McGinley** The Impact of Childhood Parasitic Infection on Future Wages in Indonesia	Dr. Tonmoy Islam

Zoom Room 3: Biology (Moderator: Dr. Yuko Miyamoto)
https://elon.zoom.us/j/99345464307?pwd=bWp1UVV2OG9LMG1CZzBLbnRyVXB3QT09

10:00am	**Kevin M. K. Scott** Investigating the Effect of a High Salt Environment on HER2+ Gastric Cancer Cells through SIK3 Protein Activation	Dr. Yuko Miyamoto
10:20am	**Sophie Erlich** Investigation of Medicinal Properties of Crassocephalum crepidoides	Dr. Linda M. Niedziela

10:40am	**Sean R. Janovic** Dr. Tonya L. Train Investigation of Senolytic Molecules in SH-SY5Y Neurons
11:00am	**Grace M. Garrett** Dr. Jennifer K. Uno The Gut Microbiome and its Influence on Hormones and Fertility in Zebrafish
11:20am	**Ryan A. Wagner** Dr. Eric Bauer The Effects of E-cigarette Toxins on the Behavior of Adult Zebrafish

Zoom Room 4: Special Session on Migrants and Refugees (Moderator: Dr. Sandy Marshall) https://elon.zoom.us/j/99764902107?pwd=aHIzc05KZ0V2VE40V3Q3bmY0d1NaZz09	
10:00am	**Jane M. Williams** Dr. Sandy Marshall Migration, Security, and Climate Change: Analyzing Cape Verde and Morocco's Mobility Partnerships with the European Union
10:20am	**SJ McDonald** Dr. Mussa Idris The Role of Religion in the Lives of Refugees from Africa's Great Lakes Region Resettled in Greensboro, N.C.*
10:40am	**Sydney R. Hallisey** Dr. Damion Blake Female Narratives in Forced Migration: Syrian Refugees in Turkey*
11:00am	**Kylee M. Smith** Dr. Sandy Marshall Practices, Beliefs, and Identities: Muslim Immigrants' Acculturation to the United States*
11:20am	**Lucia Lozano Robledo** Dr. Michael Matthews Political consciousness of Latinx Migrants in Alamance County*

Zoom Room 5: Exercise Science (Moderator: Dr. Simon Higgins) https://elon.zoom.us/j/97315579342?pwd=eldJc1FMa0VzdnhzbE9qSEZqZTl5dz09	
10:00am	**Peyton N. Carter** Dr. Caroline Ketcham & Dr. Eric Hall Not Just For Dancing?: A Content Analysis of Concussion and Head Injury Videos on TikTok
10:20am	**Hailey E. Jurgens & Sara A. Higgins** Dr. Svetlana Nepocatych & Dr. Takudzwa Madzima The Effects of Tart Cherry Juice and Whey Protein on Recovery Following Exercise Induced Muscle Damage
10:40am	**Alexandra N. Smith** Dr. Simon Higgins Behavior Change Trajectories and Metabolic Syndrome Risk Factor Clustering During the Transition to College: A Pilot Study
11:00am	**Emily J. Tufford** Dr. Eric Hall & Dr. Caroline Ketcham The Relationship Between Body Image and Mental Health in Undergraduate Students
11:20am	**Emma M. McCabe** Dr. Caroline Ketcham & Dr. Eric Hall Perspectives on the Relationship Between Nutrition and Mental Health within NCAA Division I Collegiate Athletic Programs

Zoom Room 6: Sociology & Anthropology (Moderator: Dr. Alexis Franzese) https://elon.zoom.us/j/93535078538?pwd=V0VKSnF6UC9BNklqWkdyQkYrNElFZz09	
10:00am	**Mackenzie Sara Martinez** Dr. Jennifer Carroll The Rituals of Womanhood: An Autoethnographic, Cross-Cultural Study of Female Coming of Age Ceremonies in Jewish and Latinx Cultures*
10:20am	**Seth L. McKee** Dr. Alexis Franzese Decreasing Burnout Among Pre-Health Undergraduates: Does an Authentic Interest in Coursework Matter?
10:40am	**Ana Eguiguren** Dr. Alexis Franzese Perceptions and Conceptualizations of Race and Racism in the Ecuadorian Context*
11:00am	**Erin O. Swisher** Dr. Tom Arcaro Humanitarians of the Majority World: A Look into the Lives of National Aid Workers

Zoom Room 7: World Languages & Cultures (Moderator: Dr. Sarah Glasco) https://elon.zoom.us/j/97979059308?pwd=c1VqQWtlK1lrSnltdFlWRC83blFNQT09	
10:00am	**Allison A. Curran** Dr. Sarah Glasco Image is Everything: #MeToo VS. #BalanceTonPorc* (This project will be presented in French.)
10:20am	**Ana N. Newberry** Dr. Sarah Glasco Social Justice à la Coco Chanel* (This project will be presented in French.)
10:40am	**Julia L. Madden** Dr. Sarah Glasco Immigrant and Refugee Struggles as Revealed in Narratives by Two Female, Francophone Authors (This project will be presented in French.)
11:00am	**Julia N. Towner** Dr. Scott Windham, Dr. Victoria Fischer-Faw, & Dr. Polly Cornelius Of Love and Loss: The Literal and Metaphorical in Franz Schubert's "Der Hirt auf dem Felsen"
11:20am	**Jo A. Fradkin** Dr. Mayte de Lama Oh Mother, Who Art in Hell: Examining Internal and External Conflicts of Immigrant Women Through the Work of Carmen Jiménez (This project will be presented in Spanish.)

Zoom Room 8: Communications (Moderator: Dr. Shannon Zenner) https://elon.zoom.us/j/99237254777?pwd=NHJpbEJJQ1Z6UWIxR0w0WjRGdXRjUT09	
10:00am	**McKenzie E. Miller** Prof. Staci Saltz Bi-erasure is Not Funny: Bisexual Erasure and Representation in ABC's Scripted Comedies (Fall 2019) *
10:20am	**Jackson W. Spivey** Dr. Shannon Zenner Conflict Made Visible: A Content Analysis of the Murals of Northern Ireland
10:40am	**Amanda L. Gibson** Dr. Glenn Scott Journalists' Dilemma: Human Rights Coverage in the 1978 World Cup

11:00am	**Emily H. Weinberg** Dr. Daniel Haygood Authenticity Driving Change: Identifying Cues that Indicate Authenticity in Brand Storytelling Advertisements
11:20am	**Ashleigh D. Afromsky** Dr. Jenny Jiang & Dr. Qian Xu A Semantic Network Analysis of Media Analytics Job Postings: Challenges and Opportunities for Media Analytics Curricula in Higher Education During the Pandemic

Zoom Room 9: English (Moderator: Dr. Megan Isaac) https://elon.zoom.us/j/94820949117?pwd=ZkJrN3BwbHpHSHlHTGVGV0NTYlQyZz09	
10:00am	**Annie Earnshaw** Dr. Cassie Kircher Maternity and the Young Voice
10:20am	**Emily M. G. Lange** Dr. Megan Isaac Gender, Race, and Intersectionality in Afrofuturist Short Fiction
10:40am	**Angela D. Myers** Dr. Jessie Moore Rewriting Prevention: A Rhetorical Study of Online Sexual Assault Prevention Courses on U.S. and New Zealand College Campuses*
11:00am	**Julia A. Kocsis** Dr. Julia Bleakney Acknowledging and Addressing the Observed Decline in Client's Self-Esteem in the Writing Center During the COVID-19 Pandemic

Note: The presentations with an asterisk (*) in the titles are self-identified as projects related to the topics of diversity, equity, inclusion (DEI), and anti-racism.

Oral Presentation Session II (12:20pm-2:00pm ET)

(Click the room name to access the Zoom link.)

Zoom Room 1: Education (Moderator: Dr. Heidi Hollingsworth) https://elon.zoom.us/j/92169434343?pwd=NStjZEVJcHhVbTlPWnhuRjhVVWdFUT09	
12:20pm	**Abigail Maclean Wilson** Dr. Heidi Hollingsworth Philosophy in the Elementary School: A Solution for the Creativity Crisis
12:40pm	**Felicia Y. W. Robinson** Dr. Cherrel Miller-Dyce The Untold Stories of Desegregation: Learning from the Living Past*
1:00pm	**Erika E. Kim** Prof. Allison Bryan An Analysis of Representation of East Asians and East Asian Americans in Picture Books Published Since 1990*
1:20pm	**Ashley R. Billie** Dr. Joan Barnatt Understanding Influences on Cultural Competence in Teacher Candidates*
1:40pm	**Eleanor M. Gaudin** Dr. Joan Barnatt Secondary English Language Arts Teacher Response to Online Learning in 2020 Pandemic*

Zoom Room 2: Economics (Moderator: Dr. Brandon Sheridan) https://elon.zoom.us/j/95244125322?pwd=MWdjdkpQV0hiY2N5TG50MHZweDFtZz09	
12:20pm	**Graham O. Hutchinson** Dr. Brandon Sheridan The Economic Impact of Allowing Refugees the Right to Work

12:40pm	**Avery H. Keller** Dr. Brandon Sheridan Federal Reserve Announcement Shocks on United States Equities Markets, as Reflected in Volatility
1:00pm	**Caroline G. McGimsey** Dr. Andrew Greenland The Economic Impact of Critical Habitat Designations on Indigenous Communities in Northern Alaska
1:20pm	**Marybeth C. Nemecek** Dr. Katy Rouse The Impact of Technology Use on Cognitive and Non-cognitive Skills of Elementary School Students
1:40pm	**Kyle Fränkel** Dr. Katy Rouse An Analysis on the Relationship between High School Sports and Educational Outcomes

Zoom Room 3: Biology & Environmental Studies (Moderator: Dr. Jen Hamel) https://elon.zoom.us/j/99345464307?pwd=bWp1UVV2OG9LMG1CZzBLbnRyVXB3QT09	
12:20pm	**Katie T. Zinke** Dr. Linda Niedziela & Dr. Catherine Bush The Toxicology of the Trumpet Vine (Campsis radicans)
12:40pm	**Eliza P. Boudett** Dr. Gregory Haenel Hybrid Lizards on the Dark Side: Does Liver Pigmentation Prevent Cellular Damage?
1:00pm	**Jean Ross, Madi Gamble, Ciara Kernan, & Hannah ter Hofstede** Dr. Jen Hamel Multiple Functions for Multiple Signals: The Role of Sound and Vibration in Mediating Courtship and Competition in a Neotropical Katydid
1:20pm	**Emmanuela F. Salecki** Dr. Amanda Chunco & Prof. Patricia Thomas-Laemont Small Mammal Community Structure on a North Carolina Old Field Successional Plot

Zoom Room 4: Symposium I. South Asia and the Challenges of the Twenty-first Century (Moderator: Nicholas Hom) [Dr. Brian Pennington] https://elon.zoom.us/j/99764902107?pwd=aHIzc05KZ0V2VE40V3Q3bmY0d1NaZz09	
12:20pm	**Griffin P. Barriss** Prof. Amanda Tapler Transferring Knowledge into Action: Examining the Impact of a Rural-Indian Adolescent Girls Intervention at the Individual, Family, and Community Level*
12:20pm	**Madison E. Gray** Dr. Brian Pennington Cambodian American Religion in the United States*
12:20pm	**Annabelle Baker** Dr. Brian Pennington Bollywood and its Indian-American Audiences
12:20pm	**Lily J. Sandifer-Stech** Dr. Jason Kirk Investigating the Asian Infrastructure Investment Bank's "Best Practices" Commitment in Project Transparency and Accountability
12:20pm	**Srija Dutta** Prof. Amanda Tapler South Asian, College-Aged Women and the Influence of Religion and Cultural Factors on Sexual Decision Making*

Zoom Room 5: Physics & Chemistry (Moderator: Dr. Justin Clar) https://elon.zoom.us/j/97315579342?pwd=eldJc1FMa0VzdnhzbE9qSEZqZTl5dz09	
12:20pm	**Anne S. Williams** Dr. Benjamin A. Evans Magnetically Anisotropic Materials for Remote Heating and Sterilization of Silicone Medical Devices
12:40pm	**Tristan Torres** Dr. Karl Sienerth Using Surfactants to Solubilize Luminescors to Aid in the Detection of Explosives Through Fluorescence Quenching
1:00pm	**Connor T. Willis** Dr. Justin Clar Determination of Elemental Composition in Various E-Liquids
1:20pm	**Lauren O. Butler** Dr. Karl D. Sienerth & Dr. Anthony Rizzuto Investigating the Efficacy of a Rhodium-Centered Complex as a Catalyst for the Electrochemical Reduction of Carbon Dioxide
1:40pm	**Mylashia G. Cross** Dr. Justin Clar Analysis of Trace Metal Content in Cannabidiol Products

Zoom Room 6: Performing Arts (Moderator: Prof. Lauren Kearns) https://elon.zoom.us/j/93535078538?pwd=V0VKSnF6UC9BNklqWkdyQkYrNElFZz09	
12:20pm	**Lauren G. Mitchell** Prof. Lauren Kearns Yoga as an Intervention to Aid Dancers in the Reduction of Common Spinal Deviations
12:40pm	**Emily M. Gomez** Prof. Renay Aumiller Cuerpo Talk: Expressions of Latinx Identity Through Choreography*
1:00pm	**Tyler J. Okunski** Prof. Kim Shively Embodied Dramaturgy and its Role in Remote Learning
1:20pm	**Will Bruno** Dr. Susanne Shawyer Documenting Sex: A Dramaturgical Investigation of Various Frameworks of Sex Work Regulation
1:40pm	**Kelly Farmar** Prof. David McGraw Writing Women: Differences in Female Characterization in Drama*

Zoom Room 7: International & Global Studies (Moderator: Dr. Mussa Idris) https://elon.zoom.us/j/97979059308?pwd=c1VqQWtlK1lrSnltdFlWRC83blFNQT09	
12:20pm	**Pearl E. Sullivan** Dr. Casey DiRienzo A Seat at the Table or a Power Seat: The Impact of Simple Representation Versus Power Representation of Women in Government on Funding for Primary Education
12:40pm	**India L. Kirssin** Dr. Michael Matthews Making and Unmaking Memory: University Student Protest in Pinochet's Chile
1:00pm	**Molly L. Logan** Dr. Michael Matthews "Power for the People" or an "Eternal Quest for Power?": Race, Class and Democracy in Hugo Chávez's Venezuela*
1:20pm	**Mary C. Thibodeau** Dr. Mussa Idris The Social Impact of Gacaca Courts in the Reconciliation Process in Rwanda*

1:40pm	**Lucia Lozano Robledo** Dr. Sarah Glasco Traumatic Memory in Marie-Célie Agnant's Femmes aux temps des carnassiers and Le Livre d'Emma* (This project will be presented in French.)

Zoom Room 8: Psychology (Moderator: Dr. Anne-Marie Iselin) https://elon.zoom.us/j/99237254777?pwd=NHJpbEJJQ1Z6UWIxR0w0WjRGdXRjUT09	
12:20pm	**Carter E. Jenkins** Dr. Amy Overman Graph Theoretical Analysis of the Default Mode Network in Adults with Mild Cognitive Impairment and Alzheimer's Disease: An fMRI Project
12:40pm	**Lauren E. Beliveau, & McKenzie A. Boyer** Dr. Anne-Marie Iselin A Meta-Analysis of the Association Between Parental Psychological Control and Youth Emotion Regulation
1:00pm	**Nicole E. Hawley** Dr. Kim Epting Mission Accomplished: How Framing of Organizational Mission Statements Impacts Public Opinion
1:20pm	**Lauren C. Willingham** Dr. Alexa Darby Faculty Memorable Moments with Students in Service-Learning
1:40 pm	**Jenna N. Dahl** Dr. Buffie Longmire-Avital Factors of Medication Adherence of Black Women living with HIV During Covid-19*

Zoom Room 9: Carret Essay Contest (Moderator: Dr. Cassie Kircher) https://elon.zoom.us/j/94820949117?pwd=ZkJrN3BwbHpHSHlHTGVGV0NTYlQyZz09	
12:20pm	1st place
12:20pm	2nd place
12:20pm	3rd place

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Oral Presentation Session III (2:20pm-4:00pm ET)

Zoom Room 1: Human Service Studies, Public Health Studies, Physical Therapy Education (Moderator: Dr. Judy Esposito) https://elon.zoom.us/j/92169434343?pwd=NStjZEVJcHhVbTlPWnhuRjhVVWdFUT09	
2:20pm	**Daniel T. Bascuñan-Wiley** Dr. Bud Warner The Chilean Awakening: A Content Analysis of Protest Tweets During the 2019 Chilean Revolution
2:40pm	**Mariel Tivoli** Dr. Judy Esposito Incentives That Motivate Parents to Complete Parenting Classes*
3:00pm	**John M. McGinley** Dr. Katherine Johnson & Dr. Catherine Bush Access to Mental Health Care in the Montagnard Migrant Community: Examining Perspectives across Generations in North Carolina*

3:20pm	**Deena E. Elrefai** The Utility of a Community Advisory Board for Undergraduate Research*	Dr. Stephanie Baker
3:40pm	**Katelyn C. McCarthy** Athletic Identity and Body Image in Female Runners Across the Lifespan	Dr. Shefali Christopher & Dr. Garrett Bullock

Zoom Room 2: Sport Management, Marketing & International Business, Management & Entrepreneurship, Finance (Moderator: Dr. Lawrence L. Garber) https://elon.zoom.us/j/95244125322?pwd=MWdjdkpQV0hiY2N5TG50MHZweDFtZz09		
2:20pm	**Claire E. Latimer** #JumpingThroughHoops: A Case Study on Differences in Marketing Men's and Women's Basketball on Twitter*	Dr. Shaina Dabbs
2:40pm	**Alexander M. Wellendorff** The Effect of Stories Told by Celebrity versus Regular Person Endorsers on Consumer Perception of Luxury Goods	Dr. Lawrence L. Garber
3:00pm	**Meghan E. Murray** Leadership and Corporate Social Responsibility: The Role of Spiritual Intelligence	Dr. Carri Reisdorf
3:20pm	**Jannik Elmer** Exploring the Relationship between Corporate Social Responsibility and Financial Performance in the Oil & Gas Industry	Dr. Scott Hayward
3:40 pm	**Matthew H. Mitten** Investigating the Impact of Investor Attention on Volatility and Volume of Cryptocurrencies and Stablecoins	Dr. Chris Harris

Zoom Room 3: Computer Science & Mathematics (Moderator: Dr. Aaron Trocki) https://elon.zoom.us/j/99345464307?pwd=bWp1UVV2OG9LMG1CZzBLbnRyVXB3QT09		
2:20pm	**Katherine J. Grant** Social Network Analysis of Christian Identity Hate Groups Since the 1920's	Dr. Megan Squire
2:40pm	**Grant Nickell** Human Motion and Body Position Detection with a LIDAR-Based Depth Sensors	Dr. Ryan Mattfeld, Dr. Srikant Vallabhajosula, & Dr. Matthew Wittstein
3:00pm	**Kasey Collins** Investigating Technology Use in Secondary Mathematics Virtual Classrooms	Dr. Aaron Trocki
3:20pm	**Hanna Noelle Griesbach** Isomorphic Polynomials: When is a Polynomial Isomorphic to an Even Polynomial?	Dr. Chad Awtrey & Dr. Jim Beuerle
3:40pm	**Henry R. Chance** Tamely Ramified Invariants for p-adic Polynomials of Degree 2p	Dr. Chad Awtrey

Zoom Room 4: Symposium II. Sustainability Across the Disciplines (Moderator: Dr. Samantha DiRosa) https://elon.zoom.us/j/99764902107?pwd=aHIzc05KZ0V2VE40V3Q3bmY0d1NaZz09		
2:20pm	**Abigail Cates, Sarah Hope Dolce, & Julia Needham** Identifying Trends in Hybridization Between Native and Invasive Species	Dr. Amanda Chunco

2:20pm	**Taylor McMartin** Dr. Robert Perdue & Dr. Muriel Vernon Coming Clean: Pathways and Barriers to Transitioning from Animal Agriculture to "Clean Meat"
2:20pm	**Hannah E. Boone** Dr. Jennifer Carroll Fears for the Future: Youth Climate Change Activism
2:20pm	**Abigail M. Decker** Dr. Scott Morrison Gender(ed) Matters in Nature-Based Education

Zoom Room 5: Chemistry (Moderator: Dr. Victoria Del Gaizo Moore) https://elon.zoom.us/j/97315579342?pwd=eldJc1FMa0VzdnhzbE9qSEZqZTl5dz09	
2:20pm	**Savannah L. Kile** Dr. Kathryn Matera The Effect of the Myeloperoxidase Enzyme on Protein Tissue Oxidation and its Possible Implications in the Pathology of Rheumatoid Arthritis
2:40pm	**Seth L. McKee** Dr. Victoria Del Gaizo Moore Examining FOLFIRINOX Resistance in Pancreatic Cancer Through Creating Resistant Cell Culture Models
3:00pm	**Daniel J. Heintzelman** Dr. Anthony M. Rizzuto Kinetic Investigations of NOx Chemistry Pertaining to the Global Nitrogen Cycle
3:20pm	**Margaret H. Hughes** Dr. Justin Clar Assessing the Release and Transformation of Metal Additives from Consumer Plastics

Zoom Room 6: Performing Arts & Music (Moderator: Dr. Scott Proudfit) https://elon.zoom.us/j/93535078538?pwd=V0VKSnF6UC9BNklqWkdyQkYrNElFZz09	
2:20pm	**Lauren A. Memery** Dr. Scott Proudfit They Told Us We Were Girls: Examining the History of the U.S. Punk Music Scene's Attitudes Towards Gender, Sexuality, and Race*
2:40pm	**Alexander T. Schmidt** Dr. Victoria Fischer Faw Contrast vs. Unity, Simplicity vs. Complexity: Beethoven's Exploration of the Theme and Variations Principle
3:00pm	**Anthony Cancro** Dr. Victoria Fischer Faw Finding his Voice: Beethoven's Formal Innovations in the Early Period Piano Sonata Expositions
3:20pm	**Nicole M. Schapowal** Dr. Cora S. Palfy An Exploration of Different Methods Used to Enhance Cognitive Empathy in Music Therapy Practice and Formulation of a Practical Intervention
3:40pm	**Olivia M. Haley** Dr. Cora S. Palfy A Strategy for Improving Choral Expression Through an Understanding of Schema

Zoom Room 7: Political Science & Policy Studies (Moderator: Dr. Aaron Sparks) https://elon.zoom.us/j/97979059308?pwd=c1VqQWtlK1lrSnltdFlWRC83blFNQT09	
2:20pm	**Elizabeth K. S. Land** Dr. Aaron Sparks Racism and Environmentalism: How Racial Resentment Reduces Support for Climate Policy*

2:40pm	**Megan Z. F. Noor** Dr. Kaye Usry Confronting Islamophobia: Can Media Framing Create Greater Acceptance of American Muslims? *
3:00pm	**Anna V. Watson** Dr. Liza Taylor Revisiting Feminist Standpoint Theory with María Lugones*
3:20pm	**Mackenzie B. Ferguson** Dr. Carrie Eaves Congressional Candidate Quality: Examining the Effects of Candidate Quality in the 2018 Congressional Freshmen Class
3:40pm	**Pearl E. Sullivan** Dr. Laura Roselle "A Black Daughter of the South": An Analysis of Local and National Coverage of Stacey Abrams' Gubernatorial Campaign*

Zoom Room 8: Psychology & Religious Studies (Moderator: Dr. CJ Fleming) https://elon.zoom.us/j/99237254777?pwd=NHJpbEJJQ1Z6UWIxR0w0WjRGdXRjUT09	
2:20pm	**Kathryn M. Noon & Caroline L. Johnston** Dr. CJ Fleming Sexual Assault Resource Knowledge and Utilization by Elon University Students
2:40pm	**Caitlin R. Strickland** Dr. Katie King Teaching for Social Justice: An Oral History*
3:00pm	**Liora E. Wittle** Dr. Geoffrey Claussen Acceptance, Empowerment, and Change: The Experiences of LGBTQ Jewish Women at Camp Ramah and Beyond*
3:20pm	**Kaitlin V. Theall** Dr. Ariela Marcus-Sells The Promotion of Sufism as a Counter-Extremism Strategy in the Moroccan Press

Zoom Room 9:: History & Geography (Moderator: Dr. Charles Irons) https://elon.zoom.us/j/94820949117?pwd=ZkJrN3BwbHpHSHlHTGVGV0NTYlQyZz09	
2:20pm	**Jessica L. Cooper-Vastola** Dr. Wen Guo Curated Race on Instagram: Exploring Content Strategies of Art Museums in Racial Justice*
2:40pm	**Rebekah J. Maupin** Dr. Evan Gatti Materiality and Sensorial Experience at the Church of Orsanmichele
3:00pm	**Shannon R. Rogers** Dr. Michael Carignan The Victorian Working Class and Art Education: Analyzing the Work of John Ruskin*
3:20pm	**Kayla Spalding** Dr. Charles Irons Elon History and Memory Report: Exploring the History of Black Students and Anti-Black Racism on Elon University's Campus*
3:40pm	**Phoebe Mock** Dr. Lynn Huber Sex and Sex Acts: Reading the Erotic Frescoes and Graffiti in the Purpose-Built Brothel and Suburban Baths of Pompeii

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Symposia

Symposium I. South Asia and the Challenges of the Twenty-first Century

This symposium examines how South Asian cultural traditions are challenged, adapted, and extended as they meet the demands of the twenty-first century. It considers how the ethics of gender, nationalism, and mass migration have, on the one hand, impacted social realities in South Asia itself (particularly India) and, on the other, provided rich resources for identity-making and cultural adaptation outside of South Asia in various migrant communities from Cambodia to the United States. The practices, values, self-understandings, and social locations of various communities in or from South Asian countries undergo compelling transitions, even when those transitions entail new conservatisms that represent themselves as timeless or essential tradition. The context for those transitions may be rural Indian villages or the movie screens of the US. These projects explore how such disruptions as forced and voluntary migration, World Bank and public health interventions, and the globalization of media foster cultural and social change. The student projects that this symposium draws from represent a range of South Asian topics – village health knowledge among adolescent girls, Indian-American film-viewing habits, the survivals of Cambodia's religious practices among multiple generations of refugees, sexual decision making in US teens of South Asian descent, and urban development. They represent methodologies employed in a variety of disciplines – Public Health, Political Science, Film and Television Arts, and Religious Studies. This interdisciplinary symposium will showcase a range of South Asia communities and institutions as they collectively act to meet the challenges of a rapidly changing global environment.

Transferring Knowledge into Action: Examining the Impact of a Rural-Indian Adolescent Girls Intervention at the Individual, Family, and Community Level*

Griffin P. Barriss (Prof. Amanda Tapler) Department of Public Health Studies

The Comprehensive Rural Health Project (CRHP) in Jamkhed, India, uses the evidence-based "Jamkhed Model" to improve public health with existing community resources and interventions adapted to community values. A component of CRHP is the Adolescent Girls Programs (AGPs), which teach girls valuable lessons on the importance of education, women's health, and gender equality. AGPs aim to improve girls' quality of life, community participation, and sustainable community development. Resource restraints inhibited CRHP from researching AGPs' long-term impacts, and gaps in the academic literature exist on AGP graduates' community impacts globally. This collaborative project investigates how knowledge gained through AGPs impacts the lives of the graduates, families, and communities. Rooted in Community-Based Participatory Research, this study engaged community members as research partners to mitigate power dynamics and collaboratively identify important community issues. Twenty-five semi-structured interviews were conducted with AGP graduates aged 23-33, identified by convenience sampling, living in four CRHP-project villages, eight non CRHP-project villages, and three large cities. Prior to data collection, the Elon-CRHP Research Team hosted focus groups and piloted interviews to ensure effective phrasing of questions. Interviews were conducted, transcribed, translated into English by CRHP researchers, and sent to Elon University for coding. Findings revealed AGP graduates' knowledge retention and application at individual, family, and community levels. Graduates demonstrated strong agency, as 100% indicated "some involvement" in household decision-making and 57.7% indicated greater than 75% involvement in household decisions. Graduates used AGP lessons to reject dowry, pursue higher education, or start small businesses. Graduates expressed intentions to raise their children better than their mothers raised them, with gender equality and independence. 65.4% of graduates encouraged their children to finish school, and 100% planned to enroll them in AGPs. Graduates shared AGP lessons and values with family and community members to improve health status. More than half (54%) joined Women's Self-Help Groups (SHGs), some in leadership roles, and some started SHGs in their new communities. Findings show that AGP graduates are engaged community members and social entrepreneurs, providing evidence of the Jamkhed Model diffusing into rural Indian communities formally and informally and with long-term sustainable development success.

Cambodian American Religion in the United States*

Madison E. Gray (Dr. Brian Pennington) Department of Religious Studies

This study examines the current status of Cambodian religion in the United States as practiced by migrants and their descendants living in the American diaspora. The first substantial Cambodian communities in America formed in the late 1970s as waves of refugees fled the Khmer Rouge regime and the notorious Pol Pot. Early efforts to establish religion (typically Theravada Buddhism) in this unfamiliar context were met with significant challenges, chiefly the severe dearth of monastic leadership, who had been systematically eliminated in Pol Pot's attempt to eradicate religion in Cambodia. Today, however, we see a variety of thriving Cambodian American religious communities from Long Beach, CA to Richmond, VA. In communities such as these, the process of cultural preservation eventually ignited and took off (Chan, 2003). Robust heritage programs have developed in larger communities, which not only reaffirm ethnic identity but also encourage linguistic and cultural competency (Um, 2020). This paper sheds light on the complex religious landscapes that exist

today as a result of the efforts to rebuild and preserve Khmer heritage, especially among the younger Cambodian American generation. Survey instruments and socially-distanced interviews were employed to reach people who identify as Cambodian or ethnically Khmer from across the country. These tools were designed to address questions of identity, religious belief and practice, temple community, Cambodian American culture, and the persistence of Cambodian folk ritual in the US. Survey results show Khmer Americans have significantly transformed the religious ideas of their parents and grandparents in ways that challenge existing scholarship about this community. Trends potentially indicate a larger cultural change surrounding Khmer religious ideas: the emergence of a new religious landscape characterized by Cambodians who increasingly identify as Christian or not-religious and an orientation towards religious belief and practice that has shifted towards the exclusivity more typical of the US religious landscape. Findings provide insights into the specific beliefs, practices, ideas, and religiosity of today's Cambodian Americans, illustrating the homogenization taking place in the US context and the growing number of religious "nones" among Cambodian-Americans.

Bollywood and its Indian-American Audiences

Annabelle Baker (Dr. Brian Pennington) Department of Religious Studies

My research examines the role Bollywood plays in cultivating cultural connection to the homeland within the Indian diaspora, specifically the diaspora in the USA. There are few scholarly studies on this aspect of Bollywood, which is a signifier for Hindi-language movies produced in India. My presentation draws on the more than 80 responses that I received to the survey that I developed and disseminated on multiple Indian-American social media platforms and Bollywood fan-sites. The survey included questions about Bollywood's relationship to culture, religion, and identity, and asked respondents to name specific examples of films that do and do not represent Indian culture well. My findings reveal that Indian film-watchers in the USA participate in various kinds of social and cultural relationships with Bollywood film, and there is no strong consensus on whether Bollywood films are an accurate representation of Indian culture. Many of my respondents answered that Bollywood films are influential in continuing to provide a cultural connection with their homeland (and with other Indian-Americans), but others said that they find Bollywood films alienating and an unrelatable representation of Indian culture. When asked to name specific examples of movies that accurately represent Indian culture, more than 50% of respondents identified at least one movie centered on diasporic Indian stories. The majority of responses claimed that these movies were accurate depictions of Indian culture because of the familial relations portrayed in them, primarily between children and parents, but also between husbands and wives. Other responses identified the very same movies as poor representations of Indian culture, but supplied different reasons. Numerous respondents critiqued the patriarchal themes present in Bollywood films, and named instances in which they appreciated subversions of that patriarchy. Most of them indicated that they do not consider Bollywood films as relevant to religious experience, but many mentioned religious stereotypes found in Bollywood films, especially towards Islam. The dichotomies and contradictions in these survey responses shed new light on the culturally reciprocal relationship between the Indian-American diaspora and Bollywood film.

Investigating the Asian Infrastructure Investment Bank's "Best Practices" Commitment in Project Transparency and Accountability

Lily J. Sandifer-Stech (Dr. Jason Kirk) Department of Political Science & Policy Studies, International and Global Studies Program

The Asian Infrastructure Investment Bank (AIIB), a Chinese-led multilateral development bank, opened in 2016. The AIIB claims to uphold global best practices in mitigating environmental and social impacts of its projects, and in its own transparency and accountability, and hence has established its Environmental and Social Policy and Project-affected People's Mechanism. The limited literature on the AIIB mainly addresses its financial impact in Asia and beyond, its soft power potential for China, and its governance structure. While there is a specialist literature on transparency and accountability for the World Bank and established regional development banks, similar literature analyzing AIIB operations is only beginning to emerge, and this study fills this gap in the scholarship on the political economy of multilateral development banks. It provides a comparative case-study analysis of three AIIB projects in India: one co-financed with the World Bank (Amaravati Sustainable Capital City Development Project), one previously funded by the World Bank but later taken up independently by the AIIB (Mumbai Urban Transport Project), and one AIIB standalone project (Andhra Pradesh Urban Water Supply and Septage Management Improvement Project). All three projects are categorized as environmentally and socially high impact, particularly in their land acquisition and resettlement components. The first two were both subject to complaints to the World Bank Inspectional Panel. The study seeks to understand the AIIB's actions and to investigate its claim of upholding established best practices in social and environmental impact mitigation. As the AIIB is led by nondemocratic China, this study also aims to understand whether the AIIB is susceptible to the kinds of civil society pressures experienced by the American-led World Bank in the case of India, itself a democracy with strong activist traditions. Qualitative data will be collected through process tracing in the form of project staff interviews, media sources, external reports, official documents of the AIIB and World Bank, and government documents on the selected project. Preliminary results indicate that AIIB so far has largely followed the World Bank's lead in transparency and accountability, but questions remain about its independent capacities as it shifts from primarily co-financed to standalone projects.

South Asian, College-Aged Women and the Influence of Religion and Cultural Factors on Sexual Decision Making*

Srija Dutta (Prof. Amanda Tapler) Department of Public Health Studies

This study analyzes the role that religion and cultural factors play in shaping sexual knowledge, attitudes, behaviors, and autonomy of college-aged, South Asian women. It's well documented that religious factors can shape the development of sexual identity and decision-making among adolescents. Current research on South Asian students doesn't include the diasporas of South Asian women, nor consider ways in which their sexual identities have been shaped throughout their lives. This research provides an opportunity for South Asian women to explore factors associated with sexual development and autonomy. Sixteen South Asian women, enrolled in undergraduate institutions, participated in semi-structured interviews and focus groups. Potential participants were identified by peer and colleague connections, as well as the "snowball technique." Due to COVID-19, interviews and focus groups were conducted via Zoom. Religious belief and affiliation were explored in relation to sexual attitudes, behaviors, and sexual-decision making. Focus groups were used to gain a deeper, more comprehensive understanding of the themes and discrepancies unveiled by the interviews. These groups allowed participants to delineate the religious and cultural implications of their sexual decisions and engage with women who have had similar experiences. Findings indicate parental influence, degree of religious autonomy, and college culture play a significant role in sexual attitudes and decision-making of young South Asian women who participated in this study. 81% of participants reported growing up with parents who restricted their sexual expression. 85% indicated that college

provided an opportunity to learn more about human sexuality. Additionally, participants who had strong religious beliefs and who experienced religious stereotyping were more likely to articulate a lack of sexual autonomy. 73.3% of participants believed their college experiences positively influenced their sense of sexual autonomy.

Symposium II. Sustainability Across the Disciplines

The term "sustainability" is often aligned with the study of environment from the perspective of science (e.g., ecosystem degradation, pollution, wildlife habitat loss, etc.). However, the United Nations (UN) has identified three pillars of sustainability, which include the social and economic dimensions, alongside the environmental dimension. The UN's 17 Sustainable Development Goals, considered the blueprint to achieve a better and more sustainable future, nuance the issues connected to sustainability even further. They include such aims as quality education, sustainable cities and communities, gender equality, climate action, and responsible production and consumption, among others. Each student's research project diversely connects to at least one or more UN Sustainable Development Goals. Their coming together for an overarching themed symposium speaks to the necessity for cross-disciplinary conversations around sustainability, particularly in educating others about the broader implications of the term beyond its immediate associations. In her project "Identifying Trends in Hybridization Between Native and Invasive Species" Abigail Cates is researching species invasions that are redistributing plants and animals around the globe. Through qualitative interviews with young adults, Hannah Boone's project "Fear for the Future: Climate Change Activism" studies young people's understanding of climate change and its implications, their reactions to this understanding, and whether or not they are driven to act in response to this global phenomenon. Taylor McMartin's project, "Pathways and Barriers to Transitioning to 'Clean Meat' from Animal Agriculture", examines Elon students' perception of the current animal agriculture system and their opinions of "clean meat", otherwise known as cultured or in-vitro meat. And, in her project "Gender(ed) Matters in Nature-Based Education" Abigail Decker explores the role gender plays in nature-based learning, or the potential of nature-based learning to disrupt gendered norms. The "Sustainability Across the Disciplines" symposium unites the humanities, social, and natural sciences, and in reflecting many of the UN's Sustainable Development goals, it contributes to the complex discussions and necessary education that we need to do around sustainability as a broader, multi-disciplinary lens and cultural principle and practice.

Identifying Trends in Hybridization Between Native and Invasive Species

Abigail Cates, Sarah Hope Dolce, & Julia Needham (Dr. Amanda Chunco) Department of Environmental Studies

Invasive species have a large negative impact on native ecosystems and the biodiversity within. Harmful interspecific interactions between invasive and non-native species can result in severe population declines in native species. In particular, hybridization between an invasive species and a closely related native species can have a wide range of effects on native species, including population declines and genetic swamping. The rate at which species interbreed has accelerated over the last few hundred years due to human activity, especially climate change and species invasions. Identifying anthropogenically driven hybrid zones is crucial to mitigating the species decline. Here, we used a systematic literature review to identify 10x known hybrid zones between native and invasive species. We then determined biogeographic and taxonomic patterns in identified hybrid zones at a global scale. Analyzing global climate change patterns, routes of species invasions, and current species adaptions will make hybrid zone locations more visible and help identify the long-term outcomes of hybridization that are most likely for each species pair. This will be increasingly important in conservation planning.

"Coming Clean: Pathways and Barriers to Transitioning from Animal Agriculture to "Clean Meat"

Taylor McMartin (Dr. Robert Perdue & Dr. Muriel Vernon) Department of Sociology & Anthropology

“Clean meat”, otherwise known as cultured meat, is meat created via animal cell replication. Despite its novel nature, this innovative food technology has revolutionary potential. “Clean meat” production requires fewer resources such as land, water, and energy, creates less waste, and does not harm animals in the process, eliminating the damaging effects of factory farming on the environment, human health, and farmed animals. However, despite proof of concept and backers like Bill Gates and Tyson Foods, there is no “clean meat” product currently available on the market. Therefore, it is uncertain how consumers will react when confronted with the possibility of consuming “clean meat”. To rectify that lack of information, I undertook a mixed-methods survey design of Elon students. I selected students foremost for convenience and secondarily because young people tend to be more willing to try new technology. I began by doing 8 preliminary long-form interviews, with Elon students obtained via a convenience sample, to gauge what questions Elon students may have. Once I synthesized relevant information from the initial interviews, I used a Rolodex of Elon student emails that I have access to by virtue of being a student of the university, to create a stratified random sample for short-form surveys, with both multiple choice and short answer questions contained within. Participants were rewarded with a $5 gift card to one of five preselected stores - Irazu, Oak House, Tangent Tacos, Target, and Chipotle. These interviews, and surveys were used to illuminate the pathways and barriers to turning students into conscientious consumers through education regarding “clean meat”.

Fears for the Future: Youth Climate Change Activism

Hannah E. Boone (Dr. Jennifer Carroll) Department of Sociology & Anthropology

Climate change is an issue that disproportionately affects younger generations and has motivated many to participate in climate change activism. Previous research on political activism and social movements has focused on material resources as a motivation for action, leaving the importance of imagination and emotion as inspirations to act undertheorized. Chakrabarty (2009) provides a theoretical framework for understanding the emotional motivation to social action in his discussion of climate-change-affected futures that young people struggle to visualize and the anxiety this produces. Considering climate change activism through Chakrabarty's framework allows for the incorporation of imagination and emotion into classical social mobilization theories. The primary question pursued by the current study is how young people's imaginations of a climate-change-affected future shape their activism today. The methodological approach of this study includes semi-structured interviews with 25 young adults ages 18-25 to address what factors have motivated them to join the climate change movement. Learning about young people's perspectives on climate change is important because research has not yet been done on the topic, the climate crisis will affect them the most directly, and their participation in the movement will likely be a very important factor in its success.

Gender(ed) Matters in Nature-Based Education

Abigail M. Decker (Dr. Scott Morrison) Department of Education & Wellness

This presentation will overview a two-phase qualitative study of the ways in which gender is communicated, experienced, and constructed in nature-based education. Drawing from Frödén's (2019) *situated decoding of gender* and ecofeminist theory, we sought to explore the potential of nature-based education to serve as a tool for decoding gender and disrupting harmful notions of gender in students. The first phase consisted of semi-structured interviews with 20 environmental educators to understand their perceptions of the role gender plays in their work with children outside, while the second phase consisted of over 30 hours of fieldwork conducted in three nature-based learning spaces: one private outdoor preschool in the Northeast United States and two public elementary school garden clubs in the Southeast United States. In our analysis of the fieldwork data, we found that there were four main themes contributing to the construction or deconstruction of gender within nature-based education: the materials, or the tools, toys, and clothing; spaces, or the physical environments students learn within and move between; conversations**,** or the language used by and between students and educators outside; and educators, or the actions of teachers and other adults that respond to and influence student gender constructs. While much of our data suggested gender was being communicated and experienced differently outside—and perhaps gender norms even lessened—it was also concluded that educators must be intentional about curating and maintaining a gender-decoded learning environment. This is especially important as our interview responses reflected limited confidence from environmental educators to draw any conclusions about the role of gender in learning outside. To intentionally decode gender, educators must realize that gender is being constructed at school by and for children and realize the ways in which it is communicated and experienced. They must also recognize when gender constructions are harmful and when they must be disrupted, and must know how to respond both immediately and long-term to cultivate a gender-decoded learning environment.

Abstracts by Department/Program

Arts Administration

Curated Race on Instagram: Exploring Content Strategies of Art Museums in Racial Justice*

Jessica L. Cooper-Vastola (Dr. Wen Guo) Department of Arts Administration

This study utilizes visual framing theory to conduct a qualitative content analysis on the visual and textual components of Instagram posts generated by the Museum of Modern Art (MoMA) through the lens of Critical Race Theory (CRT) (Delgado & Stefancic 1995) in order to understand the performative actions against racism of art institutions. By using the MoMA as a case study, we have analyzed Instagram content posted by the museum between 4/25-7/25: a month before the death of Floyd, a month after, and a follow-up month in order to compare the change in Instagram posts. Five specific research questions will be explored: RQ1. What issues of social injustice emerge from the use of social media in art museums in general? RQ2. How were artists of color and their culture presented and represented by visual expressions and texts of MoMA's Instagram posts between April to July of 2020? RQ3. How did MoMA respond to the murder of George Floyd on Instagram? RQ4. How did the public of MoMA interact with its Instagram posts between April to July of 2020? RQ5. How does the investigation of the Instagram posts manifest museums' strategies in fostering critical conversations with viewers through social media? Based on the analytical approach of visual framing, we uncovered the institutional, individual, and accumulative racism through mediated imagery and text on Instagram as the interface between art and race. We find significant differences in posts of MoMA before and after the murder of Floyd in terms of the institution's reflection on institutional racism. However, the content of the posts and the way museums frame the dialogue between the institution and the public on racism is still problematic in the following ways: 1. The Instagram posts show a narrow scope of presenting black artists/artists in color in general; 2. White curators own the dominant power in presenting black artists; 3. MoMA's Instagram content is not a two-way communication that interacts with the public in conversations on racism.

Biology

Hybrid Lizards on the Dark Side: Does Liver Pigmentation Prevent Cellular Damage?

Eliza P. Boudett (Dr. Gregory Haenel) Department of Biology

Individuals with more melanin pigmentation in their skin are at less risk for skin cancers caused by ultraviolet radiation. Melanin is an antioxidant, indicating that it scavenges reactive oxygen species (ROS), preventing cellular damage. In previous studies it was observed that the livers of hybrid tree lizards (*Urosaurus graciosus* x *U. ornatus*) contained high levels of melanin compared to either parental type. Hybrids in addition to demonstrating higher levels of melanin also showed excess levels of ATP production, indicating higher levels of ROS. We hypothesize that melanin could play a similar role in the liver of these hybrid lizards to that of the pigment in the skin, protecting against DNA damage. The comet assay is a low-cost and highly replicable assay that was selected in order to examine its potential use for measuring DNA damage in liver cells, specifically in lizards. While the assay is widely being used by toxicologists in mammalian cells, the assay has not previously been used

in examining lizard tissue. To see if the comet assay could be used on lizard liver tissue, liver cells from Eastern Fence lizards were homogenized, treated with hydrogen peroxide to damage DNA, suspended in low melting point agarose, and applied to a microscope slide. Single cell gel electrophoresis was performed using an electric current, with damaged DNA migrating faster than unbroken DNA, causing a smear of DNA resembling a comet. DNA of cells not treated with hydrogen peroxide were used as controls, because they should not display damage, and not visibly migrate in the gel (no smear). After extensive optimization, we were able to successfully document damaged and undamaged DNA in lizard liver tissue. Major modifications included using a custom agarose spreader rather than a coverslip on the microscope slides, incubating samples on ice for 15 min instead of at 37°C, and changing electrophoresis conditions. Future studies can use this modified protocol to measure DNA damage in lizard liver cells with and without melanin when they are exposed to ROS damage. If melanin is acting as an antioxidant then cells with melanin should show less damage than those without.

Determining the Soil Seedbank in Elon University Forest

Austin K. Burnett (Dr. David Vandermast) Department of Biology

The soil seed bank is extremely important for subsequent generations of plants during secondary succession. However, with the addition of invasive species into these forests has caused a decrease in biodiversity as plants compete for limited resources. This study aims to look at the soil seed bank in Elon University Forest to determine the diversity of vascular plants and to determine the presence of invasive species, species not native to the Piedmont region, present in the soil. Soils from ten different plots were collected mid-autumn and placed in pots to allow the seeds within the soil to grow. The pots were kept in a greenhouse where they were under normal daylight hours and the soils were watered as necessary. Once plants had grown to a size where they could be identified, they were removed from the pots and the soil was remixed to facilitate the germination of other seeds that might be in the soil. We found that there was a large presence of invasive species within the soil seed bank. These results suggest that invasive vascular plants will continue to be a potential problem by lowering diversity in Elon University Forest.

Modeling and Investigating the Molecular Basis of Tay-Sachs Disease

Melissa B. Denish (Dr. Tonya Laakko Train & Dr. Kathryn Matera) Department of Biology

Tay-Sachs disease (TSD) is a rare but fatal disorder that disproportionately affects the Ashkenazi Jewish population and results in progressive neurodegeneration. Patients with TSD have lower levels of an enzyme, hexosaminidase-A (Hex-A), which causes a neuronal lipid (GM2) to accumulate in brain cells. There currently is no cure for TSD, and the molecular basis of this disease is not fully understood. This project aims to investigate TSD with a cell culture model, by re-creating TSD in a neuroblastoma cell line using a technique called RNA interference to reduce Hex-A levels. Human neuronal cells were incubated either with, or without (in a control sample), interfering RNA in order to reduce levels of Hex-A. Relative Hex-A protein levels were determined by Western Blot analysis using GAPDH as a total protein control, and preliminary experiments indicate that the TSD model had a 68% reduction in the level of Hex-A expression as compared to non-treated cells. These preliminary results will require future experiments to investigate whether this enzymatic decrease also results in increased GM2 accumulation in the TSD cell culture model.

Monitoring Changes in the Composition and Structure of Vegetation in Elon University Forest Over 10 Years

Hannah A. Durkin (Dr. David Vandermast) Department of Biology

Elon University Forest (EUF) is a 56-acre teaching and research forest that contains a patchwork of forest ages ranging from about 45 years to a never clear-cut woodlot with trees exceeding 250 years. The varying ages across EUF, caused by 18th and 19th century farming practices, make it an ideal location for forest successional studies. During the last 10 years, the majority of the forest composition research on EUF has involved sampling permanent 20 x 50 meter plots, a standard way of measuring forest succession. Although the permanent plots are located in different forest types, characterized by dominant vegetation and apparent successional stage, they do not necessarily accurately represent the entirety of vegetation in EUF. To provide a more thorough picture of the changes to EUF through time and space, the present study uses prism cruising, a non-permanent sampling technique that was utilized on EUF in 2010 to cover a greater area more quickly. The results from the present study were compared with data from the baseline 2010 cruise and with successional changes documented in permanent plots from 2010 and 2018. Using the non-permanent sampling method, we found greater *Pinus virginiana* (Virginia pine) and *Pinus echinata* (shortleaf pine) dominance that was not represented by the permanent plots. This pine dominance was expected for an early-successional forest like EUF, and it supports the prediction that prism sampling provides a different structural understanding of the forest. Additionally, gradual successional changes in EUF from 2010 to 2020 were evidenced in the non-permanent sampling method as shortleaf pine dominance decreased and *Liquidambar styraciflua* (sweetgum), *Quercus stellata* (post oak), and *Quercus alba* (white oak) dominance increased. Transitions in the dominant species at each time period indicated by both sampling methods suggest that EUF forest composition, especially its younger successional stands, is in a continual state of change.

Investigation of Medicinal Properties of Crassocephalum crepidioides

Sophie Erlich (Dr. Linda M. Niedziela) Department of Biology

The Vietnamese Montagnard community of Greensboro, North Carolina, has been ingesting *Crassocephalum crepidioides* due to its resemblance to a medicinal plant native to Vietnam. The plant contains alkaloids, which might benefit learning and memory function in older adults. This research investigated the biochemical and behavioral effects of *Crassocephalum crepidioides* to further understand its potential function and the strength of its impact. Plants were grown from seed in Elon's greenhouse, and the leaves were air-dried. Upon performing the Ellman enzyme activity assay, it was found that an aqueous decoction of dried leaves significantly inhibited ($p = 0.034$) the enzyme acetylcholinesterase (AChE) when compared to solvent control. AChE helps maintain the homeostatic state of acetylcholine in the body, which is a compound involved in neuron connection and memory function. If the enzyme is inhibited, levels of acetylcholine increase, and this has been hypothesized to compensate for lower levels in older adults. Older zebrafish were exposed to 1000 ppm of the extract in their tank water for one week and then trained for three days by stirring with a rod as negative reinforcement until they swam to the correct arm of a T-maze. After 24 hours, the learning ability of the fish was tested by observing if they chose the correct arm without use of reinforcement. Memory was assessed by testing the fish every 48 hours until they no longer chose correctly. Fish treated with 1000 ppm extract had a statistically significant increase ($p = 0.018$) in the number of days they correctly completed the task. Treated fish remembered an average of 16 days compared to control fish

at 5.6 days. These results, if they hold up to further analysis, may open up possible avenues for drug development for treatment or prevention of cognitive decline in the elderly.

The Gut Microbiome and its Influence on Hormones and Fertility in Zebrafish

Grace M. Garrett (Dr. Jennifer K. Uno) Department of Biology

One in eight couples of reproductive age will experience difficulties conceiving and having children. A woman's fertility is largely contributed to by estrogen production. Recent research indicates that the composition of the gut microbiome may contribute to estrogen levels and thus play a role in reproductive health and fertility. However, currently there is little to no work connecting the microbiome to the hormonal imbalances associated with infertility. This study investigates the effects of gut microbiome modulation on hormones in the hypothalamic-pituitary-gonadal (HPG) axis and fertility, including estrogen and gonadotropin-releasing hormone (GnRH). GnRH is responsible for signaling from the hypothalamus to the pituitary gland to induce production of hormones which stimulate the gonads and sex hormone production. Total bacterial DNA in the gut, expression of GnRH receptor, and expression of estrogen receptor were examined via qRT-PCR in three groups of fish. The fish were either untreated, antibiotic-treated with zero-day reacclimation period, and antibiotic-treated with 14-day reacclimation period. The reacclimation period was to provide time for the intestinal microbiome to recolonize following antibiotic treatment. There was over a 50% reduction in bacterial abundance in antibiotic treated fish ($n=4$, $p< 0.05$) compared to those untreated. In females, this corresponded to a 17-fold increase of GnRH expression in antibiotic treated fish with a 14-day reacclimation ($n= 6$, $p< 0.05$) while estrogen receptor expression showed no significant differences in any groups. Collectively, these data indicate the gut microbiota may play a role in modulation of the HPG axis, thus potentially influencing fertility in zebrafish.

Investigation of Senolytic Molecules in SH-–SY5Y Neurons

Sean R. Janovic (Dr. Tonya L. Train) Department of Biology

Neurodegenerative disease (stroke, Alzheimer's, Parkinson's) is the third leading cause of death in the U.S. behind only heart disease and cancer. A possible contributing factor to the onset of age-related neurodegenerative disease is the accumulation of senescent cells in the brain. Cellular senescence is irreversible cell cycle arrest that protects against cancer and aids in development and tissue repair. New insights indicate the negative impacts of senescent cells as they accumulate in tissue with age, yet little is known about the role of senescence in neurodegeneration. Recent studies have identified molecules, termed senolytics, that selectively induce death of senescent cells. The senolytics, fisetin, and the combination of dasatinib and quercetin, increase healthspan and lifespan in mice and are now under clinical investigation. Despite these advancements, a limitation of senolytics is their inability to induce death of senescent cells across cell types. Due to this specificity, each cell type requires investigation to find effective senolytics. This study aims to investigate senescence and senolytic molecules in SH-SY5Y human neurons. Senescence was measured by colorimetric Beta-galactosidase staining and senolytic activity was measured by flow cytometry with annexin V and propidium iodide. Fisetin was not found to display senolytic activity in D-galactose-induced senescent neurons. Experiments applying dasatinib, quercetin, and their combination in etoposide-induced senescent neurons are ongoing. The present study, and others looking at senolytics in neurons and glial cells, aim to determine the most effective senolytics to be applied in studies of neurodegenerative disease in model organisms.

Multiple Functions for Multiple Signals: The Role of Sound and Vibration in Mediating Courtship and Competition in a Neotropical Katydid

Jean Ross, Madi Gamble, Ciara Kernan, & Hannah ter Hofstede (Dr. Jen Hamel) Department of Biology

Animals use mating signals to locate potential mates, assess their quality, and compete with other signalers for access to mates. More than one type of signal may be produced during these interactions, and the intended receivers of different signals are not always obvious, particularly when signaling occurs across multiple sensory modalities. For example, male and female Neotropical katydids (*Docidocercus gigliotosi*) perform duets using vibrational signals (tremulations) prior to mating, and males also produce airborne signals (calls). To determine how each signal type functions in inter- and intrasexual interactions, we quantified behaviors of male and female *D. gigliotosi* during playbacks of both signal types and control stimuli. Playback stimuli were signals from conspecific males, heterospecific males, and silence. We also observed male behavior during playback of female tremulations. Compared to control stimuli, females tremulated and walked more during both calls and male tremulations, and some females located the sources of both these signals. Both sexes tremulated more during playback of tremulations from conspecifics of the opposite sex than those from heterospecifics. Across treatments, males tremulated more in response to signals of the opposite sex than did females, and females walked farther than males. Finally, males called and tremulated more in response to conspecific calls compared with heterospecific male signals or silence, but male responses to male tremulations did not differ across treatments. We conclude that some shared function exists between the two *D. gigliotosi* signal types, as each modality is sufficient for a female to locate a nearby signaling male, and also that males and females can distinguish between calls and tremulations from different species. Additionally, males appear to increase their signaling effort when competing with a signaling conspecific male. Our findings provide a clearer understanding about how multimodal signaling mediates the complex processes of mate finding and competition for this species.

Investigating the Effect of a High Salt Environment on HER2+ Gastric Cancer Cells through SIK3 Protein Activation

Kevin M. K. Scott (Dr. Yuko Miyamoto) Department of Biology

Gastric cancer is one of the leading causes of cancer deaths worldwide and is prevalent in East Asian countries, which are known to have high salt diets. The HER2 protein, which is often overexpressed in gastric and breast cancers, plays an important role in signaling for cell growth and proliferation in breast cancer. Previous data suggest that both the HER2 protein and high salt diets are factors in gastric cancer cell growth, but there is limited information for the relationship between the HER2 protein and salt in gastric cancer. This research determined the effects of different salt environments and varying FBS growth factor levels on gastric cell growth and the effect on HER2 expression in gastric cancer cells (NCI-N87). The NCI-N87 cells were cultured in varying conditions of NaCl (0.01, 0.05, and 0.1 M) solutions with varying levels of FBS (5% and 10%) for one week. Western blot analysis revealed that control, 0.01, and 0.05 M salt (NaCl) solution had similar HER2 expression levels across FBS conditions as well. Cell concentration levels were highest in 0.01 M added salt and 5% FBS ($p=0.05$) and was significant in comparison to all other conditions ($p=0.05$). The NCI-N87 cells had the lowest viability levels in the 0.1 M condition, demonstrating that the highest salt concentration is cytotoxic. Changes in salt concentration and FBS growth factor levels will continue to be investigated in acute

exposure to learn more about how the environmental changes affect HER2 and SIK3, a protein activated by salt, in gastric cancer cells.

The Protective Role of S. Epidermidis Against Skin Cancer Across Various Demographic Groups

Nicholas Urbanski (Dr. Jennifer Uno) Department of Biology

Skin cancer is the most common type of cancer, with melanoma skin cancer predicted to affect close to 100,000 people in 2021. Research indicates the skin microbiome may play a protective role against the development of skin cancer. The skin microbiome is home to communities of bacteria, fungi, and viruses. These microbes are known to play both a mutualistic and pathogenic role in human health. Recent studies in mice revealed the commensal bacteria *S. epidermidis* can prevent skin cancer through the production 6-N-Hydroxyaminopurine (6-HAP), a molecule demonstrated to attack tumor cell lines. *S. epidermidis* can protect against skin cancer, however it is unknown if its effects are similar in all demographics. The aim of this research is to further explore and identify the levels of *S. epidermidis* across different demographic groups on Elon's campus and determine the best methods for collecting and examining microbial populations from skin. In order to test this, various sampling and extraction methods were performed. In addition, the presence of *S. epidermidis* will be examined among Elon University students and correlated to the national rates of skin cancer among different demographics. Participants' skin was swabbed using either a wet or dry prep. Following collection, different isolation methods were used following manufacturer's protocol. Results indicate that wet prep using Qiagen based kits were more efficient at isolating DNA (n = 6) with bacterial DNA being isolated for all participants. PCR analysis was used to confirm the presence of *S. epidermidis*. Data from this project will aid the field of skin cancer research in a time of elevating cancer rates.

The Effects of E-cigarette Toxins on the Behavior of Adult Zebrafish

Ryan A. Wagner (Dr. Eric Bauer) Department of Biology

The ever-increasing popularity of electronic cigarette products has led to an ongoing debate as to whether or not these devices are actually safe. Many of the chemicals that are contained in these products do not have sufficient research to determine the effects when inhaled. While there is research regarding the effects of nicotine and chemical byproducts of burning cigarettes, little is known of the effects of inhaling the additive chemicals found in e-cigarette fluids. The current devices on the market can also contain nicotine levels as high as a pack of cigarettes, revamping the popularity of smoking as it was declining. Due to the emergence of vaping-induced lung damage, there has been an increase in the desire to further research the effects of e-cigarette additive chemicals when inhaled. This project used zebrafish, Danio rerio, as a model organism to examine the effects of nicotine and other vaping device chemicals on behavior. Zebrafish have relatively similar brain structures to humans, due to the fact that they are vertebrates. The fish were used in a multi-week experiment where the organism was measured pre- and post-exposure, utilizing a stimulus to evaluate any potential effects nicotine could have on the behaviors exhibited. Because an animal's behavior is created by their brain, any changes we saw in behavior were likely due to changes in brain function. A stimulus (partition raise, revealing a novel marble to the fish) was utilized to incite potential changes in fish behavior as the fish established a level of comfortability within the testing apparatus. The effects of nicotine exposure on the behavior of zebrafish were analyzed through motion tracking software (EthoVision XT). The software monitored their swimming speed, location in tank and changes in motion over time. Initial

findings have shown that fish exposed to nicotine tend to swim faster and farther (on average) after the partition has been raised compared to untreated fish. These behaviors are indicative of increased stress and anxiety in the fish, and further testing could further reinforce these observations.

The Toxicology of the Trumpet Vine (Campsis radicans)

Katie T. Zinke (Dr. Linda Niedziela & Dr. Catherine Bush) Department of Biology

This research investigates the plant *Campsis radicans* in order to determine if it is toxic. A Vietnamese immigrant population, the Montagnards, collect and consume large quantities of *C. radicans* within their community in Greensboro, North Carolina. The Montagnards recognize that *C. radicans* shares characteristics with *Oroxylum indicum*, a plant native to Vietnam. Both species have similar colorful, cone-shaped flowers. Botanically, both are in the *Bignoniaceae* family, but fall into different tribes so they are not as closely related as the Montagnards perceive them to be. There is very limited research on *C. radicans* as a species; however, it is suspected that there are toxic compounds present in the species. With this potential toxicity, this research performed a standard preliminary toxicity assessment of *C. radicans* using *Daphnia magna.* Aqueous extracts from the flowers and leaves were prepared through two methods: boiling and cooking. Daphnia were exposed to the extracts of boiled leaves, boiled flowers, cooked leaves and cooked flowers plus water as the control. Three replicates of 6 daphnia per 5 cm well were exposed to 10 mL of a range of extract dilutions. Mortality was measured every 24 hours for a total of 192 hours. Additionally, embryos of the vertebrate model organism, *Danio rerio* were exposed to leaf extracts and observed for developmental changes. The results show a dose-response relationship between the leaf extract dilutions and the daphnia mortality rate. Dilutions of 100%, 10% and 1% were significantly different from the control in the boiled leaf extracts and dilutions of 100% and 10% were significantly different in the cooked leaf extracts. The boiled leaf extract and the cooked leaf extract were significantly different with a p-value 0.014, suggesting boiling is more toxic than cooking. The boiled leaf extract and the boiled flower extract were significantly different with a p-value of 0.019, suggesting the leaves are more toxic than the flowers. Within the vertebrate model, there was repeatable premature hatching, as well as unhatched embryos. While this study was not completed on humans it does suggest there are biologically active compounds which have toxic potential.

Center for Design Thinking

Impact of Design Thinking Within the Classroom: A Cross-Institutional Pedagogical Study

Margaret E. Cox, Megan Casner, & Mikayla Ford (Dr. Danielle Lake) Department of Interdisciplinary Studies

Design Thinking (DT) has recently become a popular method for supporting collaborative problem-finding and solving projects in the business, non-profit, government, K-12, and higher education sectors. Studies designed to assess its value as an effective method for social innovation are now emerging. So far most studies have focused on case studies or return on investment metrics. This mixed methods study examines the various ways DT is being taught at four major universities in North Carolina and compares findings across academic disciplines and experiences levels with DT. This study evaluates how faculty from 21 different courses across these institutions that teach design thinking, and the outcomes the students and professors observe in relation to DT curricular practices. The study examined DT practices from business, engineering and design, and interdisciplinary

humanities/social studies courses. This study is mixed methods, consisting of a survey and a series of semi-structured interviews with faculty and students. Participants completed a ten minute likert-scale survey that assessed DT practices and outcomes and then, some participated in an optional semi-structured follow-up interview. Preliminary findings suggest that DT within higher education can lead to two main outcomes: increased confidence within students' problem identifying and solving skills, and a deeper focus on empathy and human-centered design. Additionally, DT was shown to be a useful tool for supporting collaborative, project-based and problem-based learning. It was found that DT within the classroom can lead to improved team formation and functioning. Interview participants also revealed that teaching DT can be fraught with challenges related to the messy nature of the DT process, and the traditional academic structure of higher education, such as time and continuity between semesters. Survey and interview findings also revealed that DT challenges students' to jump into a new way of thinking and solving problem.

Chemistry

Determination of Trace Metal Content in Cigarette Butts

Anna C. Altmann (Dr. Justin Clar) Department of Chemistry

A substantial amount of research has addressed the environmental impact of nicotine from cigarettes and cigarette butts (CBs) on human and environmental health. However, very little research has involved studying the trace metals found inside tobacco and cigarettes and their impact on human and environmental health. Previous studies on the release of trace metals from CBs have not determined if CBs are a source or sink for trace metals in the environment. This research seeks to address that confusion by developing a baseline of trace metals content in CBs before subsequent environmental release studies. In Phase 1 of this project, a mass balance was completed to determine how much metal was found inside each component (paper, tobacco, filter) of an unsmoked cigarette. The cigarette components from six brands were digested with hydrochloric acid and nitric acid using EPA method 3051A before metals analysis with Inductively Coupled Plasma – Optical Emission Spectrometry (ICP-OES). The metals found in the paper varied by brand, but the metal in the highest concentration in five of the six brands was iron (~300 µg/Cig). The metals measured in the tobacco samples were higher than that of the paper or filter. Specifically, the metal found in the highest concentration inside tobacco samples from every brand was magnesium. Phase II of this study will use laboratory produced CBs through simulated smoking to test their ability to leach trace metals from the CB into received water bodies. Test fluids will include DI water, simulated precipitation, and natural water samples. We hypothesize metal release will be primarily driven by test fluid pH. Currently, this research is tracking trace metal mobility from the tobacco to the filters through artificial smoking.

Development of a Lab to Improve Student Understanding of the Photoelectric Effect and its Implications

Nathan D. Blohm (Dr. Anthony Rizzuto) Department of Chemistry

The photoelectric effect was originally discovered in 1887 by Heinrich Hertz and Albert Einstein's contributions to explaining the effect led to his 1921 Nobel Prize. Explanation of this phenomenon has significantly contributed to a shift in understanding of both chemistry and physics. Theories evolved from the photoelectric effect have led to the wave-particle duality of light model, opened research into subatomic particles and quantum theory, and advanced electronics, and has drastically improved our

understanding of both fundamental chemistry and analytical methods. Despite the importance of the photoelectric effect, the topic is often only briefly mentioned or overlooked entirely in introductory chemistry courses and while its theories are discussed in upper-level Physical Chemistry, it is rarely explored in detail in the associated lab. As a result, undergraduate chemistry students often lack sufficient understanding of the concept and its implications. The purpose of this research is to develop a modifiable photoelectric effect apparatus and accompanying lab procedure for undergraduate students to perform in order to improve their understanding of the photoelectric effect and its implications. Unlike traditional photoelectric effect apparatuses which are effectively "black boxes" (i.e., all of the components are encased and untouchable), this apparatus will have all the components visible, accessible, and modifiable for hands-on learning. Students will be able to manipulate the anode, cathode, incident laser light, vacuum chamber, and even the electrical components. Future stages of this research will involve assessing students' improvement in understanding of the material and its implications.

Investigating the Efficacy of a Rhodium-Centered Complex as a Catalyst for the Electrochemical Reduction of Carbon Dioxide

Lauren O. Butler (Dr. Karl D. Sienerth & Dr. Anthony Rizzuto) Department of Chemistry

Greenhouse gas emissions have a serious impact on the environment and climate, with carbon dioxide being one of the largest contributors due to how long it persists in the atmosphere. One way to combat the problem of excess atmospheric carbon dioxide would be to decrease emissions by repurposing carbon dioxide. This could possibly be accomplished by electrochemically reducing carbon dioxide and subsequently converting it into other chemical compounds, such as methane and methanol, which could then be used for the production of fuels and industrial chemicals. Due to the high stability of carbon dioxide, electrochemical reduction needs to be catalyzed to make it energy-efficient, and much of the research in this area focuses on determining what materials are effective catalysts. Although some materials have shown potential, there are still many issues with current catalysts including low efficiencies, low product selectivity, and high input of energy required. This research seeks to determine the efficacy of an organometallic complex, $[Rh(bpca)_2]^+$, for the electrochemical reduction of carbon dioxide. To date, $[Rh(bpca)_2]^+$ has been synthesized and characterized using Fourier-transform infrared (FT-IR) spectroscopy and nuclear magnetic resonance (NMR) spectroscopy. Electrolysis experiments have been conducted in the presence of carbon dioxide, $[Rh(bpca)_2]^+$, and benzyl chloride. When carbon dioxide is reduced it becomes a highly reactive radical species and reacts with benzyl chloride to form phenylacetic acid. Future work will determine the amount of carbon dioxide reduced via gas chromatography-mass spectrometry based on the amount of benzyl chloride converted to phenylacetic acid. Efficiency of the reaction will be determined based on the amount of carbon dioxide reduced per unit of charge applied during the reaction.

Synergistic Effects of Anti-Cancer Drug Administration on Acute Myeloid Leukemia

Margaret A. Canavan (Dr. Victoria Del Gaizo Moore) Department of Chemistry

Acute Myeloid Leukemia (AML) is a malignant disease that has had high rates of chemoresistance, or drug resistance, in patients, which is the main cause of treatment failure. The goal of this project investigates the potential synergetics effects of a glucose inhibitor (WZB117) on chemoresistant AML cells as an alternative method for treatment of AML. MOLM-13 cells, which is an AML cell line, are being used to determine the cytotoxic effects of chemotherapeutic agents and WZB117 on drug

resistant AML cells. Currently, baseline sensitivity to WZB117 is being evaluated and chemo-resistant cells are being grown. Once resistant cells are ready, they will be treated with WZB117 alone or in combination with other drugs and the amount of cell death induced will be quantified. Understanding the effects of WZB117 on drug resistant AML cells could expand options for AML patients with high risk of remission.

Assessing the Effects of Climate Change on the Release of Metals into Agricultural Products

Hayley Clos (Dr. Dan Wright) Department of Chemistry

Agriculture is a key development in human life that allows for the production and distribution of food. Impacts due to climate change can have negative effects on agricultural processes. Current research has tied increased metal uptake in fruits and vegetables to increased temperatures, though not specifically associated with climate change. Certain trace metals such as lead and arsenic have been shown to pose health risks to humans. The uptake of trace metals into produce can be monitored using inductively coupled plasma (ICP) and X-ray fluorescence (XRF) spectroscopy. The current research begins a 5 to 10-year longitudinal study to analyze how changing temperature affects the amount of trace metal uptake in local produce from states along the Atlantic coast. Measurements will be made with ICP spectroscopy in order to compare and verify the measurements collected from the XRF. XRF spectroscopy is the preferred method of analysis due to the fact that it is greener, faster, and more cost-effective than ICP analysis. Preliminary data comparing the two techniques will be provided.

Analysis of Trace Metal Content in Cannabidiol Products

Mylashia G. Cross (Dr. Justin Clar) Department of Chemistry

As more states legalize cannabidiol (CBD), its usage is becoming more widespread across consumers of all ages, as a natural alternative treatment for pain, anxiety, and insomnia, among other conditions. Despite its prevalence, many questions remain about the long-term health effects of CBD usage based on varying levels of regulation and enforcement between states. To understand these potential long term health effects, CBD products, specifically hemp flowers, were analyzed for their trace metal content. The analysis process consisted of sample preparation using microwave assisted digestion, which converts solid substances into liquid using acid. After digestion, samples were analyzed for trace metal content via inductively coupled plasma optical emission spectroscopy (ICP-OES). A series of hemp flower samples were selected at various price points to assess metals exposure based on product quality. ICP analysis detected the presence of magnesium, calcium, iron, potassium, barium, rubidium, zinc, sodium, strontium, copper, manganese, and aluminum in all samples. Analysis findings indicate a clear correlation between product cost and trace metal concentrations. Specifically, higher concentrations of trace metals were found in the least expensive products sampled. Future analysis will continue to evaluate the correlation in product price and trace metal loading through sample collection of CBD flowers from multiple states and vendors. Finally, future studies will track transfer of trace metals in hemp flowers to the end user via artificial smoking and ash analysis.

Investigation of the Structural Properties of Vanadium-Tetracycline Complexes

Samantha E. Eastman (Dr. Jen Dabrowski) Department of Chemistry

Bacterial resistance to antibiotics has become increasingly prevalent in the modern age, necessitating the discovery of new antibiotic compounds. One approach being explored to combat these pathogenic organisms is molecular complexes containing organic compounds bonded to metal atoms. Many metal atoms exhibit similar structural characteristics to nonmetal atoms; one example is the metal vanadium, which has similar bonding properties to phosphorus. These structural feature similarities allow for the substitution of metals in different compounds. The presence of organometallics in medicine is not new and in recent studies, vanadium has been used in therapeutic drug development for diabetes. By creating a complex between metals and antibiotics, the molecular structure may be altered in a manner in which the compound is able to bypass the evolved mechanism of antibiotic resistance. Previous research in the group has shown that the combination of vanadium with the antibiotics tetracycline and erythromycin does not inhibit their antibacterial properties. However, the exact structure of the compound formed is not known. The aim of this research is to characterize the complex that is synthesized when vanadyl (IV) acetylacetone is reacted with the antibiotic tetracycline. Several methods of chemical analysis have been utilized in the attempt to elucidate the molecular structure including infrared and UV-Vis spectroscopy, as well as ^{1}H and ^{13}C nuclear magnetic resonance spectroscopy. Preliminary results suggest the successful synthesis of a vanadium-tetracycline complex.

Kinetic Investigations of NOx Chemistry Pertaining to the Global Nitrogen Cycle

Daniel J. Heintzelman (Dr. Anthony M. Rizzuto) Department of Chemistry

Nitrogen containing compounds (NOx compounds) are of central importance to the global nitrogen cycle and the reactions in which they participate significantly impact many atmospheric processes and even influence global climate change. The decomposition of HNO2 is likely to lead to the production of nitrogen radicals leading to ozone depletion. Despite this, the kinetics of many of the NOx reaction pathways remain incompletely understood. Of particular interest is nitrous acid (HNO2) and the multitude of atmospheric reactions in which it participates. Specifically, the rate of decomposition of HNO2 under atmospheric conditions and in aerosol particles is largely unknown. This project aims to detail the kinetics of the reactions involved in the decomposition of aqueous HNO2 using UV-Vis spectroscopy. We show that the decomposition of HNO2 occurs via either first- or second-order reaction kinetics depending on the initial HNO2 concentration in solution. This result implies the decomposition proceeds through two different mechanisms – a first order mechanism at low concentrations (< 50 mM) of HNO2 and a second order mechanism at high concentrations (> 200 mM). The measured rate constants for the low and high concentration regimes were found to be 0.0029 s-1 and 0.00022 L mol-1 s-1 respectively. Future studies will be conducted to elucidate the specific molecular mechanisms by which nitrous acid decomposes in the two concentration regimes.

Enzyme Kinetics of Thyroid Peroxidase and Characterization of Oxidized Substrates

Haileigh Houser (Dr. Kathryn Matera) Department of Chemistry

Polycystic Ovarian Syndrome (PCOS) is a female reproductive endocrine disorder that affects ovarian function. Though the cause of PCOS is unknown, there is an association between infertility as a result of PCOS and the presence of thyroperoxidase (TPO), a thyroid enzyme. As estrogen levels can be elevated in patients with PCOS, this study investigates the oxidation of the estrogen derivatives (estradiol, ethynylestradiol 3-methyl ether, and 17-A ethynylestradiol) through TPO oxidative activity, potentially resulting in cytotoxic compounds. Using UV-Vis spectroscopy for enzyme kinetics studies and thin layer chromatography (TLC) to determine presence of novel oxidative products, evidence of

hormone oxidation through peroxidase enzymes was shown. Analysis of nuclear magnetic resonance (NMR) spectroscopy was unable to clearly identify the structure or structures of the resulting oxidized compounds. Further optimization of these spectroscopic methods will provide additional information to determine the actual oxidized hormone structures which potentially affect PCOS-associated infertility.

Assessing the Release and Transformation of Metal Additives from Consumer Plastics

Margaret H. Hughes (Dr. Justin Clar) Department of Chemistry

The use of consumer plastic spans a very broad range, including electronics, food packaging, and even clothing. Many plastics contain trace metal additives, which are potentially toxic to humans and the environment. Trace metals are often added to plastics to reduce degradation and/or discoloration, as well as to increase strength and flexibility. For example, polyvinyl chloride (PVC), commonly used in piping, is specifically known to contain large amounts of tin (0.5 – 2 wt%). Previous research has investigated the release of tin compounds from PVC piping under bench-scale flow systems. However, these studies do not address other exposure routes, including inhalation of secondary particles produced during PVC construction activities (cutting, sanding, grinding, etc.). In this study, leaching of elemental tin and organotins was tracked during simulated construction activities that included sanding and grinding of PVC tubing to generate different sized fractions (>25 microns, >75 microns, and >250 microns). The different fractions were then incubated for two weeks in a variety of synthetic biological fluids and the release of tin from these particulates was tracked using inductively coupled plasma optical emission spectrometry technology. The results were used to calculate percent tin leached from these different PVC fractions. The synthetic lung and gastric biological fluids simulated potential inhalation and ingestion routes, respectively. Preliminary results showed that PVC particles >75 microns have the smallest wt % tin at 0.026% and particles >250 microns have the greatest wt % tin at 0.057%. Incubation results have shown that regardless of fluid type, most tin is leached within the first three hours. The final two-week sampling showed that PVC particles >25 microns in Artificial Lysosomal Fluid leached 2.30 times more tin compared with those in Gamble Solution. Further results of this project will give the scientific community insight into the likely environmental and human health consequences from the use of PVC, due to tin additives.

The Effect of the Myeloperoxidase Enzyme on Protein Tissue Oxidation and its Possible Implications in the Pathology of Rheumatoid Arthritis

Savannah L. Kile (Dr. Kathryn Matera) Department of Chemistry

Numerous research studies have established a correlation between rheumatoid arthritis (RA) and a high level of the oxidative enzyme myeloperoxidase (MPO) in synovial fluid of patients' inflamed joints. MPO has also been found locally among necrotic joint tissue and this tissue, composed mostly of collagen, has oxidative damage. It is likely that MPO is part of RA's pathology; however, its exact role is still unclear. The purpose of this study was to examine the potential interactions between MPO and collagen. To do this, binding studies were conducted between MPO and specific amino acids found in collagen (hydroxyproline, proline, and phenylalanine). Binding was measured by observing peak shifts in the UV-Vis spectrum of MPO both in the presence and absence of amino acids. For the binding study, proline (K_D=0.054mM) had a higher binding affinity to MPO compared to phenylalanine (K_D=0.072mM) and hydroxyproline (K_D=0.94mM). Preliminary enzyme kinetics studies using UV-Vis spectroscopy suggest that MPO does readily oxidize these compounds. Additionally,

SDS-PAGE qualitatively shows collagen being oxidized in the presence of MPO through visibly different banding patterns between unoxidized and oxidized collagen samples. Further studies will be conducted to determine the rate at which MPO oxidizes collagen and its subsequent amino acids. These results suggest that MPO contributes to the oxidation of collagen, which is a key mechanism within the pathology of RA.

Interactions Between Insulin and Amyloid-Beta Peptides: The Relationship Between Diabetes and Alzheimer's Disease

Mary C. Leupold (Dr. Kathryn Matera) Department of Chemistry

Research has shown diabetics have a significantly higher chance of developing Alzheimer's Disease (AD). Both diabetes and AD involve small peptides (insulin (Ins) and amyloid-beta (Aß) respectively) which interact to form soluble oligomers thought to have cytotoxic properties that contribute to neurodegeneration seen in AD. The exact molecular interaction between Ins and Aß remains largely undefined, however. In this study, the interactions between Ins and Aß peptides aggregated together were characterized using gel electrophoresis, Thioflavin T assays, and western blotting to define the molecular connection between the two diseases. The results of analyses show that when aggregated together, Ins and Aß form more oligomers than either peptide aggregated in isolation. Likewise, Thioflavin T assays identified larger soluble aggregate formation in Ins/Aß aggregates than in either isolated peptide. In summary, the results of this study suggest that Ins influences the aggregation of Aß, in a way that promotes the formation of deleterious oligomers associated with AD.

Examining FOLFIRINOX Resistance in Pancreatic Cancer Through Creating Resistant Cell Culture Models

Seth L. McKee (Dr. Victoria Del Gaizo Moore) Department of Chemistry

Pancreatic ductal adenocarcinoma (PDAC) is an extremely aggressive form of cancer with a 5-year survival rate of 8.5%. PDAC is often characterized by its early-stage metastasis, resistance to cytotoxic chemotherapy, and extremely poor prognosis. FOLFIRINOX is the current standard of care for patients who can tolerate its side effects, and is a cocktail of four anti-cancer drugs: 5-fluorouracil, leucovorin, oxaliplatin, and irinotecan. Despite FOLFIRINOX being the standard of care for patients with pancreatic cancer, the cellular response to the treatment is poorly understood. This investigation focuses on chemotherapy resistance to FOLFIRINOX in four PDAC cell lines. Using dosages based on ratios of each drug given clinically, GI50 assays with a cocktail of all four anti-cancer drugs in FOLFIRINOX were conducted in four independent PDAC cell lines. GI50 assays measure the concentration of drug needed to inhibit the growth of a population by 50%. The PANC 03.27 cell line was found to be the most sensitive to FOLFIRINOX with a GI50 value of 0.71 mM, while PANC 04.03 was found to have a GI50 value of 1.33 mM. These two cell lines were cultured in FOLFIRINOX in order to create a model of chemotherapy resistance. Both PDAC lines were treated with their GI10 dosage for three days and then allowed to grow until confluent. This treatment process was repeated multiple times with the goal of building and maintaining resistance to FOLFIRINOX. Currently, both cell lines have undergone three FOLFIRINOX treatments, and GI50 assays are being run to identify their change in resistance. After resistance is achieved, RNA sequencing will be performed on both treated (resistant) and untreated cells. Changes in gene expression accompanying resistance may lend insight into the underlying mechanism of resistance in FOLFIRINOX experienced by many patients with pancreatic cancer.

Investigation of the Structural and Antibiotic Properties of Vanadium Beta-lactam Complexes

Reiley K. Overend (Dr. Jen Dabrowski) Department of Chemistry

Antibiotic resistance is a growing concern in medicine; therefore, analogues of existing drugs need to be synthesized as alternatives to the lead compounds. The ultimate goal for all antibiotics is to maximize effectiveness, both in how well it fights an infection and how many types of bacteria it works on, while minimizing side effects. In recent years, researchers have started to make transition metal–antibiotic complexes using beta-lactams; in some studies, the metal analogues have been just as, if not more, efficient than the original compound. One transition metal yet to be studied is vanadium, a metal that has recently shown success in binding to drugs treating tuberculosis. Our research investigates the synthesis and characterization of vanadium complexes containing amoxicillin and amoxicillin trihydrate by NMR, IR, and UV-vis spectroscopy. Initial efforts examined the structure of two commercially available vanadium complexes– vanadyl(IV) acetylacetonate [$VO(acac_2)$] and tris(triphenylsiloxy) vanadium oxide [$VO(OSiPh_3)_3$]. Preliminary NMR analysis suggests the formation of complexes between $VO(OSiPh_3)_3$ and both amoxicillin and amoxicillin trihydrate is achievable. Future studies will explore additional precursors including vanadium (II) chloride [VCl_2] and sodium amoxicillin. Once sufficient quantities of the vanadium-amoxicillin complexes are prepared, an examination of their antibiotic activity against *E. coli* will be performed.

Investigation of Key Reaction Conditions in the Synthesis of Vanadium Antibiotic Complexes

Natalie S. Salerno (Dr. Jen Dabrowski) Department of Chemistry

Creation and utilization of antibiotics have become essential and foundational tools in modern medicine towards fighting bacterial infections and increasing life expectancy. Unfortunately, many antibiotics in clinical use presently pose a variety of issues that decrease their effectiveness and limit their range of treatment. To increase their therapeutic qualities, one approach has been to modify and enhance common antibiotic drugs. Past research has included the incorporation of metals into anticancer drugs, resulting in novel and effectual treatment. To increase efficacy in killing or inhibiting bacteria, using metal ions and known antibiotics to form metal–antibiotic complexes could potentially exhibit similar results. Vanadium, a transition metal with considerable abundance, is an ideal candidate for the development of metal-antibiotic complexes due to its biological relevance and ability to form stable compounds. Current research on the synthesis and characterization of vanadium–antibiotic complexes have demonstrated challenges to the solubility of these compounds in common solvents. Therefore, prior to combination, a range of solvents were screened to assess the solubilities of six vanadium complexes and six antibiotics – ampicillin, amoxicillin, tetracycline, penicillin, kanamycin, and erythromycin. All aforementioned solutions found to be fully soluble were characterized by SpyderCHECKER24 Color Calibration for RGB values of observed color. Moreover, each solution was additionally characterized via UV-vis spectroscopy to create a baseline for structural identification of potential vanadium the–antibiotic complexes. Ongoing research will investigate solubility, photochemical and structural properties of combined vanadium and antibiotics.

Investigation of Carbonic Acid Kinetics Under Physiological Conditions

Anna C. Sheinberg (Dr. Anthony M. Rizzuto) Department of Chemistry

Carbonic acid is one of the primary buffer components in the human blood system and is integral in maintaining a proper pH throughout the bloodstream. However, aqueous carbonic acid is particularly unstable in solution due to a rapid bidirectional decomposition equilibrium. Given this, many of its chemical properties in aqueous solution are unknown. This study aims to describe the kinetic properties of the aqueous carbonic acid system, specifically determining the rate constant for the dissociation of carbonic acid into water and carbon dioxide under physiological conditions. Using high resolution Raman scattering spectroscopy, we have shown that it is possible to spectroscopically differentiate between bicarbonate, carbonic acid, and the buffer components in solution. Because carbonic acid is so short-lived in aqueous solution, this study utilizes a high-speed liquid mixing system wherein carbonic acid is generated *in situ*, allowing us to accurately measure the decomposition rate of carbonic acid into water and carbon dioxide. Future studies will focus on quantitatively determining the kinetic mechanism and associated rate constant of carbonic acid within a system that mimics the pH of the human bloodstream.

Collateral Sensitivity of Acute Myeloid Leukemia

Connor R. Smith (Dr. Victoria Del Gaizo Moore) Department of Chemistry

Acute Myeloid Leukemia (AML) has a historically low 5-year survival rate compared to other types of cancers. This project is investigating the collateral sensitivity of AML by developing chemotherapy resistant cultured AML cells and then treating them with secondary chemotherapies to determine if the combination has a synergistic, or positive treatment effect. Cabazitaxel is a chemotherapy drug used clinically to treat AML, but cells frequently develop resistance to it. Experiments using MOLM-13 AML cells with Cabazitaxel were conducted to determine initial sensitivity. Currently, cells are being treated with increasing concentrations of Cabazitaxel to develop resistance. Once cell lines that are stable and non-reactive to the addition of the initial chemotherapy, a matrix of secondary chemotherapies will be applied to the resistant cell lines. Secondary treatments that successfully trigger apoptosis, or programmed cell death, in the majority of resistant cells would show promise in collateral sensitivity and fighting chemotherapy resistance. By determining the collateral sensitivity of AML lines it will allow future research to be done on the effectiveness of secondary treatments for patients that have AML recurrence that is found to be resistant to initial treatment.

Using Surfactants to Solubilize Luminescors to Aid in the Detection of Explosives Through Fluorescence Quenching

Tristan Torres (Dr. Karl Sienerth) Department of Chemistry

There are an estimated 22,800 backlogged cases dealing with fire debris and explosives awaiting forensic analysis across the United States. Investigators of crimes could benefit from a forensic analysis kit that could be deployed at the scene of the crime rather than waiting on lab analysis. Many explosive chemicals exhibit luminescence quenching, which is a decrease in fluorescence intensity. Kits that are based on one form, known as electrochemiluminescence (ECL), have the potential to be less expensive and therefore more affordable to municipal law enforcement agencies. In order to distinguish among various explosives and be effective, multiple luminescors would need to be utilized, but many known substances that exhibit ECL require non-aqueous solvents, most of which are hazardous. This barrier can be overcome with the use of surfactants to solubilize luminescors. For rapid screening of luminescor/surfactant combinations, 96-well plates were used in a fluorescence plate reader, with the intention of expanding to study ECL once optimum parameters have been

established. The luminescor used in experimentation was rubrene, and solutions of rubrene in toluene, a known solvent, were used to create a calibration curve to provide an estimate of maximum solubility of rubrene in the surfactant, TX-100. Varying concentrations of TX-100 above the critical micelle concentration (CMC) were used in determining the maximum solubility: 0.025%, 0.05%, 0.1% and 0.5%. Using those estimated values, rubrene/TX-100 solutions were studied using a fluorescence plate reader to provide a more accurate value for maximum solubility of rubrene; it was found that 0.5% TX100 provided the best results, with a rubrene solubility of 0.045mg/mL. To a set of rubrene/TX100 solutions of constant concentration, increasing amounts of TNT were added, followed by fluorescence analysis and calculation of the quenching factor (QF) for each solution. A plot of QF vs. TNT concentration yields the Stern Volmer constant (Ksv) as the slope. Theoretically, the Ksv should be unique to each luminescor/explosive pair. Similar studies have been conducted with luminol and TNT, and the results from those studies and other luminescor/explosive pairs will be reported.

NUT Carcinoma: Investigating Drug Synergy and the Building of Drug Resistance

Carolyn E. Vaughan (Dr. Victoria Del Gaizo Moore) Department of Chemistry

NUT Carcinoma (NC) is a rare cancer that results from the formation of an oncogenic fusion protein between a general bromodomain gene on chromosome 19 with NUT, which typically is only involved in genes for testes, on chromosome 15, causing high levels of undifferentiated cells to develop into malignant tumors. The average patient prognosis is between 6-7 months with a 0% survival rate. In clinical applications, NC has a high chance of becoming resistant to treatments, meaning cell protein function is no longer blocked and cell death does not occur. Current clinical studies focus on the effects of single drugs on NC, yet there is more to be investigated for synergistic drug treatments. The purpose of this study is to investigate different drug combinations that could be of use clinically, as well as to create cell resistance in NC cell lines which will then be used to determine the sensitivity of both resistant and non-resistant cells to various chemotherapy drugs. Currently, 3 separate cell lines directly derived from NC patients (kindly gifted from Dr. French, Brigham and Women's Hospital, Boston) are being evaluated for their sensitivity to different chemotherapeutic drugs. Once the initial sensitivity is determined for each line, growing resistant cultures and combination treatments can begin.

Determination of Elemental Composition in Various E-Liquids

Connor T. Willis (Dr. Justin Clar) Department of Chemistry

Vaping and the use of e-liquids has grown in popularity over recent years. E-cigarette liquids contain a complex mixture of components, including nicotine and heavy metals. There are serious questions about the safety of vapes based on the poor regulatory structure of e-liquids, on both the state and federal level. Most research has been conducted on mislabeled nicotine concentrations, focusing on the nicotine levels and whether they match values the manufacturer advertises. Little research has been done in identifying trace metals within the liquids and the potential hazards these metals may have on the health of the consumers. The goal of this project is to screen a variety of e-liquids from different manufacturers for trace metal content. So far, 12 flavors of e-liquids from five manufacturers have been screened. Samples are prepared using microwave acid digestion via EPA method 3015 and diluted to contain a 5% nitric acid concentration. These samples are analyzed via inductively coupled plasma - optical emission spectroscopy, (ICP-OES), in order to determine what metals are present. Preliminary data suggests the presence of aluminum, calcium, copper, magnesium, and potassium,

ranging from 0.1 to 2.0 ppm depending on the metal identity. Some data have also shown traces of arsenic and selenium in samples that may be confirmed following further sample data collection. Next steps include expanding samples available from various manufacturers and brands, then comparing trace metal concentrations based on brand to determine if there is a significant difference between them. Future directions for this project include aiming for lower detection limits through the use of inductively coupled plasma – mass spectroscopy, (ICP-MS), and screening samples from shops that allow customers to "make their own" e-liquids.

Cinema & Television Arts

Bi-erasure is Not Funny: Bisexual Erasure and Representation in ABC's Scripted Comedies (Fall 2019) *

McKenzie E. Miller (Prof. Staci Saltz) Department of Cinema & Television Arts

Biphobia is a present factor in both heterosexual and homosexual communities. Media research from GLAAD and other publications show that with more representation on accessible television series, the less biphobia will persist. This thesis critically analyzes bisexual representation and erasure in scripted television comedies on the network ABC by using a critical analysis approach, ten comedies on ABC are analyzed for the amount and depth of bisexual representation in each show. I chose the network ABC because they aired comedies in fall of 2019 and shows on the network are uploaded on the American streaming service, Hulu. The accessibility of the network is a factor due to the network being able to reach more viewers. Only episodes aired in fall of 2019 of each show are chosen, since that was the most recently completed time period at the time that the research process began. Using inspiration from previously made representation tests, including the Bechdel test and the Vito Russo test, the data is collected through a series of qualifications pertinent to bisexuality and stereotypes of bisexuality. This analysis is focused on the amount of representation and if the representation is used to advance character development and add depth to the character. This research adds to previous studies on representation of bisexuals by looking at recent network comedies for bisexuality, a section of representation not often studied in the past.

Communication Design

The Army-McCarthy Hearing: Analyzing Attitudes in Front-Page Articles from the New York Times and Washington Post, April-June, 1954

Catherine E. Dalrymple (Dr. Harlen Makemson) Department of Communication Design

This study explores the ways in which the New York Times and Washington Post depicted the controversial Army-McCarthy hearings of 1954 on their front pages. The three-month hearing investigated an accusation by the U.S. Army that Roy Cohn, the lawyer of Senator Joseph McCarthy's committee, had forced the military to give a former aide preferential treatment while serving. This trial is largely considered McCarthy's last major senatorial act; public opinion increasingly disfavored the senator, and he was censured just months later. Starting in 1950, the Wisconsin senator had become notorious for his aggressive anti-communist agenda. From his Senate chair, McCarthy led a four-year "reign of terror" while permeating an intense fear of sedition throughout the country (McNamara 2005, 85). The result was McCarthyism, the tendency and general strategy of levying accusations of

treason— usually related to communism— without sound evidence. While extensive scholarship has discussed McCarthy's relationship with the media— particularly his manipulation of, and condemnation by, the press— this research was intended to analyze how major publications portrayed the senator in real-time. The goal was to gain insight on potential changes in media depiction and public opinion of McCarthy throughout the three-month trial. After randomly selecting editions from the timeframe of the hearing, headlines, ledes (topic sentences), and nut graphs (first full paragraphs) were coded for their language related to McCarthy and inquiry proceedings. Words and phrases were categorized by three themes: objective, pro-victim, and anti-McCarthy sentiments. The conclusion of this research is nuanced, but the coverage in these publications generally align with 1954 public opinion: an increasing distrust of McCarthy and his senatorial actions. Although the Times and Post varied in their coverage and language used, the examined articles can serve as an indicator of the growing disdain for McCarthy and his methods, mirroring public opinion and demonstrating its relationship with national media coverage.

Developing a Workshop to Address High School Mental Health Through Human-Centered Design

Henry Gartner & Mikayla Ford (Dr. William Moner & Dr. Danielle Lake) Department of Communication Design and Center for Design Thinking

Mental health issues in adolescents have been a concern for decades and have been amplified by the stress of COVID-19. Research indicates that the pandemic has increased the prevalence of stress-related disorders, depression, and anxiety among this age group. The Design for America (DfA) studio at Elon University uses research-informed design practices to address social issues present in our community. This poster reports on our project in partnership with Elon Academy, a college access and success program for local high school students run by Elon University through the Center for Access and Success. We demonstrate the research and design processes used to reimagine a summer program to support the mental health and well-being of high school students as they transition to college. The current study shares details of the program prototype, a plan for implementation in Summer 2021, and intended methods of assessment for ongoing research.Results of the design process will also be shared with a larger audience through the Design for America national organization. The issue of mental health among the youth is hurting student potential and hindering performance. We want to educate rather than stress, and hopefully, continue to influence high school students' lives for the better. The findings from this research go beyond DfA and Elon Academy. Other high school programs that have similar structures and similar goals as Elon Academy, can use the findings from this research coupled with the DfA design process, to implement solutions that better support the mental health and well-being of students.

Conflict Made Visible: A Content Analysis of the Murals of Northern Ireland

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Conflict, both physical and otherwise, is a driving force behind the creation of public art and design, from murals and sculptures to memorials and graffiti. Divisions within conflict drive people to publicly express where they stand. This quantitative content analysis examines one example of public art/design within conflict: the murals of Northern Ireland from the period of unrest known as the Troubles. Specifically, this study analyzed 210 murals created by the groups involved in the Troubles including the Nationalists, Loyalists, and neutral or non-aligned parties. An analysis was done investigating

patterns between murals representing these groups. Three coders analyzed these murals for (1) two-dimensional design elements, (2) traditional Irish imagery, (3) religious imagery, and (4) violent imagery. While analysis is still ongoing, initial results indicate that there are, indeed, differences. For example, Loyalists are significantly more likely to use flags in their murals than Nationalists. When Nationalists do use flags, it is almost always an Irish flag (87.5% of Nationalist murals contained an Irish flag), and when Loyalists use flags it is almost always either British or Northern Irish (68% of Loyalist murals contained either a British or Northern Irish flag). Further analysis is ongoing.

Computer Science

Social Network Analysis of Christian Identity Hate Groups Since the 1920's

Katherine J. Grant (Dr. Megan Squire) Department of Computer Sciences

Christian Identity (CI) is an anti-Semitic and racist ideology common to some white supremacist groups. CI has inspired numerous acts of domestic terrorism and white supremacist groups over almost 100 years in the United States. The ideology originated in the 1920s with practitioners meeting in small local groups to develop and propagate this theology. The ideology is still promoted today, with adherents active on online messaging applications. As an ideology that encompasses a multitude of organizations, leaders, and individuals connected to each other over many years, CI can be studied as an example of a clandestine, social network due to its covert and illegal characteristics. Social Network Analysis, a data science technique used to analyze data from social networks, will be used to assess the relationships and memberships among groups and individuals who identify as CI. Since CI's origins are in the 1920's, data from arrest reports, news coverage, books, and primary source documents will be used to create a historical network. The dataset can be modeled as a two-mode undirected network of individuals and organizations, with connections reflecting various types of relationships between appropriate actors. Social Network Analysis statistical measures and techniques can then be used to analyze the connections between CI groups and people over time in order to understand and expose the structure of this violent, hateful ideology for the first time.

Human Motion and Body Position Detection with LIDAR-Based Depth Sensors

Grant Nickell (Dr. Ryan Mattfeld, Dr. Srikant Vallabhajosula, & Dr. Matthew Wittstein) Department of Computer Sciences and Department of Physical Therapy Education

Advances in technology involving computer vision are at the forefront of human-computer interaction, particularly in enabling computers to estimate human motion and body position. A camera provides two dimensional images which cannot be used to determine how far away an object stands. When the XBox Kinect was released in 2010 it revolutionized human motion detection by including depth sensing technology. The XBox Kinect was discontinued in 2017—and while Microsoft has continued development of a similar device called the Azure Kinect, this new device is not fully accessible due to its proprietary nature. Our research aims to create an open-source depth sensor that can track human motion using LIght Detection And Ranging, referred to as LIDAR. While the Kinect uses infrared to measure depth, LIDAR is an alternative technology that has historically been more expensive. LIDAR measures depth by emitting a laser and measuring the time it takes to reflect back to the sensor. Two prevalent forms of LIDAR are flash and collimated. Flash LIDAR emits a wide diverging laser beam in a single pulse; whereas, collimated LIDAR stacks lasers vertically and spins them rapidly. Since driverless cars have begun to use LIDAR technology, its cost is decreasing. To apply LIDAR to human

motion estimation, we must evaluate its accuracy for finer movements—a mostly unexplored niche due to driverless cars needing only to estimate the general position of nearby objects. In order to accomplish this goal, we are evaluating against a passive marker motion capture system, the technology used as the gold standard in this field. We performed a preliminary experiment recording the movement of a human subject with the Azure Kinect, the Ouster OS0-128 (collimated LIDAR), the Intel RealSense L515 (flash LIDAR), and the passive marker motion capture system in the Elon Biomechanics Lab using QTM Software (Qualisys AB, SWEDEN). A human subject completed 14 tests of human motion and body position including still poses, walking, and squatting in different directions. Once we have analyzed the joint position data, we hypothesize that LIDAR will perform at least as well as the Kinect in terms of accuracy.

Peering Under the Mask: Reconstructing Masked Faces Using Adversarial Networks

Timothy P. Redgrave (Dr. Scott Spurlock) Department of Computer Sciences

During the COVID-19 pandemic, many individuals feel isolated and struggle to connect with others when wearing face masks. The purpose of this research is to construct what the face of a person may look like underneath a face mask using a generative adversarial network (GAN). This task is particularly difficult due to the lack of appropriate datasets for model training containing paired images of masked and unmasked faces. This project explores and compares two alternative methods to address this challenge. The first method focuses on how effective a traditional GAN is when trained with a synthetic dataset, constructed by augmenting a set of real face images with a paired, synthetically masked image for each actual face image. The second method explores the cycle GAN framework, which utilizes two paired GANs to construct inverse mappings in order to perform unpaired training. Results of this project will further the discipline's understanding of the efficacy of synthetic datasets in comparison to unpaired training with a cycle GAN. We anticipate that a cycle GAN will produce more realistic looking face images than the use of a synthetic dataset. This is a step towards a full application that could help people feel more connected through being able to see other's faces while remaining masked.

Economics

An Analysis on the Relationship between High School Sports and Educational Outcomes

Kyle Fränkel (Dr. Katy Rouse) Department of Economics

The current global pandemic has had countless wide-ranging impacts, including a reduction in many high school and college sports programs. In addition, numerous youth sports programs have moved to a "pay-to-play" model, with high fees, leaving them too expensive for many families. These threats to youth athletic program access are concerning given the various non-cognitive benefits that participation in sports may have on children and adolescents. While evidence suggests the importance of non-cognitive skills is growing, there is little recent research examining the returns to high school athletic participation on educational outcomes. Participating in athletics takes time, which may be a detriment if it reduces time for academic studies. On the other hand, athletics may be beneficial if a student gains valuable skills such as time management, which increases academic efficiency of the fewer hours left to study. Therefore, theoretical predictions are ambiguous making this an interesting empirical question to address. Using data from the 2002 Education Longitudinal Study, this paper compares non-athletes to athletes and athlete-captains on their educational outcomes measured by high

school GPA, years of education, and whether the person earned a Bachelor's degree. As a baseline, first an ordinary least squares (OLS) regression is run without any controls. Subsequently, I run an OLS regression, controlling for a wide range of school and family controls (income, race & ethnicity, etc.). Finally, I estimate a school fixed effects model, controlling for permanent characteristics of a school. Preliminary results indicate that while athletes perform better than non-athletes, athletes also outperform their athlete-captain counterparts.

The Economic Impact of Allowing Refugees the Right to Work

Graham O. Hutchinson (Dr. Brandon Sheridan) Department of Economics

It is estimated by the UNHCR that there are around 80 million refugees in the world today. This research is aimed at determining what economic effect, if any, refugees have in their new host country. Refugee status does not take away from the fact that everyone is human, and this leads into the idea that these refugees must bring some amount of human capital with them to their host country. Under this assumption, it may be feasible to think that refugees have the capability to positively affect their host nation's GDP. Previous research has primarily produced two schools of thought regarding this proposition. Some research argues that an influx of refugees to a country puts pressure on jobs, wages, and resources in that country and therefore hinder the economy to a slight extent. Other research argues that refugees do indeed have the capability to contribute to the economy in a positive manner. This argument rests on the idea that refugees are given the right to work and own businesses in their host country. In the absence of such policies, refugees would not be able to earn a wage or own a business which reduces the potential effect they could have on the economy. I looked at the 17 countries hosting the largest population of refugees in the world from the years 2006 to 2019. The dependent variables in my regression equation include capital formation (constant 2010 $), human capital (% of government spending on education), total population, and the number of refugees in each country. I tested the impact these variables had on GDP per capita which was measured in constant 2010 US dollars. To account for the fact that I am using panel data, I tested a fixed effects model with robust standard errors with a dummy variable for whether refugees are allowed to work in that specific country or not. My results determined that there was no statistically significant relationship between the number of refugees in a country and GDP per capita. Further econometric specifications may reveal a more significant relationship, as there is still more to be done with my research.

Federal Reserve Announcement Shocks on United States Equities Markets, as Reflected in Volatility

Avery H. Keller (Dr. Brandon Sheridan) Department of Economics

Prior to FOMC meetings, investors predict and assess the upcoming Federal Reserve announcements. Federal Reserve communication is key to gauge the health of the economy, especially during times of heightened uncertainty, such as the financial crisis, and most recently, the COVID-19 pandemic. This paper explores the relationship between the Federal Reserve's monetary policy announcement shocks and U.S. stock market volatility. Specifically, this study looks at daily U.S. stock market volatility from days around regularly scheduled FOMC meetings and days of actual policy decisions involving the target level of the federal funds rate. To execute this study, I utilize monetary policy data from FOMC meetings, Federal Fund Futures data, and CBOE VIX data from January 2009 to December 2020. I utilize the unemployment rate, Wilshire 5000 index, S&P 500, 10-Year Treasury Rate, CPI, and Real Personal Consumption Expenditures, as control variables in this study. To define Fed

monetary announcement shocks, or surprises, I use the change of the expected versus actual federal funds rate. I take the absolute value of the deviation regardless of which side the economic shock falls, for instance, if the actual federal funds rate is greater than or less than the expected federal funds rate. The results suggest that there is a positive correlation between monetary policy and daily stock market volatility. The CBOE Volatility index indicates that market uncertainty rises on days preceding regular scheduled federal funds rate announcements. After the actual federal funds rate is released, the financial markets react and volatility increases as well. On the 8 FOMC meeting days per year, heightened volatility occurs due to uncertainty and risk. This study has implications in reflecting market movements. Using the federal funds rate as a policy tool allows investors and policy makers to gain market insight, and to predict the course of future monetary policy.

Investigating the African Gender Education Gap

Kelley M. McCarten (Dr. Tina Das) Department of Economics

Research has shown educational attainment to be one of the more disproportionate issues within gender inequality with very little consistency across the world. According to a 2010 World Bank study, 14% of countries have a third of women receiving little to no education after the age of fifteen and Africa showed 40% of women over fifteen having no education in sixteen of thirty nations. In addition to female education attainment issues, violence has presented itself as a widespread problem throughout Africa with the second highest region of 2012 homicide rates, and double the world average (Heineman and Verner 2). Relevant academic research has been done within subtopics of education and violence within African, however, this study proposes to investigate whether poor educational attainment of women is a direct consequence of violence in African countries. In a region where educational opportunity is disproportionate between men and women and violence decreases quality of life, it can be hypothesized that increasing violence is negatively affecting females and specifically educational attainment for females. To investigate this topic, data will be taken from the World Development Indicators and an Internal Violence Index to empirically investigate both violence and education rates in fifty-two African countries. WDI variables include female educational attainment of African females, government expenditure on education as a % total of GDP, labor force participation rate of African females, and lastly GDP per capita. The violence measurement is an Internal Violence Index which is a composite and quantitative measure of internal violence and crime for each of the 52 chosen African countries. Initial results show women at a disadvantage in the academic setting, but further analysis is being conducted to conclude if this is a direct consequence of the high rates of violence prevalent in the country.

The Economic Impact of Critical Habitat Designations on Indigenous Communities in Northern Alaska

Caroline G. McGimsey (Dr. Andrew Greenland) Department of Economics

In 2010, the U.S. Fish and Wildlife Services, as part of the Endangered Species Act of 1973, determined a portion of northern Alaska as essential to Polar Bear conservation. This area is known as a critical habitat designation (CHD), and with it comes restrictions to the activities that can be carried out within the CHD. In Northern Alaska, the primary projects affected are oil and gas, construction, and shipping activities that require federal funding (Final Economic Analysis, 2010). These impacts will likely decrease the number of jobs available and therefore lower the income to Native Alaskan individuals. Currently, no studies have analyzed the economic impact of critical habitat designations

on American Indian and Native Alaskan populations in the United States. Using data from the U.S. Integrated Public Use Microdata Series (IPUMS) a Difference in Differences model was used to compare changes in incomes of individuals living inside and outside of the critical habitat designation both before and after its implementation 2010. This paper helps to inform us on how seemingly good policies might have disproportionate unintended consequences to historically marginalized communities.

The Impact of Childhood Parasitic Infection on Future Wages in Indonesia

John M. McGinley (Dr. Tonmoy Islam) Department of Economics

One of the particularly cruel aspects of poverty is its persistence across multiple generations in a family. A current generation in poverty may have less access to health care and educational opportunities, or live in an area with environmental harms, factors which can begin building up even in-utero, and which can limit a child's potential to escape from familial poverty. This research will explore how poor health during childhood could affect an individual's future wages as an adult. While past research has utilized health measures such as low birth weight, I will specifically look at infestation by parasitic worms. It is hypothesized that a parasitic infection in childhood could limit human capital accumulation, which will lead to lower wages as an adult. Using data from the Indonesia Family Life Survey, a panel dataset extending from 1993 to 2014, I estimate a model using wages in 2014 as the dependent variable and worm infestation in 1993 as the independent variable of interest, while controlling for several demographic and socioeconomic factors. The preliminary results show an inconclusive direct effect with regards to the impact of parasitic infection on future wages. However, there was a significant negative effect on educational attainment, one of the primary mechanisms by which it was hypothesized that infection could lower human capital.

The Impact of Technology Use on Cognitive and Non-cognitive Skills of Elementary School Students

Marybeth C. Nemecek (Dr. Katy Rouse) Department of Economics

Since the beginning of the 21st century, technology use in homes and schools has increased exponentially. Further, recent current events of the COVID-19 crisis have led to longer and more frequent exposure to technology by children for both education and recreation. This increased reliance on technology could have lasting implications on the development of children's cognitive and non-cognitive skills and on achievement disparities in the United States. On one hand, exposure to the internet and other forms of technology may increase children's eagerness to learn and act as an investment in human capital. On the other hand, technology use may increase the potential for distraction, leading to non-productive time use. Despite the rapid growth in technological innovation, the literature on technology use and cognitive skills remains inconclusive, and little is known about non-cognitive impacts. Non-cognitive skills, or soft skills, include attributes such as perseverance, attentional focus, self-esteem and social skills. Understanding the role of technology on children's skill formation is crucial given the well-documented importance of childhood skills on later life outcomes. Moreover, research suggests technology has created what is known as a digital divide, furthering inequality for those who do not have access to such resources. Using data from the Early Childhood Longitudinal Study Kindergarten class of 2010-2011 (ECLS-K:2011), this study incorporates fixed effects methods to recover plausible causal estimates of technology on cognitive and non-cognitive outcomes. Further, Internet Access Services Reports data from the Federal Communications

Commission (FCC) is used as an instrument for home computer use to control for reverse causality. I also estimate the results by racial and income subgroups to determine whether or not there is evidence of a digital divide. The findings suggest that technology use in both school and at home has the potential to increase test scores. Home use is also found to positively affect non-cognitive skills, but results suggest more frequent use at school negatively impacts non-cognitive outcomes. These effects are exacerbated for lower income individuals, indicating that a lack of access to technology or broadband service is more likely to disadvantage cognitive and non-cognitive development of low-income elementary school children.

The Gender Effect of a Nation's Leader on Environmental Performance

Morgan C. Rafferty (Dr. Casey DiRienzo) Department of Economics

Previous research shows that women can be far more effective leaders than men due to their stronger emphasis on social and environmental well being. Many researchers have explored the impact of women in corporate leadership positions, but little is known about the impact of elected officials. As more women begin to enter the political field, generating a clearer picture of gendered leadership success will help voters make educated decisions. Specifically this study examines the relationship between the gender of a nation's leader and environmental performance of the country. As our planet begins to face irreversible damage from climate change, environmental action is critical and should be an important factor while screening candidates. Using data from the Council on Foreign Relations: Women's Power Index, Environmental Performance Index, and the Organisation for Economic Co-Operation and Development database allows for a comprehensive look at the impact of previous female leaders' on the environment compared to their male counterparts. The primary hypothesis: female leaders will contribute to better environmental performance and increased investment within their nation.

Is Having a Child Damaging to a Woman's Earning Potential: A Regression-Based Analysis of the Motherhood Penalty*

Alexa Rae Rasmussen (Dr. Steve DeLoach) Department of Economics

The motherhood penalty was a term coined by sociologists to explain the phenomena of women entering the workforce as mothers and experiencing systematic disadvantages in pay, perceived incompetence, and receiving fewer benefits relative to childless women, on average. A wage penalty for mothers holds the potential to produce numerous adverse consequences for women, such as exacerbating gender inequality and allowing discrimination to continue infiltrating the labor force. In analyzing the motherhood penalty through a regression-based analysis, this research ultimately aims to answer the question: do young women who want to maximize their utility in the labor market through making the highest possible income have to choose between their career and bearing children? To answer this question, I extracted data from the National Longitudinal Survey of Youth and used 1979-2000 as the timeframe analyzed. A nationally representative dataset, the NLSY79 provides panel data originating in 1997 and follows 12,686 young men and women between the ages of 14-22 in the United States over an extended period. Restricting my sample to only include women employed full-time, I will run both Fixed-Effects Models and 2-Stage Least Squares models to analyze the motherhood penalty. My goal is to see how large the penalty for mothers is per child, how long this penalty lasts, and how this penalty varies by educational attainment and industries. Thus far, my analysis has found that women face a wage penalty of -12.5% for the first child, relative to childless

women, all else equal. When looking at highly educated women, defined as at least two years of college, the wage penalty increases to -16.9%. My research concludes that women who have children face a wage penalty, and the penalty is higher for educated women.

A Seat at the Table or a Power Seat: The Impact of Simple Representation Versus Power Representation of Women in Government on Funding for Primary Education

Pearl E. Sullivan (Dr. Casey DiRienzo) Department of Economics and International & Global Studies Program

A large body of research shows that female politicians focus more on common good issues, such as health care and education, than their male counterparts Even if women are present in the government, these issues may not be raised when men hold the majority of positions of political power. In this research, I use a cross-country panel dataset to examine the impact of women in government on public spending on primary education, an important public good. Specifically, I explore whether it is enough for women to be represented in government, or if they must have a position of power to affect policy outcomes. The research fills multiple gaps in the literature as previous research is inconclusive on the impact of women's representation on funding for education and practically nonexistent regarding the impact of women's power representation on education spending. The analysis' results indicate that both women's simple representation and power representation are significantly positively correlated with increases in federal spending on primary education; however, when women hold positions of political power there is a greater impact on funding than when they simply hold a seat in the legislature.

Predicting Power: Investigating the Relationship between Economic Growth and Geopolitical Influence

Maxwell J. Zucker (Dr. Mark Kurt) Department of Economics

Prior research has suggested a strong relationship between economic growth and specific displays of power including military spending, international trade and foreign investment. However, very little looked at the comparison between economic size and growth with international influence. Using data from the World Database Indicators from 270 countries, regions and sub-regions between 1960-2019, this paper amalgamates different measures of power into one understanding of "geopolitical influence." I show the causal effect of economic growth on two indices of power; one that includes total spending "powerdollars" and another as a percentage of GDP "powerpct". Exploiting the panel nature of the data, I include country fixed effects to estimate plausible correlation over time. The results suggest a negative correlation between economic size and "powerpct," and a positive statistically significant relationship between GDP and the "powerdollars." This indicates that increases in total economic growth and economic size can lead to higher levels of geopolitical influence, manifested in a variety of different ways. The implications of this study motivate further examination into the relationship between the rate of economic growth and geopolitical influence as well as distinguishing appropriate measures for power.

Education and Wellness

How Teachers Help Struggling Readers Choose Books

Megan Rose Aurentz (Prof. Marna K. Winter) Department of Education & Wellness

Research shows that students are more motivated to read when they are interested in the text (Guthrie & Klauda, 2014). Often, texts that students are interested in are not at their independent reading level (Broaddus & Ivey, 2002). When matching a book for leveled reading instruction, many teachers place an emphasis on the reading level of the book with little regard to students' backgrounds and interests (Dzaldov & Peterson, 2014). Interesting reading material engages learners in the content often motivating them to continue to engage in the reading process, thus feeling more successful as readers (Fulmer & Frijters, 2011). This study aimed to explore the strategies used by teachers to help select books for struggling readers. Specifically, this research sought to answer, how do teachers help struggling readers choose books? This small scale qualitative survey was sent out on social media outlets including, Twitter and Facebook. Fifteen participants responded, seven of which have earned a master's degree and eight having a bachelor's degree. Participants have a wide range of teaching experiences ranging from less than five years to more than ten years. Some findings were aligned with what is known about classroom practices and included teachers' use of standardized testing and student interest surveys to learn about students as readers. Most interesting from the findings include that teachers share that struggling readers want to read graphic novels, but only three out of the 15 participants choose graphic novels for them to read. Instead, teachers acknowledge giving them other genres including nonfiction and fiction. According to the data from this small scale survey, teachers report using interest to choose books for their readings, but share that their practices do not always align with this belief. Further research should be conducted on a larger scale to draw more significant conclusions.

Understanding Influences on Cultural Competence in Teacher Candidates*

Ashley R. Billie (Dr. Joan Barnatt) Department of Education & Wellness

This mixed-methods study utilizes descriptive statistical survey and interview data from teacher candidates, focusing on influences of cultural competence. Cultural competence is operationalized by performance on the Cultural Intelligence Survey (CQS) which identifies areas of relative strength (Metacognition and Motivation) as well as weakness (Cognition and Behavior) and in four dimensions. Semi-structured, face-to-face interviews were conducted on a sample of teacher candidates with varying cultural competency scores to further explore the reported influences. Teacher candidates identified three areas of major significance that influenced their understanding of cultural competence as teacher candidates. These included the influence of the community they were raised in; perceived strengths and gaps of their teacher preparation program; and the opportunities, or lack thereof, for representation of their own identities in curriculum and pedagogy. As pre-service teachers, it is imperative that one remain cognizant and competent of the various identities that students hold within a classroom. By understanding the influences that teacher candidates have had within their lived experiences, one is able to fully assess best ways to combat their own biases and better direct their teaching towards a diverse classroom. Additionally, teacher preparation programs need to be cognizant of growth opportunities for cultural competence in their programs. In particular, those that may influence cognition and behavior of teacher candidates, while honoring the various identities of all students.

Examining Elementary Educators' Awareness and Perceptions of Trauma-Informed Teaching Approaches

Lucy T. Callicott (Dr. Katie Baker) Department of Education & Wellness

A current topic in education is that of embedding trauma awareness and sensitivity into teaching practices. The greater movement around trauma awareness is often referred to as trauma-informed care (Felitti et al., 1998). Past research has shown that trauma and toxic stress affect almost every aspect of a child's school experience (Carello & Butler, 2015; Perfect et al., 2016). Underlying trauma can inhibit students' cognitive functions and lower academic performance. Prior research reports that trauma-informed care can mitigate traumatic impacts (Udesky 2018, McInerney & McKlindon, 2014); however, the research base lacks teachers' insights about trauma-informed (TI) teaching approaches. Teachers' voices are needed in the research in order to ensure sustainable, effective, and equitable implementation of these transformative approaches. This ongoing qualitative study is documenting and examining elementary educators' awareness levels and perceptions of TI approaches through a two-phase data collection process: Phase 1 (completed) collected data from an online anonymous survey that consisted of closed and open-ended response items aimed at capturing educators' contextual information and their perceptions about TI approaches. Phase 2 (in progress) consists of in-depth, semi-structured interviews with selected participants to provide further insight into educators' perceptions. This presentation will overview pertinent findings from Phase 1, including, that of the 54 survey respondents, 37 percent had not even heard of TI approaches. Survey respondents represented diverse geographical backgrounds and a variety of PreK-5 teaching and elementary support positions. Initial analysis of qualitative survey data revealed common themes: (a) even if educators understand the need for TI approaches, implementation is difficult, (b) educators want more professional development opportunities around the topic, and (c) COVID-19 and the current political climate have added new layers of trauma in schools. These themes bring up meaningful questions about how educators can best be supported in implementing approaches that center their students' best interests. The study has revealed that there is a lack of a broad, universal understanding of these approaches among educators. Implications of these initial findings have the potential to shape education policy, professional development, and future practices of teacher education programs regarding TI approaches in schools.

Teacher Disclosure Dilemmas in the 21st Century

Jake C. Cisternelli (Dr. Jeffrey Carpenter) Department of Education & Wellness

Teachers face dilemmas regarding how much of their own perspectives on contentious topics to disclose to their students. For example, many teachers and the communities they serve feel that teachers should limit how much of their political beliefs they disclose (make known) in class. Teachers' political beliefs may contradict those of their students or their families, and students and families may feel uncomfortable if their teachers voice their political beliefs in particular ways or contexts. Such dilemmas regarding what and when teachers should disclose about their perspectives have existed for a long time. However, in recent years social media appears to have added new angles to disclosure dilemmas. Social media can make teachers' opinions on controversial matters more publicly visible. We therefore sought to investigate the following research question: how are the disclosure dilemmas that teachers face similar and different in the context of 21st Century Classrooms? This question is important because technology and the current contentious political environment makes disclosure dilemmas more complicated. Also, in some cases teachers have been censured and even dismissed from their jobs because of their social media activities (Warnick, Bitters, Falk, & Kim, 2016). We sought to address our research question by conducting a critical literature review related to teacher disclosure dilemmas. We consulted a variety of theoretical and empirical sources that addressed disclosure dilemmas in and out of the classroom, and included case studies of teacher disclosure and its effects. Key themes were ruminated upon in order to come to conclusions regarding

teacher disclosure dilemmas in the 21st century. We identified tensions that social media has created and will create around teacher disclosure. For example, social media can lead to comments from teachers in-class and out-of-class being taken out of context and misinterpreted.

Gender(ed) Matters in Nature-Based Education

Abigail M. Decker (Dr. Scott Morrison) Department of Education & Wellness

This presentation will overview a two-phase qualitative study of the ways in which gender is communicated, experienced, and constructed in nature-based education. Drawing from Frödén's (2019) *situated decoding of gender* and ecofeminist theory, we sought to explore the potential of nature-based education to serve as a tool for decoding gender and disrupting harmful notions of gender in students. The first phase consisted of semi-structured interviews with 20 environmental educators to understand their perceptions of the role gender plays in their work with children outside, while the second phase consisted of over 30 hours of fieldwork conducted in three nature-based learning spaces: one private outdoor preschool in the Northeast United States and two public elementary school garden clubs in the Southeast United States. In our analysis of the fieldwork data, we found that there were four main themes contributing to the construction or deconstruction of gender within nature-based education: the materials, or the tools, toys, and clothing; spaces, or the physical environments students learn within and move between; conversations**,** or the language used by and between students and educators outside; and educators, or the actions of teachers and other adults that respond to and influence student gender constructs. While much of our data suggested gender being communicated and experienced differently outside—and perhaps gender norms even lessened—it was also concluded that educators must be intentional about curating and maintaining a gender decoded learning environment. This is especially important as our interview responses reflected limited confidence from environmental educators to draw any conclusions about the role of gender in learning outside. To intentionally decode gender, educators must realize that gender is being constructed at school by and for children and realize the ways in which it is communicated and experienced. They must also recognize when gender constructions are harmful and when they must be disrupted, and must know how to respond both immediately and long-term to cultivate a gender-decoded learning environment.

Building a Mathematical Community when Pivoting to Virtual Learning: A Case Study of a Kindergarten Virtual Classroom

Allie P. Forsterer (Prof. Erin Hone) Department of Education & Wellness

The National Council of Teachers of Mathematics puts forth eight teaching practices that provide a framework for high quality math instruction situated within a positive mathematical community (NCTM, 2015). Jo Boaler, the creator of Youcubed and professor at Stanford University, promotes the importance of mathematical mindsets in the classroom. Boaler emphasizes the building of a mathematical mindset community for students to feel safe and supported to do math at high levels. Math mindset communities support students to believe they are capable of learning high levels of math and value their own mistakes (Boaler, 2016). Such a community is built through teachers' positive messages that encourage and motivate students, but more importantly through their actions that fill the environment with wonder and curiosity. In such an environment, the teacher consistently recognizes and praises different strategies and ideas. The teacher uses content that promotes student engagement and student reasoning, such as visuals that build conceptual understanding and open tasks that invite students to see strategies in different ways. In turn, this will lead to deep, transferable math understandings. Due to the Covid -19 pandemic, most public schools began the year with complete

virtual learning. Research and anecdotal evidence about how those practices translate to a virtual learning setting at the elementary level is nearly non-existent. This study provides a case study of one local elementary teacher who purposefully worked to create this positive mathematical community within her virtual kindergarten classroom. Virtual observations and a teacher interview encompassed the specific practices this teacher used to build a strong online math community. Observation notes were coded according to the elements of a mathematical mindset community (YouCubed, 2018). The findings from this study indicate ways in which strong math practices translate into a virtual learning setting and the positive impact of those practices on young students. Our findings verify that intentional math teaching practices within a strong math community transcend the learning space.

Secondary English Language Arts Teacher Response to Online Learning in 2020 Pandemic*

Eleanor M. Gaudin (Dr. Joan Barnatt) Department of Education & Wellness

When the Coronavirus Pandemic struck the United States in March 2020, many schools were forced to close their doors and transfer learning to online classes. Although there can be no certainty in how the shift to online teaching will impact education in the future, it is certain that the time teachers spent in remote instruction will have a lasting impact on education in the future. This interpretive study used interviews and survey responses for qualitative research purposes. To better understand the experiences of teachers during this time of online instruction, we asked the questions: What is the experience of secondary English Language Arts teachers to online learning during the 2020 Covid-19 Pandemic? What are the supports and challenges experienced for effective teaching in an online format? Secondary English Language Arts (ELA) instructors from a local school district were recruited to complete a 30-minute online survey using seven-point Likert scale questions and open-ended, short answer responses. Additionally, to develop a deeper understanding of the experience, a selection of six teachers were recruited for one-hour, semi-structured virtual interviews, on Zoom. Survey data was analyzed for descriptive statistics, while interviews were coded using grounded theory to establish codes and themes. Triangulation of survey and interview data established areas of consistency and checked for dissonance across reports. Findings included a pattern of systemic unpreparedness and differences in ability to respond effectively to online instruction. Furthermore, problems of equity and resource gaps across schools were exposed in traditionally underserved and marginalized populations. Teachers stressed development of relationships and concern for the well-being of their students as equally important as delivering content during this time. Yet, developing relationships and granting grace were complicated by state level grading systems that discouraged participation and attendance. Recommendations from this small exploratory study include professional development and teacher preparation placing new emphasis on technological training as an instructional platform in educational settings. Moreover, schools and districts require plans for future emergency situations at similar scale. Most significantly, we must also look to acknowledge and challenge inequities in education.

The North Carolina School Garden Network

Allie Mae Hawley (Dr. Scott Morrison) Department of Education & Wellness

School gardens are interactive, interdisciplinary spaces for transformative teaching and learning. Studies show that being outside improves attention and motivation and supports mental health (Chawla, 2015). Moreover, school gardens can be used to teach mathematics, science, social studies, and literacy (Hirschi, 2015), and to promote food justice (Gottlieb & Joshi, 2013). In this presentation, I will begin by summarizing the latest research on the affordances of spending time in nature broadly

and using school gardens in particular. Then, I will share the mission and vision for the North Carolina School Garden Network, which I created with my mentor, Dr. Scott Morrison. Extending from this work, and with the support of the Leadership Prize, I put together garden kits for 10 elementary teachers in the Alamance-Burlington School System. Each kit contains items such as children's books, professional development books, seed packets, watering cans, hand trowels, and whiteboards, all in a garden cart that can be used to take materials outside during the school day. The kits provide an infrastructure of support that is necessary for teachers to resist the status quo and explore new ways of teaching and learning. Many teachers feel constrained by standardized tests, scripted curriculum, and pacing guides, which decreases the likelihood that they will take their students outside and use school gardens. The hope is that the North Carolina School Garden Network will offer continued inspiration and motivation for teachers and administrators across the state who are interested in getting students outside.

Women's Body Perception in Outdoor Recreation

Madison A. Hayes (Dr. Carol Smith) Department of Education & Wellness

The outdoors has historically been known to be a 'man's world' (Whittington, 2006). Research since the 1980's has shown the disparity of inequality between men and women in outdoor activities (Culp, 1998), (Neill, 1996), (Whittington, 2006). Research has also shown that females participating in outdoor activities have positive benefits pertaining to improvement in mental, emotional, spiritual, and physical health (McNiel et al, 2012). However, little research has been conducted regarding body image in outdoor recreation among females. This study sought out to examine and analyze women's body perspective in outdoor recreation. A qualitative questionnaire of twenty-four questions was completed by sixty-five college-aged women enrolled at Elon University. Content analysis revealed constraints that women face in outdoor recreation, including a skewed body perspective. Results were then compared to a previous questionnaire of twenty questions completed by eight college-aged women who had returned from an Adventure-Based Learning academic study abroad course in New Zealand in 2020. A literature review was completed to identify the impact and benefits of outdoor activities for women. This study adds to the current literature base and has the opportunity to change current notions of women in outdoor recreation.

A Self-Study of Learning to Teach Elementary Mathematics Outside

Alyssa C. Herrmann (Dr. Katherine Baker) Department of Education & Wellness

This poster presentation includes a qualitative self-study that analyzes the process of learning to teach mathematics in outside spaces. The method of self-study involves systematic and thoughtful studying of the self as a teacher within a context (LaBoskey, 2004). For this research project, the teacher of self-study is a prospective elementary teacher who is minoring in adventure-based learning and environmental education. The context of this study included outdoor spaces on Elon's campus in a mathematics methods course and a fieldwork setting in an elementary school. The overarching question of the research asks, *how does a prospective teacher learn to teach math outside?* Through this question, the researcher explored how she navigated decision-making about teaching math and teaching math outside, including decisions about the mathematics content, the teaching techniques, the behavior management techniques, and the children's safety. Data sources for this study include the researcher's lesson plans, planning sessions with the math methods professor, lesson observation documentation, post-teaching conferences, post-teaching written reflections, and corresponding

elementary students' responses to the math lessons. The researcher analyzed the data through three overlapping lenses: what it means to be a teacher, what it means to be a math teacher, and what it means to a math teacher in outside spaces. These overlapping lenses acknowledge past research that teaching mathematics in reform-based ways means that teachers must reflect on their students' successes through self-observation and self-evaluation (Skinner, Louie & Baldinger, 2019). This study extends mathematics education research because it unites the area of mathematics education with adventure-based learning and environmental education, and uses outdoor spaces to teach and learn mathematics in creative ways that break the traditional mold.[SM1] Forefronting the environment in an educational space has shown to encourage pro-environmental behavior in students, which ultimately leads to more eco-conscious citizens contributing positively to protect the Earth (Steg & Vlek, 2009). Teaching in ways that value nature attend to students' social and emotional learning through environmental values. Findings from this self-study will help further both fields and support other teachers in their decisions about why and how to move math instruction to outside spaces.

Amplifying Jewish Student Voices: Exploring the Experiences of Jewish Students in Public School Settings*

Sydnie M. Holder (Prof. Erin Hone) Department of Education & Wellness

Peggy McIntosh (1989) first explored the idea of privilege (specifically white privilege), comparing it to an invisible, unearned, and unacknowledged array of benefits, with which the members of this dominant group, unknowingly walk through life. Similarly, Christian privilege grants dominance to Christians while marginalizing members of other faith-based communities and non-believers. Schools are a setting in which social norms are maintained and reproduced. Norms of Christian privilege and marginalization of members of other faith communities and non-believers in the schools are conveyed through curriculum, content, and materials, with a focus on figures, holidays, traditions, accomplishments, and the importance of European heritage and the Christian experience (Blumenfeld, 2006). Culturally sustaining pedagogy seeks to encourage and sustain linguistic, literate, and cultural pluralism as part of schooling for positive social transformation (Paris & Alim, 2017). This work calls for educators to move beyond just responding to students' languages and cultures to making them relevant in the classroom (Paris, 2012). Much of the research around culturally responsive and sustaining pedagogy focuses on the racial and ethnic aspects of culture, rather than the influence of religion within a students' in and out of school experience. This research explored the experiences of students in various North Carolina areas who identify as Jewish in a primarily Christian public school. Local high school students shared their experiences in a virtual focus group setting around the themes of minority status, precursors/attention to minority status, the role of the teacher in their experiences, and peer intent and inclusion (Dupper, Forrest-Bank, Lowry-Carusillo, 2014). Using a grounded theory approach (Glaser & Strauss, 1967), focus group responses were coded and qualitative themes emerged that centered around students' experiences. The students' narratives echoed common themes from the literature on experiences of religious minorities; indicating feelings of exclusion, alienation, lack of representation, and a desire for teachers and fellow students to be more culturally understanding. The results of this research will help draw attention to the role of religious minority voices, including how they do or do not feel validated within the public-school setting, and how school and teacher practices impact this feeling.

Exceptional Plans for Exceptional Students: Understanding Emergency Crisis Policies and Procedures

Kelly R. Hunter (Dr. Scott Morrison) Department of Education & Wellness

Schools in the United States usually have plans for emergency situations such as natural disasters (e.g., tornadoes, fires) and violence (e.g., active shooters). However, there is no national model for school-based crisis preparedness, and existing state and district plans might not even be adequate (Chung, Danielson, & Shannon, 2008; Clarke, Embury, Jones, & Yssel, 2014). Even more concerning is that students with exceptional needs "face greater challenges in the event of a crisis in school. Not all students have the skills [or abilities] to stay safe independently during a crisis" (Embury, Clarke, & Weber, 2019, p. 2). For example, children with disabilities may be unable to follow safety procedures like staying quiet, walking quickly down stairs, or hiding in a closet. In this sequential mixed-methods study (Ponce & Pagán-Maldonado, 2015), we surveyed 49 K-12 classroom teachers and special educators across the United States and interviewed 12 of them to understand their experiences with students with exceptional needs during real or simulated school-based crisis situations, the kind of training they received (if any) to meet the needs of all students during such situations, and what kind of support they need (if any) to ensure the safety of exceptional students during real or simulated school-based crisis situations. Thirty-nine percent (n = 19) of the participants felt minimally prepared or not prepared at all for crisis situations with exceptional children, 43% (n = 21) felt adequately prepared, 18% (n = 6) felt very prepared, and only one respondent (2%) felt exceptionally prepared. In our analysis of the interview data, we found three overarching themes. First, the participants felt *ill-prepared* for school-based crisis situations with exceptional children, meaning there was very minimal training. Second, they were also *mis-prepared*; that is, their training and practicing during crisis simulations was inconsistent, inauthentic, and incomplete. Third, the participants indicated that they were *pro-prepared*, meaning that they expressed an eagerness and willingness for more training, practice, and communication to ensure the safety of exceptional students during school-based crisis situations. These findings might be used to advocate for more training for teachers to ensure the safety of all students, especially those with exceptional needs.

An Analysis of Representation of East Asians and East Asian Americans in Picture Books Published Since 1990*

Erika E. Kim (Prof. Allison Bryan) Department of Education & Wellness

Through my review of picture books published from 1990 to 2020 featuring Asian/Asian American (A/AA) characters, I analyzed the portrayal of A/AA. Because the use of panethnic terms, like Asian American, generalizes experiences of diverse communities (Rodriguez 2019, p. 215), I focused on Chinese/Chinese American, Taiwanese/Taiwanese American, Korean/Korean American, and Japanese/Japanese American characters. I predicted A/AA representation would bring to light "not just the low quantity of existing literature, but also the inaccuracy and uneven quality of some of those books" (SLJ, 2019), but classrooms require a diverse collection of literature to serve as "windows, mirrors, and sliding glass doors" (Bishop, 1990). I found and acquired 100 picture books through the University and Public libraries by searching the library catalogs as well as online book lists, like Diverse Book Finder. I recorded author race/ethnicity, character race/ethnicity, language, presence of stereotypes (such as physical features or character traits) through text or illustrations, theme, storyline, interest level, and overall representation. My research found five recurring themes: 25% of the books were about culture or food, 15% grandparents, 9% New Year's celebrations, 9% folklore, and 9%

adoption. While my research reaffirmed that A/AAs are usually represented through food and celebration (Rodriguez, 2019, p. 216), I also found that many books are written about family interactions, particularly grandparents and adoption. I categorized the books into a scale similar to that of Social Justice Books, which uses a stoplight-like system of green (recommended), yellow (recommended with caution), and red (not recommended). Because of the diversity within green books, I added a green exemplar category containing high-quality books with deeper representation, end matter to contextualize the story, and connections to content. The ten books I identified as exemplars are highly recommended for instructional use. I found A/AA are more likely to be visually stereotyped through illustrations than text. An author's proximity to Asian culture corresponded with a more authentic representation. My inquiry, which determined that one book cannot accurately portray the A/AA experience, has curriculum and instruction implications for preservice and in-service teachers.

The Effect and Understanding of Trauma in Elementary Schools

Rachel A. Leonard (Dr. E. Stephen Byrd) Department of Education & Wellness

For children who have experienced trauma, any experience can bring fear and distrust (Purvis, Milton, Harlow, Paris, & Cross, 2015). Therefore, teachers and schools need to create environments in which students feel safe and supported physically, socially, emotionally, and academically (Trauma Sensitive Schools, 2017). This study sought to understand elementary school teachers' prior knowledge and experiences with students who have experienced trauma and inform future training and professional development resulting in better support for teachers and their students. Through examining existing research on trauma in schools and dialogue with professionals, a survey was created and shared on Facebook and Twitter. It included twenty questions about the teacher's demographic information, prior knowledge, and perceptions of their students, themselves, and their school communities' responses to trauma. Nine elementary school teachers from across North Carolina responded. They discussed their training, understanding, and perceptions of what still needs to be done to support students who have experienced trauma. Their responses were synthesized for connections between prior knowledge and personal experience in their classrooms and schools. The similarities and differences in their responses showed several important findings. While not all of these teachers attended training or professional development about trauma, they all had students in their classroom who experienced trauma. When asked about their confidence with children who experienced trauma, on a scale of one to ten, teachers gave a range of responses. This finding promotes the importance of teachers learning about trauma both to improve confidence and fully understand the implications of trauma on their teaching. All teachers were able to describe how trauma affected their students academically, socially, and emotionally recognizing that it impacts students differently. They also described ways they and their school communities effectively supported their students who experienced trauma. However, the majority believed their schools and teachers were not equipped to support students with trauma most effectively. Further training and professional development would allow for a greater understanding of how to implement effective strategies to meet students' unique needs and promote school-wide initiatives to support their students as a community.

Investigating Pedagogical Differences Between Montessori and Public Kindergarten Classrooms

Makenzie M. Mason (Dr. Heidi Hollingsworth) Department of Education & Wellness

This study compared the pedagogical differences between a Montessori approach and a traditional public school approach to primary education. According to the Riley Institute (2018) longitudinal study, students in the Montessori approach earned higher rates of achievement in English language arts, math, social studies, and creativity than students attending traditional public schools. This study delved into the rationale behind these findings by examining and comparing instructional methodologies implemented by teachers, and accompanying activities between the two approaches. This study used qualitative data from interviews of three Montessori kindergarten teachers and three public school kindergarten teachers in central North Carolina. The interview items each related to a specific kindergarten skill identified by the North Carolina Department of Public Instruction in the content areas of English language arts, mathematics, and health. The six participating teachers were individually interviewed and prompted for explanations and examples of how each skill is fostered in their respective classrooms in order to understand the pedagogical differences of each approach in real classrooms. The data were transcribed and coded to identify pedagogical trends and discrepancies between the two approaches. Findings from the comparison suggested trends within each targeted content area. Trends found in the area of English language arts instruction in the Montessori approach centered around manipulatives and individual sensorial connections to letters and corresponding their sounds, while the public school approach focuses on memorization of letter-sound associations. In mathematics, Montessori teachers reported additional manipulative use, in multiple representations, emphasizing natural materials. In regards to health, Montessori teachers highlighted peacemaking, while public school teachers focused on relationship-building and community. This work will inform teacher candidates of these two approaches to education, as well as provide insight for practicing teachers who might seek to integrate aspects of the Montessori approach into their traditional classroom.

Teacher Strategies for Supporting Reluctant Readers

Lana H. Newman (Prof. Marna K. Winter) Department of Education & Wellness

Reluctant readers are usually identified as struggling readers or will become struggling readers due to their lack of interest and time practicing reading (Lenters, 2006). Reluctant readers often find reading in school to be boring and not of interest to them. Students who are struggling and/or reluctant readers are often reading below their typical developing peers. It is easy for teachers to distinguish between an engaged and disengaged reader, but sometimes teachers have a more difficult time trying to figure out if a reader is reluctant to pick up a book to read, or needs additional academic support to be a successful reader. This research finding shares results of an online survey given to classroom teachers via social media and also emailed out to a local school system. Participants completed 10 short answer response questions, specifically asking how they define struggling and reluctant readers and additionally the strategies used to support both of these types of readers. The survey was completed by 41 participants, mostly from North Carolina. Initial findings show classroom teachers identify reluctant readers by behaviors that they exhibit and struggling readers are most often identified by academic performances in reading, which aligns with research. Most strategies used to engage these students are also aligned with findings such as, using one on one conferences, allowing student book choice, and matching texts to reading levels not grade levels. These findings will provide other classroom teachers with helpful strategies for discerning whether a reader is reluctant or struggling, as well as some new methods for engaging these students.

Examining Prospective Teachers' Awareness and Perceptions of Trauma-Informed Teaching Approaches*

Elizabeth H. Norvell (Dr. Katherine Baker) Department of Education & Wellness

In the context of a global pandemic and heightened awareness of racial inequities, educational research has emphasized the importance of embedding trauma awareness and sensitivity into teaching practices. The greater movement around trauma awareness is often referred to as trauma-informed care. Past research has shown that trauma and toxic stress affect almost every aspect of a child's school experience (Carello & Butler, 2015; Perfect et al, 2016). Underlying trauma can inhibit students' cognitive functions and lower academic performance (Terrasi & Crain de Galarce, 2017). However, trauma-informed care can mitigate the impacts of trauma (Udesky 2018, McInerney & McKlindon 2014); but the research base lacks teachers' insights about experiences with trauma-informed teaching approaches. Teachers' voices are needed in order to ensure sustainable, effective, and sensitive implementation of these transformative approaches. In this study, the researchers documented and examined prospective teachers' awareness levels and perceptions of trauma-informed approaches in schools. Content analysis was completed of responses from a self-designed survey that contained both closed and open items. In order to determine the extent that Elon's teacher preparation program prepares educators to teach from a trauma-informed lens, participants were prospective teachers enrolled in their senior year at Elon. Data revealed that many prospective teachers have not heard of trauma-informed teaching approaches. Of those who have, participants shared about surface-level practices and focused on behavior management techniques. Notably, all survey respondents did believe that trauma-informed teaching approaches should be taught about in teacher preparation programs. This study recommends that Elon's teacher preparation program begin preparing prospective teachers to be trauma-informed by integrating these practices throughout the entire curriculum. This study is crucial to future preparation because in order to best support and serve students, teachers should be equipped to teach through a trauma informed lens. With a trauma-informed foundation, students are more likely to feel safe and valued in their classroom, which in turn allows them to place focus on academics. On a larger scale, implications of these findings have the potential to inform education policy and future practices of teacher education programs regarding trauma informed approaches to teaching.

The Untold Stories of Desegregation: Learning from the Living Past*

Felicia Y. W. Robinson (Dr. Cherrel Miller-Dyce) Department of Education & Wellness

Currently, there is much research and conversation regarding the racialized experiences of Black students in public schools (Brown & Brown, 2012; Cokley, 2006; Saddler, 2005). One point of emphasis in the literature is the historical analysis regarding the experiences of students because of state backed systems of segregation and subsequent court-ordered desegregation (Saddler, 2005). With the death of Linda Brown, in the Brown v. Board of Education (1954) of Topeka, Kansas case, it has become more urgent to capture the experiences of Black students who experienced racial desegregation to see what can be garnered to help the teaching and learning of Black students currently. Brown v. Board of Education of Topeka, Kansas was a turning point for Black students in the education system. However, the same social and economic conditions outlined in Brown still persist today for Black students (Moore & Lewis, 2014). In addition to similar social and economic conditions, racial segregation continues to increase thus resulting in Black students disproportionately attending underfunded and under resourced schools (Moore & Lewis, 2014). In order to improve the educational

outcomes of Black students in public education today, this research sought out the voices of those who experienced desegregation to understand and learn from the experiences of Black students in the past. Interviews were conducted and coded using a Constant Comparison Analysis (Glaser and Strauss, 1967). The findings will be analyzed for central themes that will encapsulate the experiences of Black students who endured desegregation.

The Relationship Between Educator Expectations and Burnout in Special Education Teachers

Dierdre Shivak (Dr. Stephen Byrd) Department of Education & Wellness

The focus of this inquiry is special education teachers' expectations and understanding of their careers as preservice teachers and as practicing teachers, particularly looking at the relationship between expectations and occupational burnout. Research indicates that half of all educators leave the classroom within seven years of teaching and special education teachers leave within six years of teaching (Wisniewski & Gargiulo, 1997). The research also indicates that teachers may have expectations that are not met, including: levels of support from administration and colleagues, professional development opportunities, commitment levels, years in the career, and stress levels (Gersten, Keating, Yovanoff, & Harniss, 2001). My question resides in whether these expectations not being met increases symptoms and feelings of burnout. The participants in this inquiry were special education teachers from the Alamance Burlington School System who have been teaching in some capacity for five or more years. Participants are currently in the early stage of the study, which includes filling out a survey to gather information about their background and the expectations described above. The survey will further examine how those expectations relate to the realities of their careers and if they experience symptoms of burnout. Results could possibly increase understanding and awareness of occupational burnout within the field of special education. The study could further assist in developing potential strategies and supports for educators feeling the symptoms of occupational burnout.

Friendship in an Inclusive Classroom Through Meaningful Interactions

Celia Z. Skulnik (Dr. E. Stephen Byrd) Department of Education & Wellness

In recent years, inclusive education has risen in popularity (Locke, Ishijima, Kasari, & London, 2010). Parents, educators, and even students are seeing the various benefits that come from a diverse student population (Locke, Ishijima, Kasari, & London, 2010). However, the actual practice of inclusion does not always go as seemingly as it should, so that many students with disabilities are often seen as separate from their typically developing peers (DiGennero, Dusek, Laura, & Quintero, 2011). This research project examines how friendships are fostered by teachers in inclusive classrooms, and if those classroom interactions translate to social interactions outside of school. To answer this question, data for this study was collected through an online questionnaire sent to parents and teachers. Through analysis of literature related to friendship and disability, the online questionnaire was developed to address themes of school structure, confidence, and strategies. 15 parents and 14 teachers responded to the survey. All participants used similar phrases and language in their responses allowing the data to be analyzed for key themes and ideas. Results indicated that the majority of parents felt their child did not have many meaningful friendships in school. The majority of teachers; however, felt that students are given the opportunity to form meaningful friendships in the classroom with their peers. Further, the majority of the teachers reported that they did not use programs or socio-net-grams to help their students understand friendships. Teacher experience and training may be a contributing factor. The

results of this study indicate that students are not forming meaningful friendships despite the teacher's confidence that they are able to. There seems to be a disconnect between the parents' and teachers' perspectives. The research indicated that, in order to promote friendship, the inclusive model needs to change and include more teacher education on social programs and collaboration with parents. This research project has many implications, mainly the need for professional development programs that focus on ways teachers can foster meaningful friendships in inclusive classrooms across the range of ability/disability. Schools need to refocus on why inclusion is important.

Policy Effects on Teachers at Juvenile Detention Centers Across the U.S.*

Chandler A. Vaughan (Dr. Aaron Sparks & Dr. Scott Morrison) Department of Political Science & Policy Studies and Department of Education & Wellness

Both the roles of educators at juvenile correctional facilities and policymakers is critical to the long-term success of incarcerated youth. Previous research has documented the lack of resources and services in juvenile justice education (Castro & Brawn, 2017; Tannis, 2017; Department of Education, 2019). The poor educational outcomes of youth in carceral settings are far from their individual responsibility, but instead shaped at the policy level (Siegle, Walsh, Weber, 2014, Bell & Stevenson, 2006). Few studies have examined the effects that policies have on educators at juvenile correctional facilities, or the way in which educators' experiences can even inform the formulation of those policies. Utilizing the Department of Justice's five guiding principles for providing high-quality education in juvenile justice secure care settings, we are using policy feedback theory to interrogate the reciprocal relationship between juvenile justice policy and educators' practice. Preliminary research is guided by the following questions: 1) To what extent do educators perceive their facility to be meeting the guiding principles? 2) How do educators perceive the impact of that policy on their job? 3) How do these policies shape educators' political involvement? In this on-going mixed methods study, we are surveying and interviewing over 40 educators at juvenile correctional facilities across 14 states. Quantitative analyses of survey data will allow us to make broader generalizations about the impact of policy on educators and vice versa, and qualitative analysis of interview data will provide a richer understanding of how educators view their roles in juvenile correctional facilities. In order to provide a quality education to youth in alternative learning environments, educators must be on one accord and have voice within with federal guidelines. This research will allow scholars and practitioners to better understand the full impacts of policy choices, from educational outcomes, to educator efficacy, and ultimately for providing an opportunity for incarcerated children to obtain education that propels them toward future success.

Teacher Considerations Within the Inclusion Classroom*

Maddie G. Walter (Dr. Dani Lane) Department of Education & Wellness

Heightened sensory input for students with Autism Spectrum Disorder (ASD) can affect their ability to participate fully in the classroom environment. The intent of the study is to examine teacher perceptions of sensory variables and approaches for addressing sensory needs for students with ASD within the classroom environment. In working with teachers directly, this study aims to help provide feedback that can be used in future classrooms to construct a learning environment accessible to students with ASD. This study employed surveys as well as qualitative follow up interviews. The open-ended survey used in this study consisted of questions aimed at understanding the teacher's perceived impact of sensory input, behavior, and contributing materials/resources that would affect the

learning of students identified as having ASD. The interviews focused on participant's elaboration of their survey responses. Survey and interview data will be analyzed using open qualitative coding. This poster highlights data collection and preliminary results from the survey used in this study.

Philosophy in the Elementary School: A Solution for the Creativity Crisis

Abigail Maclean Wilson (Dr. Heidi Hollingsworth) Department of Education & Wellness

We are currently facing a creativity crisis, meaning that the current generation is not as creative as the generation 25 years before them (Kim, 2011). This phenomenon was discovered by Kim who analyzed the results of the Torrance Test, a widely accepted assessment of creativity, from participants across the United States with data from a range of forty years. The cause of this decline in creativity is unknown, but it has the potential for wide-scale impacts. More than ever, our fast-paced society demands a heightened level of creativity. In recent years, creativity has been named one of the most sought after skills for an employee and a leader (IBM, 2010; Nuys, 2019). How do we fill this need for creative thinkers and prepare students to enter competently into the world? A literature review was conducted, investigating philosophy discussions with elementary schoolers as a possible solution to the creativity crisis. Research on creativity indicates that creativity grows when students are faced with challenges, given opportunities to seek solutions and are prompted to critically evaluate ideas (Eragamreddy, 2013; Fisher, 2013). All of these aspects are integral parts of philosophy discussions. Utilizing the resources and trainings provided by programs, such as the Philosophy for Children movement, teachers can make philosophy a part of their classroom routine (Williams, n.d.). Doing so provides many benefits to students, including strengthening their creative thinking abilities (Education Endowment Foundation, n.d.; Fisher, 2013; Lipman, 1976). To systematically investigate the impact philosophy discussions have on students' creative thinking abilities, the Torrance Test can be used to measure students' creativity before and after a series of philosophy discussions. These scores can be compared with the scores of a control group in order to provide additional confirmation that philosophy discussions with elementary schoolers may be a powerful tool to foster creative thinking and prepare students to enter into the world. This literature review serves as a wake-up call to inform educators about the dire need to foster creativity in students and it presents the need for further research on how philosophy discussions can prompt creative thinking in students.

English

Perspective in the Pandemic: Pass/Fail Grading and Student Mental Health

Dorothy P. Boudett (Dr. Paula Patch) Department of English

This study originated as an investigation of students' perceptions of grades and alternative grading models. During the study, the university shifted to online classes as a result of the Covid pandemic. To account for the emergency shift in instruction, a Pass/Fail grading option was implemented for the Spring 2020 semester. We pivoted the research to explore the effects that a Pass/Fail grading system had on students' self-reported emotions and mental health during the "pandemic years" and to investigate the academic support students might need rather than the Pass/Fail grades they are requesting. We surveyed students who were enrolled in classes at Elon in both Spring and Fall 2020 through a convenience sample, and asked students to rate their mental health during Spring 2020 and compare their projected mental health for Fall 2021. We asked students if Pass/Fail grading could have had a positive impact on their semester, and we asked students how professors could have made online

learning more manageable. We received 83 responses from students ranging from sophomore to senior standing; all self-identified as female, and all but three self-identified as white or Caucasian. For most students, grades were very important. Almost all said that grades affect their mood, and most said that grades affect their mental health. More than half rated their mental health as poor in the spring, and about half of the students expected their mental health to be worse in the fall. Almost 40 percent of respondents opted to take at least one class pass/fail in Spring 2020; among this group, most took only one class Pass/Fail. Of students who chose to take a class Pass/Fail, most said it was for mental health reasons. Many students who did not take a class Pass/Fail still said that doing so would have been better for their mental health, and most students said that a Pass/Fail option for Fall 2020 would have a positive effect on their mental health. Outside of grades, by and large, students said a lighter course load would be beneficial to their mental wellbeing.

Maternity and the Young Voice

Annie Earnshaw (Dr. Cassie Kircher) Department of English

My creative thesis project will explore mother-daughter relationships from a variety of perspectives through the production of a fiction short story collection in the genre of young adult literary fiction. I will first read several short stories, novels, and academic articles related to the concept of mother-daughter relationships in young adult literary fiction, using literary and creative analysis to determine what key aspects are present and what fresh perspective I can provide to this discipline. I will then engage these ideas in a writing process that balances structure with creativity to craft a series of short stories. These stories will explore themes such as teen pregnancy/maternity, loss of a mother or mother figure, the impact of a "found" mother figure in place of a biological mother, and more. When collected into a 100-page collection, these stories will call attention to an aspect of young adult literary fiction that is researched, but not often applied in the mainstream young adult genre. My collection will convey fresh, unique, relevant narratives for readers who are young or young at heart, adding to the field of Creative Writing by applying literary analysis of mother-daughter relationships to a creative writing process.

"Thanks, Writing Center!": Analyzing the Workplace Writing Experiences of Writing Center Consultant Alumni

Emily P. Holland (Dr. Julia Bleakney) Department of English

My poster presentation examines how former Writing Center consultants' various writing-related experiences at Elon University function as rhetorical training (i.e. immersing students in varied writing for different audiences, purposes, and contexts) for the writing they are doing in the workplace and beyond. The research is part of a larger study conducted with Drs. Bleakney, Li Li, Jessie Moore, and Paula Rosinski and other undergraduate researchers. The team focuses on a broad range of campus-originated writing experiences, including writing courses beyond the introductory level, writing tasks for student organizations, other work-integrated learning (such as internships), and on-campus employment (such as Writing Center consulting) that prepare students for concurrent and subsequent writing tasks. Writing Center directors and their consultants have long known that consultants' work develops their writing processes, shapes how they value writing, and prepares them for the workplace based on the Peer Writing Tutor Alumni Research Project; but more empirical evidence is necessary to show how this work combines with other university writing experiences to benefit consultants long-term. To study the impact of these experiences, we surveyed Elon University students and alumni

affiliated with writing-intensive majors/minors and on-campus jobs in the fall of 2019 and received 130 responses. This presentation will focus on a subset of 40 respondents who identified as Writing Center consultant alumni, presenting analysis and implications of the initial survey results. Using an emergent coding method, we analyzed responses to questions such as their most frequently composed types of writing, their writing process, and their most valued types of writing. Qualitative data from the survey, particularly respondents' mentions of the Writing Center in the open-ended survey questions, reveals how alumni use particular Writing Center consulting techniques (e.g. reading aloud, explaining the writing process to others) in their workplace writing. This data paints a picture of the writing lives of consultant alumni, demonstrating that a variety of experiences shape their writing after college. Some aspects of this picture, such as collaboration and revision processes, stem directly from the Writing Center, and others arise from the intersection of writing center work with other university writing experiences.

Grade Relationships: How Students Feel About Grades

Grace J. Kennedy (Prof. Margaret Chapman) Department of English

Grades leave a lasting impact on students, both positively and negatively. "History and repetition tells students grades do things: they sort, they mark, they reward, and they punish" (Inman & Powell, 2018). The focus of this project is to examine how students feel about grades, what outside pressures they face, and what they think these grades are measuring. Students often are faced with pressure to succeed beyond a single class, for example, getting on the Dean's list, maintaining scholarships, or getting into graduate programs. The answer to these pressures for most students is to just get good grades. In this research, we explored how the pressures impact college-level students the most, specifically asking what students believe their grades measure and how they believe these grades will impact them later in life. This study surveyed Elon students in differing class years and majors. We analyzed that data to examine students' perceptions of grades, what outside factors impact their feelings about grades, and what they believe to be the function or measurements of grades. By participating in this study, students articulated how grades affect them and how grades make them feel. In addition to providing us with information for our research, this reflection allows for deeper thinking of why they think certain things about grades. This research will contribute to the field of education by deepening educator's understanding of how students think about grades. Educators will also be able to check if student perceptions and instructors' perceptions line up. Lastly, they will be able to educate students on how grades work and will be able to help them understand their emotions about grades.

Acknowledging and Addressing the Observed Decline in Client's Self-Esteem in the Writing Center During the COVID-19 Pandemic

Julia A. Kocsis (Dr. Julia Bleakney) Department of English

In my role as an online consultant for Elon's Center for Writing Excellence during the COVID-19 pandemic, I noticed a lack of self-esteem among many of my clients. Clients continuously apologize for their writing, tell me how bad they believe their writing is, and are fearful that I will tell their professor they came to the writing center, along with other concerning behaviors. My observations drove me to research whether the online writing center experience contributes to low self-esteem in writing center clients, or if the nature of the online format is simply revealing the pandemic's overall effect on self-esteem. Learning more about the nature of this problem is essential not only for overall well-being, but because mental health issues, like low self-esteem, are the leading impediment to

academic success (Son, Hegde, Smith, Wang, & Sasangohar, 2020). For my research, I reviewed scholarship on self-esteem and the impact of online transitions as it relates to the COVID-19 era, conducted one-to-one interviews with fellow consultants, and analyzed the results from the Elon University 2020 Fall Student Survey and the Elon University Fall 2020 Writing Center Client Survey. The Elon Student Survey inquired about the on-campus Elon experience during COVID-19 (ease of involvement, level of support, resources, etc.) in order to improve university programming. The Writing Center Survey asked students why they selected online or in-person appointments. My overall analysis suggests that students were struggling to make new social connections online and were increasingly concerned about their academic performance and abilities due to COVID-19, all negatively impacting self-esteem. In order to support students during this time, I curated helpful advice including spending extra time at the beginning of writing center sessions building rapport, having a backup system like Zoom in case of technical difficulty, finding something positive in every paper to tell the client, and planning more consultant bonding activities. Writing center consultants should pay attention to client self-esteem because helping students improve their self-images might help them become better writers (Minot & Gamble, 1991). My findings support the crucial role of nurturing client self-esteem in the writing center.

Gender, Race, and Intersectionality in Afrofuturist Short Fiction

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This project is an intersectional analysis of the representation of female-identified characters in contemporary science fiction and fantasy, also known as speculative fiction. The worlds of both short fiction and novel-length works prompt readers to look critically at our own world. Indeed, the characters' interactions with their environment and their personal agency act as entry points in studying how speculative fiction reflects, subverts, or reinforces real-world social structures. Intersectionality theory demands work at the connections between aspects of identity. This study addresses three categories which intersect with gender: age, disability, and race. While this project engages fourteen pieces of short fiction and a 450-page novel, for the purposes of SURF the presentation will focus on the strategies of an intersectional reading through two short stories. Analysis of both "The Effluent Engine" by N. K. Jemisin and "El is a Spaceship Melody" by Maurice Broaddus appear in a longer thesis chapter dedicated to the intersection of gender and Black identity in short fiction. Both pieces highlight the value of an intersectional reading when engaging with the speculative fiction subgenre of Afrofuturism. Afrofuturist stories showcase Black imaginative creativity as a response to systemic oppression through stories that question existing structures and imagine alternative realities, technologies, and social orders. With the explicit focus on gender and race, critical race theory and scholarship on Afrofuturism guides much of the analysis of these stories; however, considering additional intersections of identity and power opens further opportunities for critique and understanding. This project contributes to a growing body of scholarly research embracing intersectional literary analyses of science fiction and fantasy. Contemporary media highlight speculative fiction's relevance in popular culture, and particularly how Afrofuturism as a growing genre is reaching larger and more mainstream audiences. This project highlights the importance of engaging critically with these works and their ability to contend with social inequality through the construction of alternative settings, systems, and ways of thought.

Breaking Open the Canon: Diversifying Literature in the English Classroom*

Haley M. Love (Dr. Kim Pyne) Department of English

The literary canon in America is dominated by literature written by white males and about white experience. As American schools become more diverse, students need to interact with literature that both reflects their experiences, as well as contradicts it. The critical pedagogy approach to the classroom aims to support students who are disadvantaged by the system, particularly students of color. Darder, Baltodano and Torres (2003) explain that critical pedagogy is a method of teaching that brings different views and perspectives into the conversation, allowing educators to engage critically with the impact of capitalism, sexism and racism upon the lives of students who have been historically oppressed in American school systems. Critical pedagogy requires politicizing the classroom, allowing it to become a place for students and teachers to work through tough issues together. In order to begin the challenging sociopolitical work of critical pedagogy, teachers need access not only to new, more diverse literature, but also to critical analysis of this literature in context of the classroom from other educators and scholars. This project is a critical literary analysis of seven novels centered around characters who were written as black females who are experiencing non-heterosexual sexuality in different ways. It analyzes how this intersectional identity is represented in each text and, in response, suggests materials and approaches for teaching each of them in a critical pedagogy-oriented classroom. While this is a project looking to find new literature to add to the classroom, The Color Purple works as a comparative text, allowing comparison between the new literature I have compiled and an older, more canonical novel that explores similar themes of sexuality, race, and gender. Researching the use of The Color Purple in modern classrooms has not only acted as a guide for how this genre of text works in the class, but also revealed some of the missing pieces in the teaching of black, queer literature. The project provides suggested teaching materials, including critical thinking questions, historical/philosophical background readings, and an overview of barriers and challenges to teaching each text.

They Told Us We Were Girls: Examining the History of the U.S. Punk Music Scene's Attitudes Towards Gender, Sexuality, and Race*

Lauren A. Memery (Dr. Scott Proudfit) Department of English

Labeled a community supposedly committed to challenging the status quo, the punk music scene ironically has become notorious for silencing and gatekeeping minority voices in an attempt to maintain a culture that is cis-straight and white. This research investigated what attitudes and behaviors allowed for the scene to suppress diverse representation for so long and what work, if any, the contemporary scene is doing to counteract these historically in-group ideals. This bias continues today, ranging from the subtle suppression of minority voices to blatant violence against minority bodies. Acknowledging this decades-long misbehavior within the scene is the first step to promoting more respectful group norms for the next generation of punks. Researching the dynamics and impacts of representation and oppression in the punk scene from the 1960s to the present day consisted of dissecting lyrics and music of foundational punk performers, consulting musician/scenester biographies and their eras' cultural contexts, surveying art and scholarship on the punk scene by both punks and punk academics, and applying punk history to the current state of punk. These findings were used to inform the creation of an original television pilot titled, "They Told Us We Were Girls," a project that hopes to make this research accessible to punk and non-punk audiences. Other goals of the television pilot are to expose audiences to the stories of silenced minority punks, raise consciousness about the audiences' own issues with gender, race, and sexuality, and showcase music of diverse punk bands actively working to better the contemporary scene. This research confirmed that punk music has bred a culture that continually constructs damaging systems that condone the maltreatment of minorities. Punk systems of oppression such as the Skinhead subculture, the commercial appropriation

of Black musicality into white-washed genres such as ska, and a concert culture that's sympathetic to if not encouraging of sexual harassment and assault continues to threaten and belittle individuals who do not conform to the cis-straight white male punk stereotype. However, with continual exposure, awareness, and change, representation can and will reform the punk music scene of yesterday into one of today.

Rewriting Prevention: A Rhetorical Study of Online Sexual Assault Prevention Courses on U.S. and New Zealand College Campuses*

Angela D. Myers (Dr. Jessie Moore) Department of English

This study explores the most effective rhetorical strategies for online sexual violence prevention courses intended for college students. Research in the field of psychology informs decisions about the best content to use in such courses. However, prevention programs differ in their success due to different rhetorical decisions, such as appeals to intended audience, usability, organization of the course, use of active or passive voice, sentence structure, use of narrative, and length of course. This project fills a gap in the research by investigating the most effective rhetorical strategies for prevention programming. The two-year long research project utilized a mixed-methods approach: a rhetorical analysis of the online prevention program used at Elon, a comparative rhetorical analysis of a program used in New Zealand, and IRB-approved comparison usability testing with seventeen current college students. A rhetorical analysis examines the textual and design elements to compare them to best practices in the field of rhetoric while a usability test invites the users to participate in the research process by providing feedback on the communication in sexual violence prevention programming. By combining a traditional rhetorical analysis with comparison usability testing, the findings are not only grounded within the best rhetorical practices, such as catering your messaging to your audience, using active voice, and appealing to shared values, but also in the preferences of the target audience. The results suggest prevention courses should create a strong narrative which appeals to the users' values, include many examples of prevention, and utilize active voice. These courses should also try to address the users as bystanders and avoid using "us vs them" language or any language which could disempower the users from intervening to stop sexual violence. Prevention course creators should attend to both the sentence-level and the overarching narrative of the course to ensure students feel like they have the tools and motivation to prevent sexual violence on their campuses. When these effective rhetorical strategies are utilized throughout a prevention course, students will be more engaged and empowered through prevention programming.

Reading is Believing: The Power of Culturally Responsive Literature*

Hayley Risk (Dr. Heather Lindenman) Department of English

Research on early childhood education suggests that using culturally literate texts has tremendous potential for helping young people connect to reading and to see themselves as a part of the world (McCollins & O'Shea 2010, Mendoza & Reese 2001). Books have the power to provide young children with mirrors to see reflections of themselves, as well as windows to catch a glimpse into the culture of others (Cox & Galda 1990, Brinson 2005). For this reason, it is vital to ensure that children are provided with both windows and mirrors through the literature they receive in school settings. However, does this always happen? My research investigates this question at Elon specifically focusing on the student tutors working at the Village Project, an on campus literary initiative to help k-5 children in the Alamance Burlington community increase their literacy proficiency. The purpose of

this research is to analyze student-tutors' chosen reading materials (n=94) and interviews with student tutors (n=6) to determine whether, to what extent, and in what ways literacy tutors think about culturally responsive texts in their sessions. Student-tutors' materials were sorted using 3 codes of cultural responsiveness adapted from the Diverse Book Finder: race/culture of characters, content with regard to bi/multilingual material and diverse family structure, and category based on the role and type of diversity present in the book ie. are the BIPOC characters main characters or background characters and is the plot of the story directly tied to the identities of its characters. Interviews of student tutors revealed five major categories that influence how student tutors choose materials: reading level, tutee interest, reflection of tutee, personal past of the tutor, and diversity mindset. This study suggests that helping to foster a culturally literate mindset among tutors can support text selection. Findings from the student interviews also indicate there is more work to be done in supporting tutors as they work to locate culturally responsive materials.

Environmental Studies

Identifying Trends in Hybridization Between Native and Invasive Species

Abigail Cates, Sarah Hope Dolce, & Julia Needham (Dr. Amanda Chunco) Department of Environmental Studies

Invasive species have a large negative impact on native ecosystems and the biodiversity within. Harmful interspecific interactions between invasive and non-native species can result in severe population declines in native species. In particular, hybridization between an invasive species and a closely related native species can have a wide range of effects on native species, including population declines and genetic swamping. The rate at which species interbreed has accelerated over the last few hundred years due to human activity, especially climate change and species invasions. Identifying anthropogenically driven hybrid zones is crucial to mitigating the species decline. Here, we used a systematic literature review to identify 10x known hybrid zones between native and invasive species. We then determined biogeographic and taxonomic patterns in identified hybrid zones at a global scale. Analyzing global climate change patterns, routes of species invasions, and current species adaptions will make hybrid zone locations more visible and help identify the long-term outcomes of hybridization that are most likely for each species pair. This will be increasingly important in conservation planning.

Small Mammal Community Structure on a North Carolina Old Field Successional Plot

Emmanuela F. Salecki (Dr. Amanda Chunco & Prof. Patricia Thomas-Laemont) Department of Environmental Studies

Old field successional plots of land are an interesting area of study because the diversity of plant and animal life change depending on which period of succession you are studying. While primary succession, such as soils exposed during glacial retreats show the most dramatic changes in biodiversity over time, vegetative succession in old farm fields can also bring about a large turnover in biodiversity over a relatively short period of time. Our research focuses specifically on small mammals on old-field successional habitat. We would like to learn more about the small mammal community that exists at Elon's Loy Farm and abandoned old fields in general. The goal of this research was to examine the small mammal community in a secondary successional field in the Piedmont of North Carolina. We set up a 100 x 90-meter plot with 90 trapping stations arranged at 10m x 10m intervals at

Elon University's Loy Farm. Aluminum Sherman Folding Small Mammal Traps were used in order to capture the small mammals. Traps of three sizes (Small, Medium, and Large) were used, with medium traps at every trapping station and small and large traps interspersed throughout the field. Small traps would be either set flush with the ground or elevated on a wooden stake. These traps were placed as such in order to catch field mice, which generally jump or climb. The bait used in the traps was a mixture of creamy peanut butter and horse feed oats wrapped in wax paper into a "kiss" and hung at the back of the trap. On trap days, traps would be opened at approximately 0800 and then subsequently checked for mammals at approximately 1400 the same day. Trap number, weight, length, sex, mating condition, unique individual details, and tag number if present were recorded for each small mammal captured. New captures received an ear tag. Over a two-year period 2018-2020 we captured ~ 94 small mammals; 88 were *Sigmodon hispidus* (Hispid cotton rat), 6 were *Blarina carolinensis* (Southern short-tailed shrew), 1 *Reithrodontomys humulis* (Eastern harvest mouse).

Exercise Science

Affective Responses Before and After Two Competitive Matches in NCAA Division I Men's Soccer Athletes

Madeleine F. August (Dr. Takudzwa Madzima) Department of Exercise Science

Most modalities (e.g., aerobic and resistance) of exercise have found affective responses (pleasure-displeasure) to become more positive following activity. However, few studies have examined responses following a competitive match, which is characterized by intense bouts of exercise. Additionally, little is known about how physiological markers, such as testosterone and cortisol, may correlate to affective responses surrounding back-to-back competitive matches. **PURPOSE:** To evaluate changes in measures of affect before (PreGame) and after (PostGame) two back-to-back competitive matches separated by 72 hours, and the relationship between affect, testosterone and cortisol in Division 1 men's soccer athletes. **METHODS:** 19 soccer athletes (age: 18±1 year; body fat: 11.0±3.1%). PreGame and PostGame affect measures and salivary samples were collected one hour before the fourth and fifth game of the season, and within 15 minutes after the game's completion. The feeling scale (FS; -5 to +5) was used to assess affective valence and felt arousal scale (FAS; 1-6) to measure perceived activation. Salivary samples were analyzed via enzyme-linked immunosorbent assay (ELISA) to measure testosterone and cortisol. Analysis of variances (ANOVAs) and Pearson's correlations were used with significance accepted at $p<0.05$. **RESULTS:** A significant effect for time ($p<.001$) and game ($p=.017$) was observed for FS and FAS. Univariate analyses found that the effect for time was due to FS becoming more negative (-6.84±0.45; $p<.001$) and an increase in FAS (1.00±0.27; p=.002) from PreGame to PostGame. The game effect was due to FS being more negative for the second game (-0.82±0.29; $p=.005$). Testosterone and cortisol did not seem to be related to the affective measures in this study. **CONCLUSIONS:** The findings that affect was more negative following competition is unusual considering affect usually improves following exercise. This decrease in affect is likely due to the outcome of the competition - losing the game, which could explain affect being more negative for the second game which was an additional loss. Previous research has found testosterone to influence mood when subjects win competitions, which could explain why the relationships did not hold up in this study. Future research should continue to examine how physiological markers and winning influence affective responses.

Pilates for Breast Cancer Survivors Experiencing Cancer-Related Fatigue and Cancer-Related Cognitive Impairment

Mackenzie K. Boyd (Dr. Aaron Piepmeier) Department of Exercise Science

Cancer-related fatigue (CRF) and cognitive impairment (CRCI) are two of the most common symptoms of cancer survivors that negatively affect their quality of life. This study assessed the feasibility of conducting an online exercise study examining the relationship between acute exercise, CRF, and CRCI in breast cancer survivors. This feasibility study helped identify barriers to recruitment and retention, determine the acceptability of an acute bout of moderate intensity aerobic exercise, Pilates, for breast cancer survivors, and provide data for use in designing a subsequent randomized, controlled, repeated measures, online crossover study that is sufficiently powered to examine efficacy. The long-term goal of this research was to create and test a method of investigation to reduce CRF and CRCI in breast cancer survivors using Pilates. The intended result was an immediate therapeutic relief from CRF and CRCI, thus improving quality of life. Using the online platform Gorilla, this study had a randomized, crossover, control design that consisted of questionnaires, an exercise and control condition, and cognitive games. A total of 8 participants were recruited with 2 participants completing the study. Participants ranked their fatigue on a scale (0-10) before and after exercise/control, and rated their perceived exertion (RPE) on a scale (6-20) after exercise/control. The recruitment goal of 12 participants was not attained. The exclusion/inclusion criteria were modified during recruitment to allow for more people to qualify, but online recruitment still posed a challenge. In addition, technical difficulties within the platform Gorilla caused multiple issues, requiring participants to restart the study. Future directions include fine-tuning the current study to create more refined studies and conducting a subsequent efficacy trial.

Not Just For Dancing?: A Content Analysis of Concussion and Head Injury Videos on TikTok

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Social media platforms are an accessible and increasingly used way for the public to gather healthcare-related information, including on sports injuries. “TikTok” is currently one of the fastest-growing social media platforms worldwide, and it is particularly popular amongst adolescents and young adults (Social Media Users, n.d.). To watch a video on a specific topic area, a ‘keyword’ of interest is entered into the search bar.The widespread use and popularity of TikTok suggests that this platform has potential to be a source for healthcare information for younger individuals. This exploratory study used a systematic search strategy to understand more about how concussion is being portrayed through TikTok videos. Using the keywords “concussion” and “head injury”, 200 videos were downloaded from TikTok and 43 videos were excluded. The exclusion criteria involved videos that were unrelated to concussion or head injury. These videos were either deleted, in another language, involved pets, or had multiple videos from the same account. Of the 92 videos retrieved using the keyword “concussion”, 95% (n= 88) had more than 100,000 views and 6%, (n=10) videos had been viewed more than 10 million times. With the key word ‘head injury’, n=30 (46%) had more than 100,000 views and n=4 (6%) had between 1 and 10 million views. Over half (54%, n=50) of the “concussion” videos depicted individuals “playing around” and getting hit in the head, whilst only 1% (n=1) of all TikTok videos categorized as “explaining concussion facts”. Under the keyword ‘head injury’, 38% (n=25) were videos of users explaining a ‘personal story or situation’ and 3% (n=2) were ‘explaining concussion facts’. The few videos that displayed educational information were widely viewed as well. Of the 3 total videos that were under the ‘educational’ category, the highest viewed video had 1.2m

views. The large numbers of views of concussion-related TikTok videos demonstrates the popularity of this platform, and indicates that healthcare organizations should consider TikTok as a viable means for concussion education amongst younger individuals.

Mental Health and Student-Athletes: Actual and Perceived Barriers to Help-Seeking Behavior

Sarah N. DeSordi & Emma M. McCabe (Dr. Aaron Piepmeier) Department of Exercise Science

Student-athletes are more likely to develop mental illness than the general population (Campbell et al., 2018; Moreland et al., 2018). Pressure to perform results in athletes playing through both physical and mental injuries (Bauman, 2016; Wiese-Bjornstal et al., 1998). Despite the high number of athletes who report needing mental health support, fewer than half seek out mental health services (Moore, 2017). Research has identified stigma as one of the largest barriers to mental health help-seeking behavior (HSB) (Castaldelli-Maia et al., 2019; Chapin & McClure, 2020; Cutler & Dwyer, 2020; Moore, 2017). Though stigma has been discussed in sport culture, few studies have explored stigma as a HSB barrier (Kaier et al., 2015). This study compares athletes' personal HSB stigma with their perceived public HSB stigma (i.e. what others think). We hypothesize that athletes' personal HSB stigma will be less than their perceived public HSB stigma. Data collection is ongoing. Currently, n=11 athletes have completed the online Qualtrics Survey which includes Link's Perceived Discrimination and Devaluation Scale, the Mental Health Literacy Scale, Self-Stigma of Seeking Help Scale, Help Seeking Questionnaire, and Student-Athlete Role Behaviors Questionnaire. Results from this study may help implement mental health interventions to improve mental health HSB among student-athletes.

The Effect of Music Therapy on Motor Movement

Katherine A. Griffin (Dr. Caroline Ketcham) Department of Exercise Science

An expanding literature based on developmental disorders, specifically Autism Spectrum Disorder, has provided deeper insight into diagnosis prevalence, new measurement tools, and evidence-based treatment options. For example, equine therapy, an intervention method involving activities with horses, has proven to help individuals with Autism Spectrum Disorder (ASD) improve social communication skills, as well as behavioral and sensorimotor skills (Srinivasan, 2018). While many recent studies have examined the effects of music therapy interventions for individuals with ASD, minimal research has been conducted pertaining to the motor improvement and capabilities of this type of treatment. The objective of this study is to investigate the relationship between music therapy intervention and motor movement for students with developmental disability. Music therapy sessions range from listening to music, to playing instruments, and/or composing music. Understanding how music therapy may improve motor skills is important in order to expand clinical knowledge and inform future research. We administered a 34-question online survey to members of the organization Voices Together, as well as other professionals working with individuals with ASD, through a voluntary recruitment sample (N = 50-100). The majority of the students being observed range from ages 5-12. The impact of music therapy practice for individuals with developmental disability in areas such as physical, emotional, social, and behavioral will be discussed. Based on prior research, we hypothesize that this research will provide insight into the lasting physical effects of music therapy on the given population. Professionals in this field have a good understanding of providing services for individuals with ASD but would benefit from advanced progress reports that include motor and behavioral control.

The Effects of Tart Cherry Juice and Whey Protein on Recovery Following Exercise Induced Muscle Damage

Hailey E. Jurgens & Sara A. Higgins (Dr. Svetlana Nepocatych & Dr. Takudzwa Madzima) Department of Exercise Science

Exercise-induced muscle damage (EIMD) occurs after unfamiliar exercise involving muscle lengthening and may include reduced muscle excitation and contraction, inflammation, and muscle protein loss (Clarkson & Hubal, 2002; Baumert, Lake, Stewart, Drust, & Erskine, 2016). Nutritional support has been used to assist in the recovery of EIMD because deficiencies of protein and other nutrients can negatively impact the recovery process (Tipton, 2015). Tart Cherries have many different polyphenols which have been found to decrease inflammation (Shukitt-Hale, Kelly, Bielinski, & Fisher, 2016). Daily consumption of tart cherries can mediate inflammatory and oxidative responses to EIMD, leading to faster recovery (Assumpção, Lima, Oliveira, Greco, & Denadai, 2013). No studies to date have investigated the effects of combining whey protein with tart cherry on recovery from EIMD. The purpose is to examine the effects of tart cherry juice and whey protein on measures of recovery following fatiguing forearm exercises. Nine recreationally active women (age: 21±1yr; BMI: 22.9±2.9 kg/m^2) were randomly assigned to either one of two supplemental protocols (S1: 2x8 oz tart cherry juice + 30 g whey protein (WP)/day or S2: 30 g WP/day) for 3 days. Testing and exercises were completed over virtual video calls. Participants completed 3 sets of 7 hand, wrist, and forearm exercises until fatigue with 60 s rest in between. Hand-grip strength, wrist circumference (WC), perceived recovery (PRS), fatigue, and muscle soreness (MS) were measured at pre-, 0, 24, 48, and 72h post-exercise. ANOVAs were used for analyses. Significance was set at $p<0.05$. No significant ($p>0.05$) time or supplement effect was observed in PRS, WC, or handgrip strength (29±7, 25±4, 29±6, 29±7, 30±6 and 30±6, 23±5, 27±7, 29±6, 29±9 kg) between S1 and S2 at pre-, 0, 24, 48 or 72h post-exercise, respectively. A significant interaction ($p=0.01$) in fatigue between S1 (3.3± 1.6, 4.6±1.4, 3.4±1.9, 3.9±2.2, 2.9±1.9) and S2 (3.9±2.2, 4.5±1.6, 3.3±2.3, 4.1±1.6, 4.6±1.4) at pre-, 0, 24, 48, or 72h post-exercise was observed. Preliminary data indicates that the supplementation of tart cherry juice and WP following fatiguing forearm exercise could be used to reduce perception of fatigue but not perceived muscle soreness or improve handgrip performance.

The Effects of Pilates and White Noise on Attention in College Students with ADHD*

Emily Kibler (Dr. Aaron Piepmeier) Department of Exercise Science

An estimated 2-8% of college students are diagnosed with Attention-Deficit Hyperactivity Disorder (ADHD) (DuPaul et al., 2009). College students with ADHD perform worse on executive functioning tasks compared to those without ADHD. This difference in cognitive performance may lead to the reported poor academic performance among students with ADHD. College students with ADHD have reported difficulty managing their attentional resources and focusing on academic work. While medication is the most common therapy for those with ADHD, the side-effects and cost of medicine suggest that behavioral strategies are needed to address the symptoms of ADHD. Studies have investigated how a cognitive distraction (i.e. background white noise) improves attentional processing of people with ADHD. A single bout of exercise has also been shown to benefit cognitive performance in this population. Preliminary research into the effects of Pilates on cognition shows a positive relationship in multiple populations (Multiple Sclerosis, middle-aged adults, older adults, and college students). However, no studies have investigated the role of an acute Pilates session plus a cognitive distraction on cognitive performance in people with ADHD. The purpose of this online study is to

gather preliminary data on the feasibility and acceptability of an acute Pilates session plus cognitive distraction on cognitive performance in college students with ADHD. This study is currently in the recruiting phase. We will use a randomized control crossover study design (Enrollment Goal N=12). The exercise condition will consist of participants following along to (exercise) or watching (control) an online Pilates video. The cognitive distraction condition will consist of four levels of white noise volume (no noise, low volume, moderate volume, high volume). This feasibility study will allow for the evaluation of recruitment, retention, and the acceptability of the study. Results from this study will be used to refine hypotheses and design a study powered to assess efficacy.

Yoga and Fatigue in Breast Cancer Survivors: An Online Feasibility and Efficacy Study

Hannah G. King (Dr. Aaron T. Piepmeier) Department of Exercise Science

An estimated 70% of cancer survivors experience cancer-related fatigue (CRF). CRF includes physical, mental, and emotional exhaustion that impedes daily function, does not improve with sleep, and has negative implications on overall quality of life. Research shows that when practiced regularly, yoga reduces CRF. However, no studies have been performed to explore the feasibility and efficacy of an online-based yoga intervention for breast cancer survivors with CRF. The objective of this study is to determine the feasibility and efficacy of an online-based yoga intervention for adults with CRF who have completed treatment of breast cancer. This study will have two phases. Phase one will assess the feasibility, and phase two will assess the efficacy of a 4-week online-based yoga intervention for breast cancer survivors experiencing CRF. Feasibility outcomes will include barriers to recruitment and retention, and efficacy outcomes will include CRF and health-related quality of life. This study will 1.) provide information to help elucidate the role of exercise on improving cancer-related fatigue, 2.) assess the feasibility of a highly accessible, and scalable, exercise intervention, and 3.) provide additional information pertaining to the benefits of yoga for cancer survivors. Current status of study: recruiting Phase one.

Perspectives on the Relationship Between Nutrition and Mental Health within NCAA Division I Collegiate Athletic Programs

Emma M. McCabe (Dr. Caroline Ketcham & Dr. Eric Hall) Department of Exercise Science

Research has shown a strong relationship between nutrition and mental health (Firth et al., 2020; Owen & Corfe, 2017; Rucklidge et al., 2016). Packed schedules and little rest time may make student-athletes more susceptible to mental health issues than the general population, but few athletes are fully aware of the effects that nutrition can have on their mental health (Abbey et al., 2017; Parks et al., 2016). While collegiate athletic programs are beginning to recognize the individual contributions of nutrition and mental health to performance, and are hiring sport dietitians and psychologists for their athletes, it is unclear whether these topics are ever discussed within the same context (Parks et al, 2016; Rudick & Dannels, 2018). The goal of this study was to understand the perspectives of different athletic personnel on the relationship between nutrition and mental health. 17 athletic personnel (11 Female, 6 Male) from 6 NCAA Division I universities were recruited for a 30-45 minute semi-structured WebEx interview. Interviewees included Athletic Trainers, Coaches, Sports Dietitians, Sports Psychologists, Strength & Conditioning Coaches and Sports Physicians. Interviewees were asked questions about their educational backgrounds, resources and perspectives on the integration of nutrition and mental health in their programs. All interviewees reported a need for greater monetary resources and staffing. Over half (around 59 percent) of the interviewees felt they had little more than

general or personal interest-level knowledge on topics pertaining to nutrition or mental health, with the exception of sports dietitians or psychologists. Each school varied in the degree to which their athletic staff regularly communicated about their work and athlete health statuses. Athletes were reportedly more or less likely to utilize the resources provided depending on coach attitudes toward nutrition or mental health. Regardless of size, reputation and annual spending, each university was reported to be in the early stages of integrating nutrition and mental health programs into their existing athletic departments. Implications of this work could be to help schools plan for ways to reallocate funding for nutrition or mental health programming.

Using Personality and Temperament to Predict Exercise Behavior: A Pilot Study of the Braverman Nature Assessment

Ben M. Rosicky (Dr. Eric Hall) Department of Exercise Science

The Braverman Nature Assessment (BNA) is intended to determine the dominant monoamine neurochemical that drives an individual's temperament and behavior. The study measure has been colloquially praised for the ability to determine the most effective exercise protocols for an individual based on their "dominant nature". This study seeks to examine the proposed relationship between the results of the novel BNA and exercise behaviors. Seventy-two adults (56 females) between ages 18-65 (mean = 26) completed an online survey consisting of the BNA, Godin Leisure Time Exercise Questionnaire (GLTEQ), and Aerobics Center Longitudinal Study Physical Activity Questionnaire (ACLSPAQ). Dopamine, Acetylcholine, and Serotonin Nature scores (via BNA) showed positive correlations to total METS (GLTEQ) (r=.267, p=.03). Serotonin nature had positive correlation with participation in aerobic and resistance exercise (r=.522 p=.003, and r=.512 p=.002). Acetylcholine nature had negative correlations with participation in jogging and moderate intensity sports (r=-.424 p=.003, and r=-.484 p=.012). Deficiencies in each of the four natures were associated with negative correlations to multiple forms of aerobic exercise. The BNA demonstrates some low to moderate correlations between neurochemical scores and exercise behaviors such as preference for various exercise modalities. GABA was the only neurochemical with no significant correlation to total reported exercise (via GLTEQ). There is preliminary evidence to suggest that the BNA may be a useful tool for exercise prescription based on correlations between temperament and exercise behavior found in this study.

Behavior Change Trajectories and Metabolic Syndrome Risk Factor Clustering During the Transition to College: A Pilot Study

Alexandra N. Smith (Dr. Simon Higgins) Department of Exercise Science

Metabolic syndrome (MetS) is a clustering of cardiometabolic risk factors including high blood pressure, abdominal obesity, low levels of high-density lipoprotein cholesterol (HDL), elevated triglycerides, and high fasting blood glucose that increase the lifetime risk of cardiovascular disease. The prevalence of MetS risk factors is growing in youth and young adults. Moreover, the transition from high school to college is associated with adverse lifestyle-related behavior change that may contribute to risk factor development. However, the relationship between adolescent MetS risk status and transition-related behavior change is unknown. This prospective study aimed to, a) describe the relationship between MetS risk status and transition-related behavior change trajectories in college-bound high school students, and b) assess the feasibility of the study design prior to implementation in a larger sample. Participants (n=21, 18.3±0.3 y/o) were assessed for traditional MetS risk factors

during their last semester of high school. Self-report behavioral data, including dietary habits, physical activity, sleep, stress, and alcohol consumption were collected at baseline and twice more throughout the first year of college. Linear mixed models revealed drastic increases in alcohol consumption (β=0.39, p<0.001) and apparent decreases in moderate-vigorous physical activity (β=-0.15, p=0.185) across the college transition. Furthermore, 47.6% of students had at least one MetS risk factor at baseline, and those with a greater number of risk factors experienced steeper alcohol-related behavior change trajectories (β=0.29, p=0.023). These findings highlight the importance of primordial prevention strategies to prevent MetS risk development during youth, given the potential relationship with future behavioral trajectories. Future research should aim to characterize this relationship using comprehensive, longitudinal measures that span the college transition in large, diverse samples.

The Effect of Content Based Activity Breaks on Lesson Engagement in Male and Female Students in the 5th and 7th Grade

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Student engagement in classroom instruction has been the subject of much investigation. The use of physical activity to enhance engagement is of particular interest. Research data on the effects of classroom based physical activity on measures of academic achievement suggest that it is effective in enhancing student enjoyment (Vazou and Smiley-Oyen, 2014) and cognitive function (Hill et al, 2010), as well as in increasing student attention (Palmer et al., 2013), all of which can be considered general components of engagement. However, there have been relatively few studies that incorporate current lesson content into these activities. The purpose of this study is to examine the impact of participation in a cognitively demanding, content-based physical activity task on engagement. Parental consent and student assent was collected on 26 5^{th}(N=12) and 7^{th} (N=14) grade students (N_{male}=11). The students completed this study in their Spanish course over a 2 week period (3 classes/week) using their weekly vocabulary words as the course related content for the experimental week. During week 1, students performed step jacks (jumping jacks without the jump) to a metronome beat of 100 while working in two teams and responding one by one to a prompted English translation by providing the appropriate vocabulary word in Spanish until all vocabulary words for the week were reviewed. At the end of each class, students responded to 9 questions using a Likert scale to indicate their current level of engagement in their Spanish class. The second week, students responded to the same questions after each Spanish class in its typical format (no physical activity). Data analysis suggests no significant differences for engagement between the experimental (33.46 $\pm$ 1.20) and typical (33.29 $\pm$ 1.19) conditions for all students ($p=0.36$). When isolated, data from 7th grade students approached significance in favor of the experimental week ($p=0.06$). Limitations include the small sample size and the brevity of the activity intervention (<5min). Many questions remain as to the efficacy of content based physical activity on engagement.

The Relationship Between Body Image and Mental Health in Undergraduate Students

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Body image is a significant issue in today's society, especially in college students. The purpose of this study was to examine the relationship between physical activity, body image, and mental health in undergraduate students. The participants included 111 undergraduate students from Elon University ranging from first-year to fourth-year students. Each participant was asked to complete an online survey to measure their body images and mental health. The Multidimensional Body-Self Relations

Questionnaire (MBSRQ), a 69-item scale consisting of 10 subscales, was used to measure body image. Mental health was measured in terms of depression, anxiety, and wellbeing using the Patient Health Questionnaire-9 (PHQ-9), the General Anxiety Disorder-7 (GAD-7), and the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS), respectively. The results indicated that there was a moderately strong positive correlation between the Body Areas Satisfaction Scale (BASS) and wellbeing ($r = 0.609$, $p < 0.001$), and a moderately strong negative correlation between the BASS and depression ($r = -0.602$, $p < 0.001$). A negative correlation was also seen between the BASS and anxiety ($r = -0.481$, $p < 0.001$). This study also found a moderate positive correlation between the Appearance Evaluation Scale and wellbeing ($r = 0.532$, $p < 0.001$). There was a negative correlation between the Appearance Evaluation Scale and both depression and anxiety ($r = -0.462$, $p < 0.001$; $r = -0.345$, $p < 0.001$; respectively). Lastly, similar results were seen for the Health Evaluation Scale. There was a positive correlation between the Health Evaluation Scale and wellbeing ($r = 0.427$, $p < 0.001$) and a negative correlation between the Health Evaluation Scale and both depression and anxiety ($r = -0.463$, $p < 0.001$; $r = -0.497$, $p < 0.001$; respectively). The results of this study suggested that, in undergraduate students, there is a positive relationship between body image and mental health. Further data analysis must be completed to determine whether physical activity is related to body image and mental health.

Acute Affective and Lymphedema Responses to Resistance Exercise at Various Intensities in Breast Cancer Survivors

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Exercise intensity is a determining factor for providing a stimulus sufficient enough to elicit positive physiological outcomes in healthy adults and perhaps breast cancer survivors (BCS). Until recently, higher intensities have not been prescribed to BCS because in the past clinical practice advised BCS to avoid lifting heavy objects with the side of the body affected by breast cancer. The purpose of this study was to examine the effects of an acute bout of resistance exercise (RE) at a moderate (MOD), high (HI) or self-selected (SS) intensity on affect (feelings of pleasure and displeasure) and arm volumes (an indicator of lymphedema) in BCS. Following familiarization sessions, 8 female BCS (age: 56±5 years) were randomly assigned to exercise at MOD (60% of 1-RM for 3 sets of 12 repetitions), HI (85% of 1-RM for 5 sets of 5 repetitions) or a SS weight (3 sets of 12 repetitions) in a counterbalanced fashion. Affect was measured using the feeling scale (FS; -5 to +5) and felt arousal scale (FAS; 0-6). Arm circumferences were measured to calculate the percent difference between the surgically involved and uninvolved arms that had lymph nodes removed. All variables were measured at baseline, immediately after RE, 30-minutes post, and 60-minutes post RE. ANOVAs were used. Significance was set at 0.05. There were no condition x time interactions for any of the variables. Across intensities, feelings of pleasure were significantly lower between shoulder press and all other exercises in the session (p=0.013). Although not statistically significant, feelings of pleasure were higher 30 minutes after MOD (4.00±0.26) and HI (4.00± 0.26) when compared to SS (3.00±0.86) and remained elevated at 60 minutes. The percent difference in arm volumes was similar between MOD (7.34±1.09%), HI (7.69±1.56%) and SS (7.81±1.44; $p>0.05$). Our preliminary findings suggest that an acute bout of RE at 60-85% of 1-RM elicits similar affective responses in BCS and does not exacerbate indicators of lymphedema.

Athletic Coaches' Perceptions of the NFHS Captain's Leadership Course

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The development of athlete leadership skills is a highly valued outcome in sport. However, many athletes are not given leadership training from their coaches (Gould & Voelker, 2012). Lack of time

and resources often inhibit coaches from developing leadership skills in their athletes. This is problematic as Gould and Voelker (2012) highlight the need for intentionality in building young athlete's leadership skills. One resource that helps coaches to develop leadership in a time efficient way is the National Federation of State High School Associations (NFHS) Captains Course. Walker and Gould (2020) evaluated the perceived value and effectiveness of the NFHS course to the athletes who took it. The course was found to be moderately to very useful in preparing them to be a team captain. The athletes were primarily directed to the course by the coach, but Walker and Gould (2020) offered little information regarding how the coach became aware of or used the course. As such, the purposes of this study were to examine: 1) how coaches became aware of the NFHS course, 2) their overall perceptions of the value of the course, and 3) how they used the course with their athletes. Since research literature reflects that the knowledge and use of various life skill development resources is often spread in coach education networks (e.g., peer to peer) (Santos et al., 2018; Walker et al. 2018), a theoretical veil of Diffusion Theory was used to guide a mixed method survey protocol (Dearing, 2008). Participants eligible for this study were coaches who had completed the NFHS course online and/or used the course with their teams. Coaches were sent an electronic survey with questions addressing the study purposes and given a chance to express interest in a follow-up qualitative interview to probe further into how they used the NFHS course with their athletes. Survey data was analyzed to provide a descriptive picture of course use and thematic analysis was used to analyze qualitative interviews. This study adds valuable understanding to how coaches use life skill development resources, like leadership training, to enhance psychosocial development of youth athletes within sport.

Effects of Workplace Stress, Perceived Stress, and Burnout on Collegiate Coach Mental Health Outcomes

Simon A. Wright (Dr. Eric Hall & Dr. Lauren Walker) Department of Exercise Science

Given the continuously changing job demands of coaches, coach burnout continues to be an important area of study. Coaching literature often highlights the role occupational stressors (management cohesion, pressure, expectation, responsibilities to their athletes) play in the development and management of burnout (e.g., Lee & Chelladurai, 2018; Madigan et al., 2019). However, Olusoga et al. (2019), highlighted the potential need for the field to differentiate between feelings of burnout from those of other sub-clinical mental health indicators (e.g. anxiety, depression). This study sought to examine the relationship between workplace stress, perceived stress, coach burnout, coach well-being, and sub-clinical health issues (anxiety, stress, depression). One hundred forty-four NCAA collegiate coaches from a wide range of sports in North Carolina completed online questionnaires measuring the proposed variables. Structural equation modeling was used to test the proposed hypothesis that burnout would serve as a partial mediator between workplace and perceived stress and mental health indicators (e.g., depression, anxiety, stress, and coach well-being). The model showed an acceptable fit to the data; while chi-square (χ^2 = 10.662, p =.0585) and RMSEA (.089) values did not reflect a good fit, CFI (.990) and TLI (.948) reflected good fit according to accepted recommendations in the field. Workplace stress and perceived stress were positively associated with both burnout subscales. Additionally, perceived stress alone exhibited a positive association with depression, anxiety, and stress and a negative association with well-being. While there was a positive significant relationship between disengagement and depression in the model and a negative significant relationship between disengagement and well-being, most relationships between the two burnout subscales and mental health outcomes were negligible. As such, it can be concluded that while workplace and perceived life stressors may impact feelings of burnout and mental health indicators directly, burnout does not appear

to exhibit a strong effect on perceptions of mental health and well-being. As such, in line Olusoga et al. (2019), it may be worth considering whether burnout should be considered another type of clinical mental health issue instead of as a direct contributor to coach mental health.

Finance

Corporate Social Responsibility and Trade Credit Policy

Andrew M. Jackson (Dr. Chris Harris) Department of Finance

Recent literature has examined the impact of corporate social responsibility (CSR) on trade credit as a result of higher cash holdings associated with high CSR companies (Cheung & Pok, 2019). Our addition to the research examines the relationship of CSR between companies that extend greater trade credit offerings and those with fewer trade credit offerings. Trade credit is a widely used form of short-term loans in order to delay payment for immediate goods and is recorded in the balance sheet of a company as accounts payable and accounts receivable. In addition, this paper examines the relationship between different aspects of CSR (Environment, community, human rights, employee relations, diversity, production quality, and governance) and the levels of trade credit offerings. The research uses a fixed effect multiple regression on panel data for US public firms from 1991-2015 gathered from Compustat, as well as CSR data gathered from the MSCI database. The results suggest that for companies that extend significant amounts of trade credit there is a strong positive relationship between the amount of trade credit extended and governance and employee relations CSR scores. In addition, there is a strong negative relationship between the amount of trade credit extension and environmental scores. This supports the relationship theory of trade credit in that companies may give out greater trade credit in order to build their image in the business community. This study hopes to contribute to the existing literature by providing a new theory for the extension of trade credit as a moral obligation to maintain consistency with a firm's CSR reputation and maintain important inter-business relationships.

Investigating the Impact of Investor Attention on Volatility and Volume of Cryptocurrencies and Stablecoins

Matthew H. Mitten (Dr. Chris Harris) Department of Finance

This study aims to better understand factors that affect cryptocurrency prices, specifically for stablecoins. A cryptocurrency is a digital currency, and a stablecoin is a type of cryptocurrency that is backed by another asset. Examples include stablecoins such as Tether, which is set up such that 1 Tether is always worth $1 U.S. Dollar, or PAX Gold, which is set up such that 1 PAX Gold token is always worth the same amount as 1 ounce of gold. Investor attention, measured by internet mentions in this study, has been shown to increase trading volume for Bitcoin; however, the effects of investor attention on stablecoin metrics are largely unknown. My findings show how certain stablecoins are affected by external factors. I examine factors that influence price movements in cryptocurrencies, such as investor attention and other macroeconomic variables, for ten stablecoins and three non-stablecoins, including Bitcoin. Specifically, the effects of investor attention and investor sentiment on volatility and volume are investigated. I analyze the data using a fixed-effect regression model. I hypothesize that the volatility and volume of stablecoins would be affected by fewer external factors than the non-stablecoins because they are linked to another asset. Results show a difference in the effect that investor attention and investor sentiment have on stablecoins and non-stablecoins.

Stablecoins are less volatile and their volatility is influenced by fewer factors than their non-stablecoin counterparts. In addition, for more than half the cryptocurrencies and stablecoins studied, I find that past trading volume has an impact on current investor attention. Moreover, past investor attention has an impact on current volume. Lastly, the volume and volatility of the gold-based stablecoins are affected by fewer factors than the dollar-based stablecoins.

History and Geography

Making and Unmaking Memory: University Student Protest in Pinochet's Chile

India L. Kirssin (Dr. Michael Matthews) Department of History & Geography and International & Global Studies Program

This project examines how university students and the military junta created conflicting narratives and memories from 1983 to 1986 about the Chilean dictatorship of Augusto Pinochet (1973-1990). It specifically seeks to answer the following questions: how did Chilean university students utilize protest to contest the discourse and narrative formed by the Chilean military junta? How did this protest spur greater society into creating an opposing narrative that shaped the collective memory of Chileans? It analyzes the organizational structures and events used by student leaders and participants to argue that they built a successful movement against the military junta central to the larger national movement that peacefully voted Pinochet out of power in 1989. This study explores how students contested the junta's official narrative and shaped Chileans' collective memory and national identity by examining newspaper articles from the *Fortín Mapocho* (1983-86), internal University of Chile student federation (FECH) memos, and university student interviews. It also utilizes current literature about memory, narrative, and the actors in the fight to re-democratize Chile such as Steve J. Stern's *Battling for the Hearts and Minds: Memory Struggles in Pinochet's Chile, 1973-1988.* It offers insights into the organization of student protest in an authoritarian context and the role of competing narratives in forming social memory. In so doing, it contends that through the development of student organizations and protests, university students successfully employed oppositional language to create a collective memory that contested the regime's official narrative.

"Power for the People" or an "Eternal Quest for Power?": Race, Class and Democracy in Hugo Chávez's Venezuela*

Molly L. Logan (Dr. Michael Matthews) Department of History & Geography and International & Global Studies Program

The presidency of Hugo Chávez (1999-2013) marked a controversial shift in Venezuelan politics. While Venezuela had been regarded as a thriving democracy for the majority of the twentieth century, Chávez's administration challenged traditional notions of liberal democracy, in particular questioning democracy's relationship to race and class. In January of 2005, Chávez announced his vision of "socialism for the twenty-first century," which he also labeled the Bolivarian Revolution. Chávez proposed that this modern socialism would be unlike Soviet communism due to its democratic incorporation of all Venezuelans, whether wealthy, poor, white, *mestizo*, or black. This project poses the central question: How did Venezuelan perceptions of race, and relatedly class, shape definitions of democracy under Hugo Chávez? Analyzing Chávez's speeches, human rights reports, nongovernmental organization (NGO) data, and government and opposition media, this research uncovers two conflicting narratives. The first assumes a traditional, Western definition of democracy,

in which the absolute freedom of the individual and the market is emphasized. Citing his attacks on the media, nationalization of industry, and attempts to suppress political opponents while expanding his own power, critics denounced the president's commitment to democracy (Marcano and Barrera 2007, Canache 2002). The second narrative suggests an alternative conceptualization of a more social democracy, in which racial and economic equity are foundational. Supporters praised Chávez for stimulating a national discourse on social inequality, and particularly for engaging a discussion on Venezuela's complex, yet largely-avoided racial history (Jones 2008, Bruce 2008). He further implemented national social programs that sought to alleviate the consequences of economic and racial marginalization. This project argues that Chávez's Bolivarian Revolution succeeded in incorporating the masses and empowering the historically disenfranchised, making democracy accessible to those who had been excluded for years. While the shortcomings of Chávez's vision are evident in the modern day, the reconceptualization of social democracy reflected in his administration necessitates an ongoing analysis of the interconnections between race, class, and political participation.

The Teaching of Slavery in Public Schools and the Resources Available to Educators*

Sara I. Mason (Dr. Jim Bisset) Department of History & Geography

Historians recognize that America's troubling legacy of slavery and racism dates to its very origins, and that centuries of exploitation based on race have enduring consequences. This uncomfortable legacy makes it difficult to teach slavery in high school history classrooms, a difficulty compounded by the limitations of the content provided in pre-adopted textbooks and the supplemental materials included with those books. This study will begin by analyzing how the most widely adopted high school textbooks in America deal with slavery. The textbooks analyzed were collected from a list of college level textbooks for high school students provided by the American Textbook Council (American Textbook Council, 2018). We used both a rubric created by Tolerance.org and a personally created form which examines word usage, diversity, primary source usage, and overall content related to the topic to analyze and rank the level of sophistication of textbooks' treatment of slavery. The study will also survey teachers in two different states to determine which textbooks and supplemental resources they use and how much freedom they have in choosing those resources. I will conduct this survey of history or social studies teachers in public high schools through my connections with the School of Education at Elon. Preliminary results show that the American history textbooks analyzed have a low amount of content related to the topic of slavery. In analyzing the textbooks, it is also clear that first person language such as enslaved person is used infrequently compared to the word slave. At the end of the study, the results of our analysis of textbooks and supplemental resources will be shared with educators in the systems. The importance of this study is to help teachers assess the effectiveness of the resources they currently use and offer insight into additional resources that address slavery in a more mature way.

Materiality and Sensorial Experience at the Church of Orsanmichele

Rebekah J. Maupin (Dr. Evan Gatti) Department of History & Geography

In the last decade, scholars of medieval art have examined how the materiality of religious objects, such as reliquaries, architecture, and altars, was seen to increase the sacredness of the rituals in which they were used. Christians in the Middle Ages understood that objects had the potential to move from the material (such as glass, gems, or gold) to the immaterial (the divine presence of God). This shift occurred along with an activation of senses in ritualistic practice and was necessary in understanding

medieval Christian culture. While stained glass is a medium that is literally defined by the mutability of its material (glass is made from sand, liquidated and hardened by fire), scholars, such as Renee Burnham, Nancy Thompson, and Gerald Guest, have focused primarily on the iconography of glass windows and the workshop practices of glaziers rather than phenomenological meanings. These scholars recognize the visual effect of light moving *through* stained glass, but few connections are made between the shifting physical conditions of the spaces that include glass and the materiality of glass itself. In this paper I will argue that while the sensorial experience of stained glass windows is a significant part of the historical experience of a building it is not the whole story. Using the Church of Orsanmichele in Florence, Italy as a case study, I will suggest that we need to examine the transtemporal contexts for stained glass. By using phenomenology to reconsider glass' purpose over time, we can better understand materiality in its multiple functions. I will pay particular attention to how the addition of stained glass at Orsanmichele marked a shift of the building's meaning from a secular space with limited religious importance to an established church. While the windows were designed to be an important sensorial component of religious practice, the present day experience of these windows is different in great part because of their secularized context as a museum. This research raises questions about the implications of time in viewing art and how our present-day perceptions cannot always reflect the reality of the past.

Political Consciousness of Latinx Migrants in Alamance County*

Lucia Lozano Robledo (Dr. Michael Matthews) Department of History & Geography and International & Global Studies Program

The economic effects of migration has received significant scholarly attention, focusing on a range of issues such as the economic and social benefits of remittances and labor market trends. Few studies have analyzed how the migration experience shapes identity formation, especially regarding political consciousness. This research will focus on the identity development and political consciousness of Latinx migrants in Alamance County. As a growing population in the county, an analysis focused on how their identity and beliefs have changed over time will inform a growing body of literature that examines individual stories of migrant experiences. This study will ask: How has the political consciousness of Latinx migrants in Alamance County shifted over time through the process of migration? To what extent do these migrants consider themselves political actors? Drawing upon eight phone interviews with Latinx migrants in Alamance county, conducted in both English and Spanish, this project examines how their political consciousness and identity formation relates to experiences of migration within a dynamic political landscape. These interviews were thematically analyzed specifically exploring transnational relationships, what is "political" and change-making attitudes and actions utilizing a qualitative research software. Analyzing how the participants' identity and beliefs have changed over time will contribute to a growing body of literature that examines the individual stories of migrants in the context of broader migration patterns. This project is significant as it adds to the existing scholarship on political socialization within migrant families and how this process has the potential to catalyze political activities.

The Victorian Working Class and Art Education: Analyzing the Work of John Ruskin*

Shannon R. Rogers (Dr. Michael Carignan) Department of History & Geography

John Ruskin was a 19th century art critic and scholar, notable for his contributions to the publicization and democratization of museums. Previously, museums acted as social spaces exclusive to the wealthy,

and people were under the belief that poor and uneducated people could not appreciate art in the same way as the elite. However, during the nineteenth century, this belief was overtaken by the growing idea to use art and museums to educate and purify the "dirty and immoral" industrial working class. Ruskin's work about and for the industrial working class helped to form and strengthen this opinion. For this ongoing project, I am conducting a thorough analysis on the writings of Ruskin. I intend to examine how he conceptualized and communicated to the industrial working class as well as educated society, and how his ideas took shape and changed over the course of his writings. For this presentation I will focus on *Fors Clavigera*, a series of pamphlets published monthly from 1871 to 1879. These pamphlets are the focus at this stage in the project, as they emphasize the agency and potential of the industrial working class and provide a look into Ruskin's revisionary mind. Due to the specific audience and motivations of Ruskin, this project focuses on the inclusion of the industrial working class in public spaces that they were not previously welcomed in and shows an early attempt at diversity and inclusion in British society. Through analysis of these writings I hope to answer how Ruskin conceptualized and communicated to the industrial working class, and how he came to believe they were capable of bettering themselves through public education. These findings will influence the continuation of this project, as it develops over the next year, further exploring Ruskin and the museums in the 19th century.

Practices, Beliefs, and Identities: Muslim Immigrants' Acculturation to the United States*

Kylee M. Smith (Dr. Sandy Marshall) Department of History & Geography

This research project focuses on how the everyday experiences of living in the United States impact the religious practices, beliefs, and identities of Muslim immigrants. More specifically, the project seeks to understand how the officially secular and culturally Christian environment of the United States affects Muslim immigrants' religious practices, beliefs, and identities. Situated in the interdisciplinary fields of interreligious studies, migration studies, and human geography, this study offers a diverse understanding of Muslim immigrants' experiences, emphasizing that religious identity is not a barrier to acculturation for Muslim immigrants in the US, but rather the religious identity and acculturation are mutually constitutive. The project utilizes an interreligious and grounded theology framework to analyze the impact that the everyday encounters Muslim immigrants in North Carolina have with non-Muslims and with American society have on shaping their religious beliefs, practices, and identities. Using the concept of grounded theologies, this research attends to the concrete implications for how transcendental religious worldviews are enacted and negotiated in new spatial contexts. To conduct this research, I recorded 19 interviews with sixteen Muslim immigrants and three second-generation Muslim Americans residing in the Triad and Triangle areas of North Carolina and then coded and analyzed the interviews utilizing a grounded theory approach. Most interviewees came from Muslim-majority countries; thus, the experience of being a religious minority in the US affected their acculturation into the US as well as their religious beliefs, practices, and identities. Specifically, the interview data reveal how everyday encounters with non-Muslims in North Carolina prompt Muslim immigrants to evaluate their beliefs critically, determine how to practice Islam most fully, and find their new transnational identity in this world, all while strengthening their personal faith. In this presentation, I focus on how Muslim immigrants' report gaining a more authentic relationship with Allah and deeper connection to Islam and how they personally determine how to continue practicing Islam in America.

Elon History and Memory Report: Exploring the History of Black Students and Anti-Black Racism on Elon University's Campus*

Kayla Spalding (Dr. Charles Irons) Department of History & Geography

This study explores anti-black racism on Elon University's campus from the early 20th century through the first decade of integration in the country, approximately 1923-1972. This research is crucial in understanding and reckoning with Elon's long history of perpetuating white supremacy-- the long-standing belief that white people are intrinsically superior to people from all other ethnic and racial groups--and in lifting up the experiences of black students. As part of a larger project addressing black history at Elon, the student researcher focused on three, discrete issues: the graduation rates of black student-athletes, the prevalence of blackface over time, and attitudes towards the Confederate flag. The university did not keep specific graduation rates by demographic groups until recently. In order to estimate the graduation rate of early black student-athletes, media guides, yearbooks, and commencement lists were compared for the period of 1976 and 1980. The graduation rate of approximately 45% compared favorably to the overall rate for all Elon students during a comparable period (the first official data is from 1982). Official and unofficial student newspapers and the yearbook were the key sources for understanding the extent of the use of blackface and the Confederate flag by faculty and student organizations. While blackface tapered over time, with a heyday in the 1920s, the Confederate flag actually became more prominent, after integration across the country. This meticulous research revealed the various ways anti-black racism on campus persisted throughout the institution's history and negatively affected the lives of black students. The study concludes that acknowledging racist history is necessary for achieving meaningful inclusion and change throughout campus.

Migration, Security, and Climate Change: Analyzing Cape Verde and Morocco's Mobility Partnerships with the European Union

Jane M. Williams (Dr. Sandy Marshall) Department of History & Geography and International & Global Studies Program

The regions of Europe and Africa have experienced migration flows for centuries, yet African migrants attempting to cross into Europe are increasingly perceived by policymakers as a problem requiring systematic management. As a result, over the past few decades, the European Union's (EU) migration policy agenda has become more externalized and securitized, meaning emphasizing the protection of borders and the prevention of non-legal migration. This has shifted where the brunt of migratory pressures are felt, from Europe's immediate borders to buffer states in surrounding regions, such as North Africa. This has also changed the location of migration routes as unauthorized migrants try to avoid border police, particularly those originating in sub-Saharan Africa and traveling through North African countries. Using critical discourse and critical policy analysis methodologies, this research examines two Mobility Partnerships (MPs) that Cape Verde and Morocco have signed with the EU. MPs, the main instruments of EU migration policy, are living documents that set loose, cooperative agreements between the EU and non-EU countries to manage legal migration and combat illegal migration. Specifically, this research addresses the following questions: How are migrants characterized within these Mobility Partnerships? How is the concept of security connected with climate and migration issues within these policies? Preliminary findings indicate the Morocco agreement places more value on the human rights of migrants than the Cape Verde agreement and emphasizes Morocco's heightened status within the European Neighborhood by accounting for both

Moroccan and European priorities. Ensuring the strength of Europe's borders and increasing power beyond immediate European borders have become apparent objectives of European policy agreements, and preliminary results indicate these MPs are no exception. Finally, though scholars have argued that environmental issues should be seen as security issues for several decades, in part by classifying climate change as a matter of security starting in the early 2000s, neither MP mentions climate change or the environment. This indicates a lack of overlap between climate, security, and migration interests in the European-African context.

Human Service Studies

The Chilean Awakening: A Content Analysis of Protest Tweets During the 2019 Chilean Revolution

Daniel T. Bascuñan-Wiley (Dr. Bud Warner) Department of Human Service Studies

In October of 2019, nation-wide protests took Chile by storm following an increase in subway ticket fares in the capital city of Santiago. Smaller protests at subway stations sparked a massive movement of the people in opposition to decades old social policies that they felt them behind. This movement quickly became known as the Chilean Awakening. The current project asks the question: To what extent did the people of Chile and the different, long-standing Chilean social movements articulate into a greater body more adept to challenging the hegemonic, neoliberal government of Sebastian Piñera? To answer this question, a content analysis of 1,350 tweets was performed and emergent themes were analyzed using discourse theory. Discourse theory allows for a multi-level mapping of the complex relationships that developed during the protests and sheds light on the dynamic growth of the movement. Key findings fall into three categories: 1) regressive neoliberalism as the motivation, 2) progressive rebuilding as the goal, and 3) articulation as the method. The awakening of Chileans as *el pueblo* (the people) drove the success of this historic movement. Researching this *despertar* (awakening) offers insights into current radical social movement theory and, importantly, modern Latin American history.

The Food Empowerment Series: Exploring the Efficacy of Empowerment-Based Community Programs

Daniel T. Bascuñan-Wiley (Prof. Monica Burney) Department of Human Service Studies

This project explores the efficacy of the Food Empowerment Series, a collaboratively-created series designed to teach individuals and families in Alamance County skills and ideas regarding healthy food practices. The series is held at the North Park shelter in East Burlington and covers topics in three categories: growing, making, and cooking. Over the course of three sessions, professional instructors teach lessons on canning vegetables at home, breaking down whole chickens, starting a home garden, and more. The series will be advertised to members of the North Park community through snowball sampling, with 10-15 participant spots available on a first come, first served basis. This research project uses the Food Empowerment Series as a case-study to ask two questions: Are participants more able and empowered to engage with locally-sourced, sustainable food? And, are they able to take what they have learned and share it with other community members? Participants will be given exit-surveys that use a combination of Likert scale and open-ended questions regarding their experience at the end of each session. At the end of the series, 30-45 participants will have been surveyed. Results of this

project will provide evidence of the efficacy of empowerment-based models and shed light on participant perceptions of community partnerships.

Resilience Despite Chronic Adversity: How Communities Foster Resilience in Youth*

Rebecca M. Collins (Dr. Vanessa Drew-Branch) Department of Human Service Studies
Communities experiencing chronic adversity due to historical patterns, structural systems, and incidents of social injustice are most often viewed through a deficit lens, being labeled as "at-risk." The use of a deficit lens disregards the strengths and capabilities that communities and individuals possess. The purpose of this research is to observe if and how communities respond to chronically adverse conditions through the transmission of resilience in youth. This study used ethnographic research to observe and document the behavior of youth (defined as ages 8-18) in various community sites in Burlington, North Carolina, and data collected from two community member interviews. The Burlington community was chosen as a case study because it fit the proposed definition of chronic adversity (having more than a 20% poverty rate for children and/or more than 55% of children qualifying for free or reduced lunch). The observations focused on seven individual behaviors within three overarching themes of resilience based on previous literature defining resilience; interpersonal bonding, social connectedness, and personal attitude. The behaviors were as follows: bonding among peers; bonding among youth and older generations; community engagement; being a valued member of the community; positive outward display of emotions; demonstrating initiative; showing respect for the community. Prior to data collection, each of these behaviors was then defined into observable actions. Youth behaviors showed bonding among peers and bonding among youth and older members of the community as the largest portion of observed behaviors, both of which fall under the theme of interpersonal bonding, which was supported by interviews with older members of the community through the mention of these two behaviors as occurrences in the community and of several peer and mentorship groups that exist to foster this within the community. This study concludes that not only do youth experiencing chronic adversity demonstrate behaviors displaying resilience but that communities have developed sites as responses to chronic conditions where this resilience can be transmitted. This is critical in understanding communities experiencing chronic adversity and the agency that individuals in the community have to be resilient and build resilience among members.

Hospital to School: Transitions for Children with Special Healthcare Needs

Margaret F. Davis (Dr. Bud Warner) Department of Human Service Studies

This research evaluates inpatient care educational programs for children with special health care needs, and both hospitals' and schools' capacity to effectively support these students as they transition back into "typical" school settings. This research assesses the current inpatient and outpatient systems' effectiveness in supporting children during their transition. In ineffective cases, the research seeks to understand methods that could improve such programs. Twenty, semi-structured interviews with healthcare professionals, school nurses, teachers, social workers, and therapists were conducted to evaluate the effectiveness. The research highlights the negative impact of low school attendance on medically fragile children. It was found that a common home-hospital liaison or the use of a centralized database could create fluent and effective communication between all parties. Without a cohesive device for communication, the transition for students with healthcare needs becomes fraught and risks significant negative impacts on the child's educational progress. The research provides an opportunity to create positive change in the disability, education, and healthcare communities by emphasizing the individuals' voices who are impacted by these disparate systems.

How Has COVID-19 Affected the Elon Student Experience: A Self-Rated, Comparative Analysis of Student Well-Being Pre- and Post-COVID-19

Kelly J. O'Neil (Prof. Monica Burney) Department of Human Service Studies

This study explores the student life challenges posed on and student satisfaction of Elon University junior and senior students due to the COVID-19 pandemic. The global pandemic caused Elon to follow state regulations and limit gathering large groups of people and switch to remote and hybrid learning options. Social activities on campus have also been greatly limited due to state regulations. Elon has a large greek life, and club sports presence on campus. These, along with study abroad opportunities for students were put on hold due to the pandemic. No known research has examined the student experience impacted by the pandemic. This research aims to hear from students directly about their experiences at Elon pre and post-pandemic. There is a vast amount of research on tips and facts to stay physically safe from the virus. However, there is little research on how the pandemic has impacted students' experience on campus or about how that has affected their overall college experience. For this study students with juniors or senior class, rank will be asked to do a self-report survey to gauge how the pandemic has impacted their life on campus. This survey will ask questions in major categories of the Elon student experience including study abroad, clubs, greek life, and overall sense of belonging on campus. We hypothesize that junior and senior students who were able to experience college prior to COVID-19 will experience decreased satisfaction in these normative college campus experiences due to the state regulations. We will be using a close-ended survey, with Likert rating scales to gauge student satisfaction with their activities pre-and post- COVID-19 campus restrictions. The data will be submitted anonymously and aggregated to determine the collective experience of junior and senior students.

Using the Artistic Process to Identify Resilience in Young Adults During Quarantine

Lauren M. Siedlecki (Dr. Beth Warner) Department of Human Service Studies

The research is an Elon College Fellows project under the Human Services Discipline. Using the strengths perspective in social work and principles of arts-based research as a framework for the research design, the purpose of the study was to find risk factors and protective factors that hinder or aid individuals in overcoming adversity during the pandemic. The risk and resilience model complements strengths perspective, in assessing protective factors in communities at risk of trauma, psychological disorders, and other adversities; risks are defined as the likelihood for an individual, group or community, “to experience a negative outcome,” such as trauma, psychological disorders, and other adversities” (Fraser, 1999, 131). On the other hand, protective factors, “provide resistance to risk by moderating the relationship among risk factors and problems or disorders” (Fraser, 1999, 131-132). Art is used in this research as a tool for self-expression and constructing narratives, which is combined with interviewing to help achieve process-based outcomes. Participants were asked to create three pieces of artwork using the medium of their choice in response to three prompts related to individual, community-based and systemic risk and protective factors. Participants were then interviewed about their creative process and artistic choices made in the artwork in order to illuminate their resilience, unique strengths, self-efficacy and adaptability. Preliminary data suggests that civic participation, relationships with family and friends, and a strong sense of self were protective factors, while mental health and fear about the pandemic and political climate were risk factors for participants. In addition, participants identified that the process itself was therapeutic, enjoyable and was beneficial in terms of meaning-making.

Narrative Experiences of Transmasculine Individuals in American Jails and Prisons*

Jay D. Tiemann (Dr. Vanessa Drew-Branch) Department of Human Service Studies

Existing literature documents the all-too-common abuse of Black trans women that occurs at the hands of police and inside jails (James et al., 2016), but the literature on the experiences of trans men is virtually nonexistent. Transphobia makes it dangerous for many trans men, especially Black trans men, to be open about their trans status, and many choose to not disclose it. One could imagine that the stakes for being outed in prison would have even higher stakes, but there are not consistent policies on how to determine the safest facilities for housing trans inmates. The researchers sought to learn how housing placements are made, whether the men had any say over their placements, and the potential risk and/or protective factors of the different facilities. It was expected that trans men who passed as cis men would be at a higher risk for emotional harassment if housed with women and would be at a higher risk for physical or sexual assault if housed with cis men. Solitary housing may not be a safe alternative--Previous studies have documented the emotional trauma brought on by solitary confinement, even when used for "protective" reasons (Haney, 2018). To recruit participants for this study, Trans(forming), an Atlanta nonprofit organization that is run by and for formerly incarcerated transmasculine people of color, agreed to partner with the student. Six semi-structured interviews were conducted with formerly incarcerated transmasculine individuals. All participants happened to be Black and identify as trans men. The interviews were coded for themes which showed that the participants who had been in prisons had very different experiences than the participants who had been held in state or county jails. The participants who had been in jail had more negative experiences, felt more unsafe, and experienced more transphobia from guards and other staff. These results suggest the need for the development of trans-informed policies for state and local jails and accountability measures for staff. Future research could expand the scope of this project and investigate the common theme of increased police profiling/harassment after passing as a Black man, a theme all participants reported.

Incentives That Motivate Parents to Complete Parenting Classes*

Mariel Tivoli (Dr. Judy Esposito) Department of Human Service Studies

Parenting classes initially started as a support group for parents to discuss and solve child rearing issues (Croake, & Glover, 1977). Today, parenting classes are used all over the world as a means to help parents engage with their children, correcting negative behavior, and promoting positive coping mechanisms and lifestyles (Axford, et al., 2012; Bahadourian, & Greer, 2005; Mason et al., 2016). However, parents of lower socioeconomic status, primarily parents of color, often have less access to parenting programs due to geographical and financial barriers, as well as their ignorance about the programs and benefits offered (Clark, & Baker, 1983; Duman, et. al., 2010; Heidari, et al., 2018). This means that the parents who cannot attend the parenting classes are often the ones who may benefit from them the most (Vazquez & Villodas, 2018; Murphy & Bryant, 2002). As such, school staff and community organizers are pressed to find incentives and motivators to encourage and increase parent participation especially through the promotion of accessibility. Research on incentives motivating participation and program completion in general have primarily looked at areas such as weight loss and healthier living (Dailey, et al., 2018; Deering, et al., 2009; Tonigan & Rice, 2013). However, little to no research has examined motivations for parents to complete parenting classes. The purpose of this meta-analysis to investigate motivating factors to complete parenting classes. Initial findings show that peer accountability, money, and accessibility to the programs are large incentives toward parental

completion of said classes. Racial and socioeconomic disparities also play a large role in the motivations toward parents completing parenting classes (Clark & Baker, 1983; Duman et. al., 2010; Heidari, et al., 2018). The criteria for this meta-analysis were the motivations and incentives behind completion of programs and looking at parenting classes completion statistics and the reasons behind participation and follow-through.

International and Global Studies

Oh Mother, Who Art in Hell: Examining Internal and External Conflicts of Immigrant Women Through the Work of Carmen Jiménez
(This project will be presented in Spanish.)

Jo A. Fradkin (Dr. Mayte De Lama) Department of World Languages & Cultures and International & Global Studies Program

The dictatorship of Francisco Franco lasted in Spain from 1939-1975, and is often characterized by violence, fear and oppression. It was also during this time that Franco's ideology confined women to a single standard: weak and submissive. However, after the death of Franco in 1975 and the subsequent transition in Spain from dictatorship to democracy, the country saw a boom in literature written by women, and a clear change among themes being written about. With the freedom to write without censorship, female authors began taking risks and were empowered to write about topics once considered inappropriate. It is clear that the insurrection of female authors was not only necessary, but inevitable. It is then evermore important to highlight female authors who emerged after the Franco era, and use their writing to better understand and expose societal struggles and change. The present research is a case study of Carmen Jiménez' 2008 award winning novel, *Madre mía, que estás en los infiernos.* Through this novel, readers not only develop a deeper understanding of female writing and feminism, but also are exposed to a complex look at immigration within the Spanish-speaking world. In her effort to change the way women are represented in Spanish literature and foster self-acceptance, Jiménez also examines domestic violence, machismo, and immigration as a form of escape. The aim of the present research is to contextualize the unique contributions of Jiménez through an analysis of the struggles her protagonist faces, realizing they directly contrast with previous perspectives on women and motherhood. Ultimately, the research concludes that Jiménez carefully debunked the narrative that the only reason women immigrate is economic instability. Through an analysis of Jiménez' writing, it is clear that she serves as an example of modern women who write about controversial feminist topics in the post-Franco era, ultimately leading to a deeper understanding of realistic challenges women face.

Female Narratives in Forced Migration: Syrian Refugees in Turkey*

Sydney R. Hallisey (Dr. Damion Blake) Department of Political Science & Policy Studies and International & Global Studies Program

Since 2011, 6.2 million refugees have been displaced from Syria into surrounding communities and beyond. The largest refugee communities are found in Jordan, Lebanon, and Turkey, and these groups have been studied extensively since the civil war began. Going beyond existing quantitative research on survival, violence, and assault, this study aims to provide qualitative depth and texture to the experiences of refugee women navigating new environments. The investigation explores the narratives of refugees who have been displaced from Syria to Istanbul, Turkey as a result of the Syrian civil war. With a convenience-based snowball sample which utilized the resources of a refugee community

center, 22 women and 3 men were interviewed about their experiences with integration into the Turkish state and society. The social, political, and medical adversity and challenges that accompany integration for Syrian women in Turkey include language barriers, discrimination, and a clash of identity and values. The findings of the study describe the narratives of female refugees in how their roles and identities have changed as a result of forced migration, and how these identity changes, particularly as they relate to gender roles and responsibilities, are impacting their families. Many of the participants reflected positively on these identity shifts, expressing hope for the future of their daughters and the future of Syria.

Making and Unmaking Memory: University Student Protest in Pinochet's Chile

India L. Kirssin (Dr. Michael Matthews) Department of History & Geography and International & Global Studies Program

This project examines how university students and the military junta created conflicting narratives and memories from 1983 to 1986 about the Chilean dictatorship of Augusto Pinochet (1973-1990). It specifically seeks to answer the following questions: how did Chilean university students utilize protest to contest the discourse and narrative formed by the Chilean military junta? How did this protest spur greater society into creating an opposing narrative that shaped the collective memory of Chileans? It analyzes the organizational structures and events used by student leaders and participants to argue that they built a successful movement against the military junta central to the larger national movement that peacefully voted Pinochet out of power in 1989. This study explores how students contested the junta's official narrative and shaped Chileans' collective memory and national identity by examining newspaper articles from the *Fortín Mapocho* (1983-86), internal University of Chile student federation (FECH) memos, and university student interviews. It also utilizes current literature about memory, narrative, and the actors in the fight to re-democratize Chile such as Steve J. Stern's *Battling for the Hearts and Minds: Memory Struggles in Pinochet's Chile, 1973-1988.* It offers insights into the organization of student protest in an authoritarian context and the role of competing narratives in forming social memory. In so doing, it contends that through the development of student organizations and protests, university students successfully employed oppositional language to create a collective memory that contested the regime's official narrative.

"Power for the People" or an "Eternal Quest for Power?": Race, Class and Democracy in Hugo Chávez's Venezuela*

Molly L. Logan (Dr. Michael Matthews) Department of History & Geography and International & Global Studies Program

The presidency of Hugo Chávez (1999-2013) marked a controversial shift in Venezuelan politics. While Venezuela had been regarded as a thriving democracy for the majority of the twentieth century, Chávez's administration challenged traditional notions of liberal democracy, in particular questioning democracy's relationship to race and class. In January of 2005, Chávez announced his vision of "socialism for the twenty-first century," which he also labeled the Bolivarian Revolution. Chávez proposed that this modern socialism would be unlike Soviet communism due to its democratic incorporation of all Venezuelans, whether wealthy, poor, white, *mestizo*, or black. This project poses the central question: How did Venezuelan perceptions of race, and relatedly class, shape definitions of democracy under Hugo Chávez? Analyzing Chávez's speeches, human rights reports, nongovernmental organization (NGO) data, and government and opposition media, this research

uncovers two conflicting narratives. The first assumes a traditional, Western definition of democracy, in which the absolute freedom of the individual and the market is emphasized. Citing his attacks on the media, nationalization of industry, and attempts to suppress political opponents while expanding his own power, critics denounced the president's commitment to democracy (Marcano and Barrera 2007, Canache 2002). The second narrative suggests an alternative conceptualization of a more social democracy, in which racial and economic equity are foundational. Supporters praised Chávez for stimulating a national discourse on social inequality, and particularly for engaging a discussion on Venezuela's complex, yet largely-avoided racial history (Jones 2008, Bruce 2008). He further implemented national social programs that sought to alleviate the consequences of economic and racial marginalization. This project argues that Chávez's Bolivarian Revolution succeeded in incorporating the masses and empowering the historically disenfranchised, making democracy accessible to those who had been excluded for years. While the shortcomings of Chávez's vision are evident in the modern day, the reconceptualization of social democracy reflected in his administration necessitates an ongoing analysis of the interconnections between race, class, and political participation.

Political Consciousness of Latinx Migrants in Alamance County*

Lucia Lozano Robledo (Dr. Michael Matthews) Department of History & Geography and International & Global Studies Program

The economic effects of migration has received significant scholarly attention, focusing on a range of issues such as the economic and social benefits of remittances and labor market trends. Few studies have analyzed how the migration experience shapes identity formation, especially regarding political consciousness. This research will focus on the identity development and political consciousness of Latinx migrants in Alamance County. As a growing population in the county, an analysis focused on how their identity and beliefs have changed over time will inform a growing body of literature that examines individual stories of migrant experiences. This study will ask: How has the political consciousness of Latinx migrants in Alamance County shifted over time through the process of migration? To what extent do these migrants consider themselves political actors? Drawing upon eight phone interviews with Latinx migrants in Alamance county, conducted in both English and Spanish, this project examines how their political consciousness and identity formation relates to experiences of migration within a dynamic political landscape. These interviews were thematically analyzed specifically exploring transnational relationships, what is "political" and change-making attitudes and actions utilizing a qualitative research software. Analyzing how the participants' identity and beliefs have changed over time will contribute to a growing body of literature that examines the individual stories of migrants in the context of broader migration patterns. This project is significant as it adds to the existing scholarship on political socialization within migrant families and how this process has the potential to catalyze political activities.

Traumatic Memory in Marie-Célie Agnant's Femmes aux temps des carnassiers and Le Livre d'Emma*
(This project will be presented in French.)

Lucia Lozano Robledo (Dr. Sarah Glasco) Department of World Languages & Cultures and International & Global Studies Program

My research is seeking to answer the question: How does Marie-Célie Agnant represent the effects of traumatic memory through her characters' development in her novels Femmes aux temps des

carnassiers and Le Livre d'Emma? Femmes aux temps des carnassiers considers the intergenerational psychological impacts of decades-long terror in the context of the Duvalier dictatorships in Haiti. Similarly, in Le Livre d'Emma traumatic memory plays a critical role in the development of Emma's character as Flore, her interpreter at the psychiatric hospital, seeks to piece together Emma's life story. Several implications related to mental health and how memory is constructed and embedded in historical recollection at governmental, familial, and individual levels are raised in this analysis. Through an in-depth literary analysis of both novels and supplementary secondary scholarly articles on traumatic memory, this research will assess how Agnant uses language to communicate how her characters process trauma as well as how interpersonal dynamics are shaped by these experiences in the novels. Considering the holistic impact of trauma in addition to outside factors, this research hopes to illuminate how Agnant's characters survive and navigate traumatic memories of the past, and how those can be integrated into and haunt the present. Although this research is still in progress and there is much to be discovered, I expect to contribute to the studies of francophone literature that explore the role of traumatic memory in the lived experiences of members of the Haitian diaspora. This research presentation will be in French.

Investigating the Asian Infrastructure Investment Bank's "Best Practices" Commitment in Project Transparency and Accountability

Lily J. Sandifer-Stech (Dr. Jason Kirk) Department of Political Science & Policy Studies and International & Global Studies Program

The Asian Infrastructure Investment Bank (AIIB), a Chinese-led multilateral development bank, opened in 2016. The AIIB claims to uphold global best practices in mitigating environmental and social impacts of its projects, and in its own transparency and accountability, and hence has established its Environmental and Social Policy and Project-affected People's Mechanism. The limited literature on the AIIB mainly addresses its financial impact in Asia and beyond, its soft power potential for China, and its governance structure. While there is a specialist literature on transparency and accountability for the World Bank and established regional development banks, similar literature analyzing AIIB operations is only beginning to emerge, and this study fills this gap in the scholarship on the political economy of multilateral development banks. It provides a comparative case-study analysis of three AIIB projects in India: one co-financed with the World Bank (Amaravati Sustainable Capital City Development Project), one previously funded by the World Bank but later taken up independently by the AIIB (Mumbai Urban Transport Project), and one AIIB standalone project (Andhra Pradesh Urban Water Supply and Septage Management Improvement Project). All three projects are categorized as environmentally and socially high impact, particularly in their land acquisition and resettlement components. The first two were both subject to complaints to the World Bank Inspectional Panel. The study seeks to understand the AIIB's actions and to investigate its claim of upholding established best practices in social and environmental impact mitigation. As the AIIB is led by nondemocratic China, this study also aims to understand whether the AIIB is susceptible to the kinds of civil society pressures experienced by the American-led World Bank in the case of India, itself a democracy with strong activist traditions. Qualitative data will be collected through process tracing in the form of project staff interviews, media sources, external reports, official documents of the AIIB and World Bank, and government documents on the selected project. Preliminary results indicate that AIIB so far has largely followed the World Bank's lead in transparency and accountability, but questions remain about its independent capacities as it shifts from primarily co-financed to standalone projects.

"A Black Daughter of the South": An Analysis of Local and National Coverage of Stacey Abrams' Gubernatorial Campaign*

Pearl E. Sullivan (Dr. Laura Roselle) Department of Political Science & Policy Studies and International & Global Studies Program

In 2018, Stacey Abrams, the Minority Leader in the Georgia State House of Representatives, campaigned to be the governor of Georgia. The campaign garnered national attention as Abrams, the first Black woman to be a major party's nominee for governor in the country, excited Democratic hopes of turning Georgia blue (Bacon 2018). Between the start of 2017 and the beginning of 2019, the Atlanta Journal Constitution published 611 articles that mentioned Abrams, and the New York Times published 285 stories related to her candidacy. This paper explores the differences in the local and national portrayal of Abrams' campaign and how the coverage reflected media trends in the presentation of women of color, specifically female candidates of color. The research finds that the national coverage of Abrams both mentioned and focused on Abrams' identity as a Black woman to a greater extent than the local coverage. Additionally, the paper shows that neither local nor national outlets used stereotypical framing common in the coverage of women of color in politics in their coverage of Abrams' campaign.

A Seat at the Table or a Power Seat: The Impact of Simple Representation Versus Power Representation of Women in Government on Funding for Primary Education

Pearl E. Sullivan (Dr. Casey DiRienzo) Department of Economics and International & Global Studies Program

A large body of research shows that female politicians focus more on common good issues, such as health care and education, than their male counterparts Even if women are present in the government, these issues may not be raised when men hold the majority of positions of political power. In this research, I use a cross-country panel dataset to examine the impact of women in government on public spending on primary education, an important public good. Specifically, I explore whether it is enough for women to be represented in government, or if they must have a position of power to affect policy outcomes. The research fills multiple gaps in the literature as previous research is inconclusive on the impact of women's representation on funding for education and practically nonexistent regarding the impact of women's power representation on education spending. The analysis' results indicate that both women's simple representation and power representation are significantly positively correlated with increases in federal spending on primary education; however, when women hold positions of political power there is a greater impact on funding than when they simply hold a seat in the legislature.

The Social Impact of Gacaca Courts in the Reconciliation Process in Rwanda*

Mary C. Thibodeau (Dr. Mussa Idris) Department of Sociology and Anthropology and International & Global Studies Program

Restorative justice is often misunderstood by Western academia in the context of community-based justice systems in postcolonial African nations. The Gacaca courts used in Rwanda after the 1994 genocide against the Tutsi are frequently criticized for their procedures and outcomes. However, a majority of these criticisms come from Western authors who have failed to engage in conversations with Rwandans and observe the effects of the trials. The only people who know and understand the impact of the Gacaca courts are Rwandans. This research project focuses on how the Gacaca trials

have contributed to homegrown solutions. It demonstrates the impacts of the trials within Rwandan communities in the ways they brought about reconciliation. In addition to completing a review of the literature on the Gacaca process, I conducted 20 semi-structured interviews with survivors and perpetrators of the genocide who participated in the Gacaca's to assess the impact of the judicial process within their communities. These interviews were conducted throughout November and December of 2020. The Gacaca courts were able to work through just under 2 million cases between 2005 and 2012, dispensing community justice and punishments to the perpetrators through methods of forgiveness and openness, which in turn crucially aided the nation in moving forward. The accounts from participants of the Gacaca courts indicate that the courts in the view of Rwandans and Rwandan professors were highly successful in producing fair verdicts and communal justice in the Rwandan context. While there were challenges, the successes outweigh these issues. The process succeeded in giving perpetrators justice for their crimes and truth to the survivors and community. The research shows how the Gacaca courts allowed for a time of listening, forgiving, and healing amongst communities, fostering communal growth of education programs, health care systems, security, and the overall development of the nation. Each interviewee conveyed their support for the Gacaca courts and expressed their belief in a Rwandan solution for a Rwandan issue.

Migration, Security, and Climate Change: Analyzing Cape Verde and Morocco's Mobility Partnerships with the European Union

Jane M. Williams (Dr. Sandy Marshall) Department of History & Geography and International & Global Studies Program

The regions of Europe and Africa have experienced migration flows for centuries, yet African migrants attempting to cross into Europe are increasingly perceived by policymakers as a problem requiring systematic management. As a result, over the past few decades, the European Union's (EU) migration policy agenda has become more externalized and securitized, meaning emphasizing the protection of borders and the prevention of non-legal migration. This has shifted where the brunt of migratory pressures are felt, from Europe's immediate borders to buffer states in surrounding regions, such as North Africa. This has also changed the location of migration routes as unauthorized migrants try to avoid border police, particularly those originating in sub-Saharan Africa and traveling through North African countries. Using critical discourse and critical policy analysis methodologies, this research examines two Mobility Partnerships (MPs) that Cape Verde and Morocco have signed with the EU. MPs, the main instruments of EU migration policy, are living documents that set loose, cooperative agreements between the EU and non-EU countries to manage legal migration and combat illegal migration. Specifically, this research addresses the following questions: How are migrants characterized within these Mobility Partnerships? How is the concept of security connected with climate and migration issues within these policies? Preliminary findings indicate the Morocco agreement places more value on the human rights of migrants than the Cape Verde agreement and emphasizes Morocco's heightened status within the European Neighborhood by accounting for both Moroccan and European priorities. Ensuring the strength of Europe's borders and increasing power beyond immediate European borders have become apparent objectives of European policy agreements, and preliminary results indicate these MPs are no exception. Finally, though scholars have argued that environmental issues should be seen as security issues for several decades, in part by classifying climate change as a matter of security starting in the early 2000s, neither MP mentions climate change or the environment. This indicates a lack of overlap between climate, security, and migration interests in the European-African context.

Journalism

Exploring Ecofeminism: A Study Through Content Analysis and Multimedia Reporting

Payton Byrnes (Dr. Alex Luchsinger) Department of Journalism

Ecofeminism, a movement born of the peace, environmental, and equality movements, asserts a connection between the systemic oppression of women and the destruction of the environment. Drawing on these ideas, this exploratory study examines the framing of female-identifying environmental activists in US print news media. The rationale for studying the framing of the movement comes from previous scholarship on how framing impacts public perception of social movements and overall movement success. The discipline of communications contains a variety of research studies analyzing the framing of the feminist movement and the ecology movement separately, but not much work has been done on the convergence of the two. In order to fill this gap, articles were selected that specifically included both women and the environment. News articles were selected from five top US publications: *The New York Times*, *The Washington Post*, *The LA Times*, *USA Today*, and *The Wall Street Journal*. These articles were coded for frames that were derived from scholarship and critique of ecofeminist theory. While each frame appeared at least once in one of the articles, economic frames and strength/agency of the activist were the most common. The findings of this study will be applied to the creation of an original multimedia piece featuring the story of an ecofeminist activist.

Journalists' Dilemma: Human Rights Coverage in the 1978 World Cup

Amanda L. Gibson (Dr. Glenn Scott) Department of Journalism

A large body of literature shows the manner in which mega-events, such as the Olympic Games and The World Cup, are often covered by journalists without challenge (Roche, 2003; Rivenburgh, 2004). This study expands on that literature by investigating the manner in which journalists approached covering the crossroads of human rights conflicts and sport by finding if the conflict or sport itself was prioritized in coverage during the 1978 World Cup in Argentina. During the time of the World Cup, Argentina was run by a military regime seeking to provide stability in a country torn apart by subversive violence and military response (Archetti, 2006). Foreign journalists were thrust into the center of the conflict once they arrived to cover the tournament but found themselves facing issues much larger than soccer. covering the tournament. This study sought to find if journalists prioritized sport or human rights in their coverage. Using a qualitative comparative content analysis, the study examined news coverage in three newspapers: The Buenos Aires Herald, The Miami Herald, and The Times of London. These papers come from countries or demographics with strong interest and ties both economically, culturally, and politically to Argentina and Latin America (Huggins, 1987; Schmidli, 2011; Rein & Davidi, 2009). The study found that, ultimately, journalists did cover the political unrest in Argentina, but once the matches started coverage focused on the outcome of the matches. Frames applied by journalists within the coverage showed a range of methods of presenting the issues in relation to international reactions, subversion, and regime stability.

Management & Entrepreneurship

Why Does Cyberloafing Help You and Hurt Me? An Investigation into the Role of Personality on Cyberloafing and Stress

Sophie T. Blumenfeld (Dr. Brittany K. Mercado) Department of Management & Entrepreneurship

Cyberloafing occurs when employees use technology for nonwork activities instead of work (Pindek et al., 2018). Traditionally viewed as time wasted, recent studies show that cyberloafing can help employees cope with stress at work (e.g., Andel et al., 2019). In this study, we seek to investigate how personality—specifically locus of control—influences potential benefits employees may experience from cyberloafing. Conservation of resources theory states that individuals are motivated to gain and invest resources to enrich their overall resource pool (Hobfoll, 1989). Whereas stress serves as a key threat to resources, personality can serve as a particularly valuable resource. Certain personality traits may predispose individuals to act in ways that better conserve their resource pool, while others may predispose them to less effective behaviors. Individuals with an internal locus of control (internals) believe that they determine their own fate in protecting their resources (Galvin et al., 2018). Therefore, internals are more likely to engage in problem-based coping, which directly addresses and attempts to reduce stressors. In contrast, externals more often utilize less effective emotion-based coping (Blanchard-Fields & Irion, 1988), as they feel their fate is out of their control. Given this tendency, we propose that internals are more likely to cyberloaf proactively in ways that help them address their stressors, preserve their resources, and reduce stress. In contrast, externals typically escape from stressors; this less intentional, reactive coping is likely to be less effective in preserving resources. To investigate this phenomenon, we are conducting an anonymous online survey of a sample of 160+ U.S. adults employed at least half-time (20+ hours/week) with access to technology at work. We will clean these data and analyze these relationships via multiple regression. The results will advance the debate on the benefits and harms of cyberloafing by demonstrating why these behaviors may positively influence some employees while not benefiting others.

Exploring the Relationship between Corporate Social Responsibility and Financial Performance in the Oil & Gas Industry

Jannik Elmer (Dr. Scott Hayward) Department of Management & Entrepreneurship

How do Corporate Social Responsibility (CSR) efforts affect companies' financial performance? Even with the importance of CSR in business on the rise, this question largely remains unanswered. In particular, the scientific community has not reached a consensus yet whether it pays to invest in responsible business practices. Meeting this challenge, this paper examines the relationship between Corporate Social Performance (CSP) and Corporate Financial Performance (CFP) in the global Oil & Gas industry. Financial performance is measured using accounting-based (Return on Assets and Return on Capital) and market-based (Stock Returns) performance indicators. The CSR performance of companies is captured by Bloomberg's proprietary ESG scores released in 2020, including Environmental and Social scores for 252 companies in the Oil & Gas sector. A fixed-effects panel regression model is used to examine linear and non-linear relationships. We find a significant positive relationship between Environmental and Social Performance with the accounting-based measures of CFP. The non-linear models provide evidence that investments in social performance make sense to a certain threshold; above this threshold, resources should instead be allocated to environmental performance. These findings add to the research that argues for a positive correlation between

corporate social and financial performance by providing empirical evidence that suggests a virtuous circle where increased profits in turn lead to increased CSR spending.

Examining Small Business Use of Cross-Promotion of Social Media Across Communities in Alamance County

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How do small businesses cross-promote their products on social media? What effect does this have on their customer engagement? Faced with limited resources, small businesses often turn to Facebook as a key tool for social media marketing. Here, cross-promotion - as a marketing strategy that businesses implement to gain benefits from the use of another business' brand, product, or service – could prove to be a particularly advantageous way to increase customer engagement and acquisition. Based on patterns seen thus far in the research, we hypothesize that small businesses' use of cross-promotion on Facebook will increase customer interaction, engagement, and brand recognition for these businesses. Using a platform called CrowdTangle, we are gathering and analyzing data from three entrepreneurial communities in Alamance County (Burlington, Saxapahaw, and Graham) to better understand cross-promotional strategies on Facebook between businesses within these communities. Our dataset contains information from 239 organizations and 7,316 posts that were posted between June 1 to September 1, 2019. During our first phase of data collection and analysis, we identified which posts utilized cross-promotion. We are currently categorizing and analyzing specific cross-promotional strategies. Data analysis is completed by a larger team, but each student author is responsible for a different community as well as a relevant literature stream. Ben House is working with Graham data and exploring literature on economic ecosystems. Nia Griffin is working with Saxapahaw data and exploring literature on customer engagement. Grace Granger is working with Burlington data and exploring literature on social media marketing strategies. We expect to find differences in data patterns across communities and anticipate more cross-promotion utilization in smaller communities such as Saxapahaw.

An Investigation into the Role of Age and Performance on Perceptions of Pay Disparity

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Societal income inequality has received substantial attention from researchers as inequality levels are rising globally with demonstrated negative impacts (Buttrick & Oishi, 2017; Wilkinson & Pickett, 2009). However, this study sheds light on a more personal experience of inequality: employees' tolerance of pay inequality in the workplace. Here, we examine inequality as the pay ranges of employees within the same level of an organization, called horizontal pay dispersions (Shaw, Gupta, & Delery, 2002). Prior research shows horizontal pay dispersions influence individual and organizational performance both positively and negatively (Bloom, 1999; Kepes, Delery, & Gupta, 2009). Although some studies have found age to influence the tolerance of societal income inequality (Gonthier, 2017; Larsen, 2016), we know little about how employees of different ages might react to these disparities. As the economy undergoes a major generational shift with employees encompassing increasingly diverse opinions, mindsets, and perceptions toward work in general and pay structures in particular (Benson & Brown, 2011; Cates & Jackson, 2020; Gonthier, 2017), the need to understand the effects of age on workplace perceptions is high. Recognizing that productive workers tend to prefer performance-based payment schemes, thereby implicitly accepting higher income dispersion (Dohmen

& Falk, 2011; Lazear, 2000), this study investigates the extent to which age moderates the relationship between tolerance of pay dispersion and job performance. To address this research question, we are conducting an anonymous, online survey of employees ranging in age and occupational contexts. We will analyze their tolerance of pay dispersion, performance, and demographic variables via regression. This presentation will discuss the results and implications of our findings. We hope to help human resource management professionals and organizations develop fairer salary structures and better work environments to create more productive workforces.

Marketing & International Business

Moderating Role of Corporate Social Responsibility and Team Net Worth on Consumer Authenticity Perceptions for Professional Sport Leagues in North America

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This research investigates the importance of corporate social responsibility (CSR) performed by sport leagues, the impact of corporate competence and resource availability, and how they interact to shape consumer perceptions of authenticity. By knowing which CSR efforts (community outreach, environmentalism, and diversity) are seen as authentic by consumers, teams and leagues can strategically implement and promote the efforts that are more harmonious to their mission and vision. To observe consumer perceptions of authenticity for NBA and NFL teams, three empirical studies will be conducted. All surveys will be created using Qualtrics and published on Amazon Mechanical Turk. Data to be collected measures authenticity, reliability, credibility, and attitude of respondents toward the type of CSR effort made by teams with the highest and lowest estimated net worth in their leagues. For the NBA the teams with the highest and lowest net worth are the New York Knicks and the Memphis Grizzlies, respectively. In the NFL, the team with the highest net worth is the Dallas Cowboys and lowest is the Cincinnati Bengals. Past studies show that differences in corporate competence have an impact on the perceived authenticity of CSR activations, it is the framework established in these studies that has been adapted to focus on sport organizations, define corporate competence using team net worth, and test the authenticity of CSR foci rather than CSR activations. Based on the literature, it is hypothesized that the NFL's CSR efforts will be seen as less authentic than the NBA's efforts; low net worth teams engaging in environmental CSR will be perceived more authentically than high net worth teams; high net worth teams engaging in community outreach will be perceived more authentically than low net worth teams; and perception of diversity efforts will not differ based on net worth. By upholding the core values of their organizations and highlighting CSR efforts related to these values, companies can improve their perception among consumers. Bringing this knowledge to the sport industry can reveal key differences on methods of CSR advertising between leagues, team net worth, and how it impacts consumer perception to inform marketing and communications professionals.

Leadership and Corporate Social Responsibility: The Role of Spiritual Intelligence

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Corporate Social Responsibility (CSR) has become an increasingly integral aspect of the modern business world. Companies that practice CSR focus on more than just their profits, they aim to better the planet, their communities, and society as a whole through activities such as making charitable donations, volunteering, and exercising ethical practices (Costa & Menichini, 2013). Leadership, a

critical determinant of a firm's success, is linked to CSR since many leadership roles now include responsibilities to advance CSR within firms. This study focuses on leadership communication specifically because many scholars agree communication is integral to effective leadership (Mayfield & Mayfield, 2017; Zulch, 2014). Firms recognize the importance of leadership development and, in recent years, a strong emphasis has been placed on developing individuals' emotional intelligence (EQ). EQ helps individuals become more empathetic and effective leaders, and while EQ should continue being prioritized, there is another highly valuable intelligence that some leaders may possess, spiritual intelligence (SQ). This is the ability to recognize and live with a purpose larger than oneself (Zappalá & Scott, 2013). This type of intelligence goes beyond IQ and EQ and may be another invaluable skill to possess in the work world. Thus, this project explores the relationship between leadership communication and firm CSR in addition to the role of EQ and SQ as moderators of that relationship. Project methodology includes data collection through a survey administered by Qualtrics to 210 employees of large corporations (more than 500 employees) in the United States and the United Kingdom. The survey's composition includes demographic questions and pre-existing Likert scales on leadership communication, CSR, emotional intelligence, and spiritual intelligence. The data set was tested and analyzed using a stepwise model in IBM SPSS Statistics Version 26. This study's results show that the relationship between leadership communication and CSR is highly significant while EQ's moderation of the relationship is insignificant. SQ's moderation, however, is significant and strengthens the relationship between leadership communication and CSR. Thus, this study suggests that large corporations can leverage leaders with high spiritual intelligence and/or provide spiritual intelligence training for employees to enhance CSR within their firms.

The Effect of Stories Told by Celebrity versus Regular Person Endorsers on Consumer Perception of Luxury Goods

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How luxury brands present and deliver their product stories has a direct impact on the consumer. Stories personalize appeals to the consumer and, therefore, offer an effective way to showcase a brand and the associated product. Thereby, they influence their perception since consumers perceive stories as more compelling than the mere presentation of facts - they are better suited to understanding stories than arguments. This research investigates storytelling endorsements for luxury goods to develop a more nuanced understanding of luxury consumers' effects. Specifically, this research tests how celebrity and regular person endorsers affect how the consumer perceives the brand associated with them, and perceptions of the advertisements themselves. This study extends prior research to the perception of luxury. Experimentally manipulating the story at two levels (celebrity, regular person), a student sample evaluated Moët & Chandon champagne on a series of product benefits attributes and the advertisement itself on a series of story attributes. Means of analysis included a series of t-tests. In support of the proposition, respondents exposed to the celebrity endorsements of luxury goods rated both the brand and advertisement more highly on most all attributes than for regular person endorsements of luxury goods. Theoretical and managerial implications are discussed.

Mathematics & Statistics

A Singular Value Decomposition Spellchecker

Gabriel Ackall, Richard Yuan, & James Sprow (Dr. Crista Arangala) Department of Mathematics & Statistics

This research project applied Singular Value Decomposition (SVD) clustering as a tool for spellchecking. A repository of the 10,000 most common English words as determined by n-gram frequency analyses of Google's Trillion Word Corpus were used as a dictionary for spellchecking. We created an array for each word where each character in the word corresponded to a value between 1 and 26 depending on its location on a standard keyboard. The length of each array was the number of characters in the word the array was made from. For each misspelled word, we performed SVD clustering on the words from the database plus the misspelled word to generate a 2-dimensional value for each word. The Euclidean distance between the misspelled word and words in the database could then be found, and the closest word would be used to replace the misspelled word. These methods yielded an accuracy of 21.0% for the top 1000 most misspelled words. However, this accuracy increased dramatically to 63.4% for misspellings of the top 1000 used words where adjacent characters were switched with each other or a character was randomly replaced. The flexibility and low computational cost of the methods in this research illustrate the potential for clustering techniques in natural language processing. Further exploration of SVD assignment values, based on multiple dimensions and other distance measures, may greatly improve accuracy.

Tamely Ramified Invariants for p-adic Polynomials of Degree 2p

Henry R. Chance (Dr. Chad Awtrey) Department of Mathematics & Statistics

For a prime number p, the p-adic numbers are an important object of study in mathematics, computer science, and theoretical physics. Their unique symmetry properties also make them amenable to classification. Specifically, we are interested in the finite number of symmetries of the roots of a polynomial which make them readily classifiable into groups for each degree. In fact, it was shown in the 1960s by M. Krasner that there are only finitely many distinct extension fields defined polynomials of a given degree whose coefficients are p-adic numbers. Since that time, many researchers have worked to develop theory and computational methods to classify these distinct polynomials. So far, all polynomials have been classified when the degree is a prime p or less than 15. In this project, we consider the case in which the degree is equal to two times a prime number p. In particular, we classify the tamely ramified invariants for polynomials of degree 2p. This work is important for computing the symmetry properties of such polynomials, which have applications to quantum mechanics and dynamical systems.

Investigating Technology Use in Secondary Mathematics Virtual Classrooms

Kasey Collins (Dr. Aaron Trocki) Department of Mathematics & Statistics

Although research in mathematics education has documented how technology can be utilized in mathematics teaching and learning, there is limited research on teaching practices with technology in the virtual classroom and the alignment between teachers' beliefs and these practices. This preliminary study is an investigation of the teaching practices of high school math teachers and their beliefs about

teaching with technology in the virtual classroom. Five teachers completed a questionnaire and an interview regarding their teaching practices and beliefs about technology use in the classroom. Two of the five participants were then observed numerous times by the researcher in the virtual classroom held over Zoom. In order to document how the teachers' beliefs may align with their practices, field notes were taken to assess how the teacher engaged students in mathematics with the technology. This includes but is not limited to how technology is used for collaboration: student to student; student to teacher; or individually by the teacher. Technologies used for the teaching of mathematics (aside from Zoom) were then categorized based on orchestrations (Drijevers et al., 2010) and the replace/amplify/transform framework (Hughes, Thomas, & Scharber, 2006). Results of the study are currently being organized and summarized. These results may assist educators seeking to enhance the teaching of mathematics with technology in both in-person and virtual classrooms.

Solutions to Multicolor Lights Out

Luciana Ferman (Dr. Crista Arangala) Department of Mathematics & Statistics

The traditional Lights Out game consists of a 5x5 grid of lights. The game starts with an initial state where some lights are on and some lights off, and challenges the user to turn the Lights Out with a sequence of pushes. The Lights Out board offers the user only on and off lights (the 2 states). When a button is pushed it changes its state and the states of all of the adjacent buttons. Adjacent buttons are those buttons which are directly vertically or horizontally adjacent, not those that are diagonal to the button pushed. So, if an on button is pushed it will immediately turn off, while the buttons that are up, down, left and right from that button will either turn on or off depending if they were initially on or off. The initial objective of this research is to find solutions to an 8xn grid with 7 states (represented as colors) instead of 2. It turns out not all of the 8xn grid games contain a solution (with the 7 states), this research aims to dive deeper into which games have a solution. This particular game is interesting because it can be applied to other variations of the game, where one can change the size and states. Future research could include describing the pattern of how to determine if there is a solution to the game. These patterns turn into rules, which can be applied to other situations. Even though, in this circumstance this research is in terms of a game, most of the procedure, and linear algebra applications that are used to get there can be applied to physics, engineering, and even computer science.

Isomorphic Polynomials: When is a Polynomial Isomorphic to an Even Polynomial?

Hanna Noelle Griesbach (Dr. Chad Awtrey & Dr. Jim Beuerle) Department of Mathematics & Statistics

We quickly learn in single-variable calculus how important polynomials are. They allow us to analyze parts of functions, like their slope, while only needing basic arithmetic properties to construct. The most important points in the data are called the roots, which are where the outputs equal zero. We can express the roots of a polynomial radically up to degree 4, but not necessarily for degree 5 and beyond. The benefit to solving a polynomial radically is that there is an exact answer and thus no error from loss of precision. The field of Galois Theory is motivated by the question of whether a polynomial can be solved radically or if its roots can only be approximated. For certain polynomials, like even polynomials, there are efficient ways to find whether the function is solvable by radicals. Our research explored when a polynomial can be transformed into an even polynomial for easier root computation. This transformed polynomial is characterized as isomorphic. To solve our problem, we looked at the differences between the symmetries of even polynomials and non-even polynomials. The symmetries

are responsible for moving the roots around the function. By looking at how the symmetries moved and grouped the roots, we found that even polynomials possess a symmetry that moves the roots to their reflections. Our research concluded that a non-even polynomial is isomorphic to an even polynomial if and only if it contains a symmetry that does not equal the reflection or the identity but when composed with itself two times yields the identity.

Simulating Long-Term Wealth Distribution in the United States*

Arun A. Kirk (Chapel Hill High School) (Dr. Crista Arangala) Department of Mathematics & Statistics

Increasing wealth and income disparities around the world undermine fairness, productivity, and government influence in global economies. This research project examines the long term effects of unequal wealth sharing by examining what happens when trades between unequal-earning individuals are left unregulated for extended periods of time. An agent-based simulation was created using the programming language NetLogo and represents an unregulated trade environment by allowing human-like agents to randomly move and trade. Agents are programmable beings that follow a set of instructions. Results of the simulation, along with the use of Markov chains, were used to model a changing wealth distribution over a sample of 30 years. Results of the simulation and analysis suggest that wealth inequality is the natural “steady state” of trades. In this context, the unequal “steady state” means that the system naturally gravitates to a high percentage of total wealth concentrated among a few rich individuals. Conclusions from this project support the claim that regulation is needed to support social and economic equality.

The NFL Combine's Effectiveness in Predicting Future Player Success

Thomas M. Loflin (Dr. Crista Arangala) Department of Mathematics & Statistics

The National Football League annually holds a draft in which all 32 teams have the opportunity to select athletes with the intent of progressing their organizations in the future. While teams often have a good idea as to who and what they are searching for, the NFL holds a Drafting Combine in an effort to provide a systematic approach of player comparison. The effectiveness of the Combine has been studied in a number of ways, each targeting a different aspect of analysis centered around the NFL Draft. While specific research has been conducted analyzing the weight the Combine holds in relation to draft order, there is a gap when discussing how good the Combine is at predicting player success. The research conducted in this study will focus on the comparison between the Combine and its ability to predict future player success in the NFL. The study will both look at the relationship between the Combine and draft order and analyze whether or not there is a correlation between draft order and player success. This study will test the hypothesis that the NFL Combine is not mathematically significant in regard to its ability to predict future NFL success using cluster techniques such as principal component analysis. If the hypothesis is supported, the study will introduce alternatives within the Combine process that could yield more predictive results than the methods that are currently in place.

A Mathematical Model of Interspecies Behavioral Patterns

Catherine M. LoGrande (Dr. Crista Arangala) Department of Mathematics & Statistics

Honeybees and zebrafish are two species which generally move and make decisions as a group within their own species. The two species have no way of interacting with one another under ordinary circumstances. However, they are capable of interspecies collective decision-making with the use of simulated robots to influence their movement. The simulated robot in the honeybee tank takes the form of two simulated cylindrical sensors which attract the honeybees when activated; the simulated robot in the zebrafish tank takes the form of a "fish lure," whose direction around the annulus-shaped tank is randomly altered after every 50 steps. Each simulated robot presents a binary decision for both species: either the fish move clockwise or counterclockwise around the tank following the manipulated fish lure, and either the bees move toward the right sensor or the left sensor, only one of which can be activated at any given time. Throughout the project, experiments in which the fish direction influenced the bee sensor activation and vice versa were conducted to determine whether the two species could come to a collective consensus on their movement without physically interacting with the other. This project demonstrates a mathematical model of the two species coming to a consensus when presented with a binary decision and explores the possibility of interspecies collaboration and decision making.

Measuring Gerrymandering: Investigating the Distributions of Party Ratios for Districting Techniques.

Amy E. Moore (Dr. Todd Lee & Dr. Crista Arangala) Department of Mathematics & Statistics

The process of creating districts to be used in political elections in North Carolina has been a cause of concern for many years. This process is completed by hand by the legislature and recently has frequently resulted in maps that are later declared unconstitutional. These maps have been gerrymandered or designed specifically to benefit one political party over another, disenfranchising voters across the state. This project aims to investigate and compare multiple mathematical methods for computationally creating districts. These mathematical methods include the use of applied linear algebra, Euclidean geometry, and Voronoi diagrams. Each method is used to create a large number of theoretical districts which will be numerically represented by the ratio of Democrats to Republicans that would be elected from the set of districts based on previous election data. Using the distributions of the party ratio, we can compare the actual congressional districts to the computational methods and find indicators of unfair districting methods.

Investigating Number Sense in a Math II Course

Maia E. Tice (Dr. Aaron Trocki) Department of Mathematics & Statistics

The goal of this research study was to analyze and investigate students' flexibility in understanding numbers, the structure of numbers, mental mathematics, and the ability to relate quantities to real-world situations, which is called number sense. Thirty-two high school Math II students completed a fourth-grade number sense assessment at the beginning and at the halfway point of the school year. Data were analyzed to assess if number sense knowledge and student reasoning improved over the course of half a school year. Quantitative findings showed that students' number sense did not significantly increase as they progressed in their Math II class and analysis of student work revealed a lack of number sense in some areas. Currently, we are conducting research with fifth-grade students with the same number sense assessment for comparison purposes. These results will inform the larger goal of reframing mathematics education to promote number sense comprehension and maintenance.

Mathematical Modeling of Dengue Fever Focusing on the Mosquito Life Cycle and Preventative Measures

Shannon E. Treacy (Dr. Karen Yokley) Department of Mathematics & Statistics

Dengue fever is a mosquito borne virus that can be caused by any of the four serotypes of the virus, all which belong to the genus *Flavivirus* family *Flaviviridae*. Humans can be infected with the virus after being bitten by an infective mosquito, *Aedes aegypti*. Although an infective mosquito must bite a human for a human to contract the virus, if a non-infected mosquito bites an infected person, the disease can be transferred to the mosquito and continue to spread the virus. Susceptible-infective-removed (SIR) modeling allows for a better understanding of how epidemics spread, and the factors that may have led to the occurrence. When modeling dengue fever, the life cycle and population of mosquitos are taken into account. In a traditional SIR model, the human population is assumed to be in one of three categories, susceptible to the disease, infected by the disease, or recovered from the disease. The mosquito population is also modeled, but only with two categories: the susceptible and the infected. If the species of mosquito that is known to spread the virus was able to be controlled and monitored, the virus transmission would decrease. This research will specifically look at the larval population, and the impacts of preventative techniques on the transmission of the virus. Computational solutions are being created in Mathematica and various systems of equations have been combined to create initial models. The purpose of the research is to determine if a certain preventative measure is modeled in a way that shows it is effective in mosquito control and dengue prevention. One specific preventative measure has not been selected, but instead a comparison between a few methods of prevention will be investigated. These include natural organisms that feed on mosquitoes in the larval phase, omnivorous copepods to prey on young larvae, and mosquito denso-viruses, viruses that replicate the nuclei of the mosquito cells and result in killing the larva.

Analyzing the Effects of a Revised Curriculum in a Content Course for Middle & Secondary Mathematics

Lexi B. Uknis (Dr. Aaron Trocki) Department of Mathematics & Statistics

In the collegiate content preparation of prospective middle grades and secondary mathematics teachers, textbooks are often used to guide the curriculum of the course. However, while there are a wide variety of mathematics education textbooks specifically marketed toward preparing either prospective middle grades teachers or secondary prospective mathematics teachers, there are few textbooks written to simultaneously prepare both. Further, there are even fewer that do so while remaining in alignment with current content and pedagogical standards. To account for this insufficiency, this study centered on creating a revised standards-aligned curriculum for the mathematics content course for middle and secondary prospective mathematics teachers at Elon University and analyzing its effects. Through the thematic analysis of bi-weekly journal entries from the eleven students enrolled in the course, we identified themes that will guide future revisions to the curriculum. Further, through the statistical analysis of pretest to posttest IRT scores, we identified continued areas for improvement in prospective teacher content knowledge and thus improvement in content preparation strategies. Study results indicate a need for a further revised curriculum for proper teacher preparation and generates questions about how to overcome obstacles associated with simultaneously preparing middle and secondary prospective teachers.

Ranking Teams in the NCAA March Madness Tournament

Abigail Weber (Chapel Hill High School) (Dr. Crista Arangala) Department of Mathematics & Statistics

This research project created an effective method to rank teams in the 2019 NCAA 'March Madness' competition using linear algebra techniques. Specifically, adjacency matrices and singular value decomposition (SVD) techniques were used together to rank the teams. Teams were first divided into groups based on the SVD of a matrix containing several statistics for each team, such as games won, points scored, and free throw percentages. For each group, an adjacency matrix of games played was multiplied by a column vector of points scored in order to rank the teams. When SVD and adjacency matrices were used together in this way, Duke, Virginia, and North Carolina -- the top three seeded teams going into the 2019 'March Madness' competition (which Virginia eventually won) -- ranked in the top five, showing that the method developed in this project successfully ranked high-performing teams. These techniques will also be applied to the 2021 March Madness tournament to further evaluate their accuracy and to predict the tournament outcomes.

Media Analytics

A Semantic Network Analysis of Media Analytics Job Postings: Challenges and Opportunities for Media Analytics Curricula in Higher Education during the Pandemic

Ashleigh D. Afromsky (Dr. Jenny Jiang & Dr. Qian Xu) Media Analytics Program

This paper presents the results of a study of nearly 35,000 job postings related to media analytics, a rapidly growing field within communications. Specifically, this paper compares remote positions and in-person job opportunities from the aspects of job titles, highlights, locations, salaries, and types of employers through semantic network analysis. Our findings demonstrate that marketing is the most salient concept in both remote and in-person job postings. However, while remote positions place more emphasis on content creation, in-person positions focus more on social media data analysis and search engine optimization (SEO). Our findings also indicate that large corporations provide the most opportunities related to media analytics, with highly populated cities comprising the top posting locations. For example, New York City offers the most media analytics-related jobs for both in-person and remote positions. Furthermore, we find that remote jobs tend to be more specific and task-oriented, with job descriptions directly related to analytics. In contrast, the description of in-person positions focus more on higher-order skills, specifically management. The implications of these findings are discussed to better understand the opportunities and challenges for the development of media analytics curricula and programs in higher education institutions.

The Representation of Women in Hip-Hop Lyrics Before and During the #MeToo Movement*

Briana C. Edwards (Dr. Qian Xu) Media Analytics Program

This study compares the representation of women in hip-hop lyrics before and during the #MeToo movement through a computer assisted text analysis. The two fixed periods in temporal relation to the #MeToo movements examined in this study were the entire years of 2015 and 2016 for Period 1(before) and 2018 and 2019 for Period 2 (during). The sample of this study included the 344 songs on the yearly Billboard Hot 100 Hip-Hop and R&B charts. The song lyrics were pulled from the Genius

database by using the geniusr package. In order to understand how women are represented in hip-hop, this study first identified different female-related words used during the two periods and then examined the other words used in association with them. The gender of artists was also taken into consideration when making comparisons. In general, the analysis showed that both male and female hip-hop artists used female-related words, such as she, her, and woman, more frequently during the #MeToo movement than before the movement. In particular, female artists adopted more female-related words in lyrics during this movement than before it, although there were fewer female artists on the Billboard Hot Hip-Hop charts in Period 2. Furthermore, derogatory words were more frequently used in conjunction with female-related keywords in Period 2 when compared to Period 1. The analysis of bigrams revealed that Period 1 and Period 2 used similar numbers of unique sexually objectifying word pairs. However, more male artists used these word pairs in Period 1 while more female artists used them in Period 2. The sentiment analysis revealed that there were more negative words such as, stupid, ugly and crazy, used in conjunction with female-related words than positive ones during both Period 1 and Period 2. However, there was an overall decrease in the weight of each negative word in Period 2 when compared to Period 1. Overall, these findings suggest that, while the #MeToo movement may have had a minor effect on the representation of women in hip-hop lyrics, these lyrics are still overwhelmingly disparaging towards women.

Music

Finding his Voice: Beethoven's Formal Innovations in the Early Period Piano Sonata Expositions

Anthony Cancro (Dr. Victoria Fischer Faw) Department of Music

Beethoven's work is generally perceived in three periods, beginning with his first published work. His early stylistic period (~1793-1802) has been described as the time when Beethoven was mastering the formal principles inherited from composers that influenced him such as C.P.E. Bach, Mozart, and especially his teacher Haydn. Although he composed for most genres of his time, piano was his primary instrument, and his 32 piano sonatas now represent a core part of the modern piano repertoire. Close formal analysis suggests Beethoven's early period works demonstrate the emergence of his irrepressible personal voice as a composer within an already existing mastery of conventional contemporary sonata form. This research is important because it informs the scholarship of performance: an understanding of context, compositional processes, and meaning that leads to authentic, informed performance. The methodology comprises a detailed analysis of the expositions (the first large section of a sonata form) of each of the first sonata form movements from Op. 2 through Op. 28. The analysis focused on how Beethoven manipulated sonata form principles; sometimes abiding by the "rules" and sometimes pushing their boundaries. The analysis revealed patterns in his process, especially in his approach to the puzzles inherent to the form, and his approach to their solution. Two significant trends that emerged from the research are how he punctuated the subsections of the expositions, and how he established the secondary key. Concrete outcomes of this research are a spreadsheet detailing and comparing the results of the analysis, a reflection on the patterns that emerge from this comparison, and application of these insights to the performance of one of Beethoven's piano sonatas.

A Strategy for Improving Choral Expression Through an Understanding of Schema

Olivia M. Haley (Dr. Cora S. Palfy) Department of Music

Memorable moments in music evoke emotional responses. Moments of expressivity should be performed to elicit emotion in the audience. While expressivity appears effortless for professional musicians, it can be hard for novice performers to convey emotional intricacies in music. High school choir directors have two challenges to address with students: 1) they must pinpoint moments of expression and 2) find ways to communicate these to students in effort to explain why sections should be expressed a certain way. I propose a methodology for high school choir educators to determine schema and analyze expressive moments that break stylistic patterns. Leonard Meyer (1956) believed that "musical meaning is, in short, a product of expectation" (p. 35). When composers modify stylistic patterns in their pieces, the musical expectations associated with the patterns are broken. These stylistic patterns are referred to as "schema" (Gjerdingen, 2007; Margulis, 2007). The unexpected nature of stylistic changes triggers an emotional response in listeners familiar with the style. I call breaks in schema "expressive high points," as they draw attention. Educators, therefore, can identify schema within a composer's style. In doing so, they can identify expressive moments. I demonstrate this methodology through Eric Whitacre's choral works. I compared "A Boy and a Girl", "Sleep", and "Lux Aurumque." All are similar in mood and appropriate for an advanced high school ensemble. I determine a specific compositional schema within the three pieces, which reveal schemata that characterize Whitacre's style. I then analyze for breaks in the patterns throughout the pieces. I consider the pieces' formal structure, if the breaks across the features fall in similar areas, or if these breaks are audible in a recording of the piece. I then organize my findings into a chart with specific moments of expressivity, including where they are located, how to treat them, and a summary of the general schemata to be used when teaching. My methodology is an effective way of analyzing music to pinpoint expressive moments. While my work is intended for choral directors, the results can be used in any genre to facilitate a student's understanding of expressivity in their repertoire.

An Exploration of Different Methods Used to Enhance Cognitive Empathy in Music Therapy Practice and Formulation of a Practical Intervention

Nicole M. Schapowal (Dr. Cora S. Palfy) Department of Music

"Kinesthetic empathy" has been a growing topic of research in the performing arts and therapeutic fields, which describes the ability for individuals to experience shared emotions through the observation of movements. Most of the existing research surrounding this concept has been focused on dance practices, rather than musical performances and listening engagement. Kinesthetic empathy has the potential to be beneficial specifically in the field of music therapy (Greenberg, Rentfrow, & Baron-Cohen, 2015). Movement interventions in music therapy could possibly be implemented in an effort to increase empathic tendencies within clients who exhibit stunted emotional growth. In order to observe this potential of kinesthetic empathy processes in the music therapy field, this study asked how can kinesthetic engagement during group musical performances improve emotional engagement and cognitive empathy? I explored different pre-existing methods to treat empathy deficiencies, such as autism spectrum disorders (ASD), to observe what techniques are already in use and contribute to methodological advancements for the field of music therapy. I conducted three structured ethnographic interviews with professional music therapists currently working in the field. I coded responses thematically to observe any uses of movement in music therapy, other techniques to treat empathy deficiencies, and commonly used design strategies for music therapy interventions. In this presentation, I present information gained from the interviews and previous literature to design an original intervention centered around kinesthetic empathy in group performance settings. This intervention is structured for child participants, ages six to eight, who would participate in a structured group music performance. In a call-and-response format with various percussion instruments,

participants would produce and mimic movements that symbolize certain emotions that the participants would mimic the feelings of emotions. Data about the participants' empathetic engagement would be recorded using the the Empathy Questionnaire (EmQue), which provides questions for parents to rate their child's empathetic responses and understanding and questions for children to evaluate their own (Rieffe, Ketelaar, & Wiefferink, 2010). While the intervention cannot be tested at the time due to COVID-19, I detail the intervention procedure and discuss its implications.

Contrast vs. Unity, Simplicity vs. Complexity: Beethoven's Exploration of the Theme and Variations Principle

Alexander T. Schmidt (Dr. Victoria Fischer Faw) Department of Music

In 1826, Beethoven created his final work for piano, the monumental "Diabelli Variations," Op. 120, ironically based on a trivial theme. Theme and Variations is defined as "a form founded on repetition, and as such an outgrowth of a fundamental musical and rhetorical principle, in which a discrete theme is repeated several or many times with various modifications." (Sisman, 2001). As a composer, the question that compels me was how Beethoven took such simple material and used it to create 33 variations. The interaction of contrast and unity is a critical principle in musical composition, and this project explores how Beethoven achieved this balance. In order to explore Beethoven's compositional process, this project focuses on musical analysis of every conceivable element of the theme (e.g form, tempo and meter, rhythm, phraseology, melodic content and contour, harmonic progressions, tonal relationships, motivic content, texture, character, articulation, and pianistic idioms) followed by a comparative analysis of each variation with the original theme. The analysis is documented on a spreadsheet in order to observe the composite effect of the combination of these variations into the larger form. The outcome is a deeper understanding of Beethoven's compositional process, the hierarchical relationship of each variation to the original theme, each variation's uniqueness as a discrete unit, and its role in the larger landscape of the entire work. Ultimately, this project demonstrates the compositional process of generating a large, complex structure from the smallest motivic kernels.

Of Love and Loss: The Literal and Metaphorical in Franz Schubert's "Der Hirt auf dem Felsen"

Julia N. Towner (Dr. Scott Windham, Dr. Victoria Fischer Faw, & Dr. Polly Cornelius) Department of World Languages & Cultures and Department of Music

Franz Schubert's "Der Hirt auf dem Felsen" has long captured the attention of singers. This presentation seeks to find out what makes this piece so compelling. Although previous research has explored Schubert's text painting, or the way in which he composes the music as an extension or reflection of the text, this is the first full-length study of "Der Hirt auf dem Felsen." The text, drawn from poems by Wilhelm Müller and Karl August Varnhagen, is subject to multiple, even conflicting, interpretations. When combined with Schubert's extraordinary musical setting, even more interpretive possibilities are introduced. On the surface, the piece describes a shepherd singing on a mountaintop about how he misses his sweetheart. When one digs deeper, the text alludes that the shepherd or his sweetheart may actually be dead. I reached this conclusion by analyzing the text and music together. I analyzed the text (in German) using close reading (Culler, 2012), a process that ties linguistic form to meaning and that looks in particular for multiple meanings, contradictions, and gaps. When analyzing the music, I started by identifying large musical patterns: the piece consists of three sections defined by musical accompaniment patterns, and each section has smaller phrases that give the section its own

musical form. These phrases, in turn, have musical cells, or small rhythmic or melodic designs that can be isolated or used as part of a larger theme, that use text-painting where the textual/musical meaning can be found. I looked specifically at the relationship between musical form and textual form to create a text painting catalog, where I documented every instance that Schubert composed the music as an extension of the text. Finally, I performed the music myself in order to pull all of these interpretive elements together. Schubert's superlative composition in this piece allows for many interpretations to live at the same time, allowing performer and audience to choose—or to refuse to choose, and allow the conflicting interpretations to exist in tension.

Performing Arts

Documenting Sex: A Dramaturgical Investigation of Various Frameworks of Sex Work Regulation

Will Bruno (Dr. Susanne Shawyer) Department of Performing Arts

Whether by bending at the whims of their audience's collective biases or by circumscribing their theatre within their own prejudices, playwrights have long created theatre at the expense of already-marginalized groups including sex workers. In such plays as early as Plautus's Pseudolus and Menaechmi whose sex workers literally do not have dialogue or as contemporary as Andrew Lloyd Webber's Jesus Christ Superstar wherein Mary Magdalene's presence is perceived as a detrimental burden to Jesus's teachings, sex workers remain the archetypal embodiment of a moral "fall from grace" or are merely objectified targets of patriarchy. This documentary play attempts to subvert these harmful stereotypes by centralizing the ways in which the various global structures sex workers exist within create injustices that federal legislators consistently fail to consider, much less attempt to change. Utilizing such documentary drama devices as repetition with a difference, nonlinearity, and current event integration, I also intend to use dramatic models such as Paula Vogel's Indecent, David Henry Hwang's Yellow Face, and Emily Mann's Greensboro: A Requiem to generate an original documentary script. The aforementioned pieces, in one way or another, inform how I want to structure the play's action. Ultimately, I hope the script at least begins to relate sex work to legislation in a way that humanizes sex workers, thereby subverting theatrical stereotypes and advancing dialogue about and understanding of a marginalized group.

Integrating Social Media into Theatrical Storytelling through Projection Design to Cultivate Productive Conversations about Confederate Memorials*

Sydney S. Dye (Dr. Susanne Shawyer) Department of Performing Arts

Social media-based conversations regarding the removal of Silent Sam, a Confederate monument in Chapel Hill, North Carolina, and the role of Confederate memorials in commemorating American history, have lost essential components of a productive dialogue: empathy, compromise, and consideration. As an artist and scholar, I asked: how can social media integration into theatrical projection design initiate and continue a socially empathetic dialogue about the Silent Sam controversy beyond the performance space? In exploring this question, I utilized early 20th century German director Erwin Piscator's little-explored Epic Theatre methodology, which employs documentary-styled storytelling and multimedia integration into live performance, now commonly referred to as projection design, to design digital content for an original full-length play that explore different viewpoints of the controversy. This project tested how Piscator's largely unexplored ideas, updated

with modern technology, impact theatrical storytelling and design, and their ability to intervene in controversial conversations.

Writing Women: Differences in Female Characterization in Drama*

Kelly Farmar (Prof. David McGraw) Department of Performing Arts

The purpose of this project is to examine the disparities in female representation and characterization in playwriting, both in authorship and audience perception. By analyzing the fourteen most produced contemporary plays in the United States of America from the 2019-20 professional season through a contemporary feminist lens, this project is able to reveal a notable difference in female characters (in terms of relevance to plot, stage time, and overall relatability) in plays written by male-identifying playwrights in comparison to plays written by non-male-identifying playwrights. The project was informed by analysis of the primary texts to identify patterns seen in female characters and an IRB-approved survey made available to the public to collect data on perceived differences in female characterization of the analyzed plays. The survey documented participants' emotional reactions and gender assumptions made in response to a series of unlabeled lines of dialogue from seven of the initial fourteen analyzed plays, as well as three additional 20th century Tony-award winning plays to be able to track a potential change in writing over time. Overall, the survey results reveal bias between the way that both male and non-male participants choose to unknowingly identify and categorize the male and non-male speakers of the lines of dialogue. Through the combination of literary review, quantitative and qualitative coding of scripts, survey data collection and analysis, this project highlights the status of women and theater today and serves as a starting point for further and wider research on the topic.

Aoibhneas: Utilizing Semiotic Theory as a Tool in Choreography

Hannah Feldhues (Prof. Renay Aumiller) Department of Performing Arts

This research studies the application of semiotic theory as a movement analysis framework and as a choreographic technique to understand audience engagement with a dance work. My choreography research project, Aoibhneas, is an analysis of dance movement and choreography through semiotic theory. Semiotic Theory is a philosophical method typically applied to literature and physical art; it investigates how people perceive meaning in the world around them through signs and symbols. This project is significant to the dance field because semiotic theory has rarely been integrated into the dance choreography and analysis process. The choreography project drew from this theory to create a movement analysis rubric to study dance movement. An analysis of five full-length contemporary dance pieces was completed with this framework. The findings were then applied to dance composition as a model for understanding communication through movement. Using this research on semiotic analysis, a thirty-minute dance performance piece titled "Aoibhneas," was performed and filmed by Elon students. The creation of this piece and performance process was influenced by the ideas of perception and understanding.

Cuerpo Talk: Expressions of Latinx Identity Through Choreography*

Emily M. Gomez (Prof. Renay Aumiller) Department of Performing Arts

This research is an analysis of Latinx contemporary choreographers and their ability to express their Latinx identity through the lens of transnational migration theory and Laban Movement Analysis.

American contemporary dance forms tend to underrepresent Latinx people and their cultural identifying factors in choreography while appropriating Latinx cultural dance forms into the movement technique. Academically, accurate representation of the Latinx community in the American contemporary dance industry is scarce, especially the analytical choreographic breakdown of Latin movement. Using transnational migration theory, which explains the common cultural occurrences that come about when immigrating from a different country like those previously mentioned within the Latinx community, this research analyzes two prominent Latinx identities in American contemporary choreography, Rosie Herrera and Miguel Gutierrez. The aim was to unfold how Herrera and Gutierrez express their transnational identities through their performance art. Using Laban Movement Analysis, three contemporary works from both Herrera and Gutierrez were qualitatively analyzed for common themes through the lens of transnational migration theory. These common themes evident in the dance works are: memory/family, over-sexualization, and the performing of Americanization. Both Herrera and Gutierrez use Hispanic music, movement, and storytelling in order to convey their ethnic identities within their work. Their incorporation of their Latinx transnational migration identities in their choreographic works in the American contemporary dance field has furthered representation of marginalized communities and provided a greater variety of how contemporary dance is constructed within the larger American society. By analyzing their choreography through this anthropological lens, the research highlights the impact of cultural adaptation and repression of ethnic expression. The results of this study show how transnational migration identities can be categorized to fit within the contemporary dance model, illustrating how Herrera and Gutierrez reclaim Latinx influences in Western contemporary dance which was predicated upon the appropriation of different cultures.

The Physical, Mental, and Creative Implications of Dance as a Form of Play: A Comparison of Collegiate Pre-professional and Recreational Dancers

Sarah J. McNamee (Prof. Lauren Kearns) Department of Performing Arts

This study explores the usefulness of a Dance as Play practice in collegiate dancers. A Dance as Play practice is an improvisation-based dance practice that has mental, physical, and creative implications for collegiate dancers. The Dance as Play practice was inspired by Blatner's acting based play practice as detailed in *The Art of Play: Helping Adults Reclaim Imagination and Spontaneity*.
This comparative study utilized dancers' discussions and feedback to identify these implications and determine the practice's usefulness for pre-professional and recreational dancers. Ten dancers participated in this study; five of them were pre-professional dancers pursuing a BFA in Dance and the other five dance recreationally with at least one hour of structured dance class every other week. In each group of five, the participants completed three Dance as Play sessions. The first session established the general principles of the practice, the second session expanded on these principles with the incorporation of character interaction, and the third session involved applying these principles to a given phrase of movement. The participants completed one pre-session survey before the Dance as Play sessions that evaluated initial stress levels and the causes of this stress. The participants also completed a post-session survey after each of the Dance as Play sessions and engaged in group discussions after each session. Through these methods, dancers shared their thoughts about and experiences with the practice. Recreational dancers discussed the use of this practice as a mechanism to bring comfort and confidence to themselves during improvisation. Pre-professional dancers discussed the use of this practice in choreography and movement creation. The results of this study illustrated that both groups perceived this practice to enhance or shift intention and purpose within movement creation. The data also illuminated the potential significance for the field of dance pedagogy, particularly at the university level.

Yoga as an Intervention to Aid Dancers in the Reduction of Common Spinal Deviations

Lauren G. Mitchell (Prof. Lauren Kearns) Department of Performing Arts

Dance is a physical activity that can impose high stress on the spine, causing risk of injury and possible alteration of spinal structure (Steinberg et al., 2013). The biomechanical aspects of dance technique display that repetition of incorrect placement can cause back pain and discomfort that may lead to long-term injuries and/or spinal deviations. Common spinal deviations among dancers may include scoliosis, lordosis, and kyphosis. The physical component of yoga is consistent with current sports medicine approaches to lower back pain therapy and therefore it is proposed as an effective intervention (Williams et al., 2003). This research highlights the ways in which yoga can target the musculature surrounding the three aforementioned spinal deviations. A literature review was conducted to analyze anatomical, yoga, and dance science information which was then utilized to design the three interventions: scoliosis sequence; lordosis sequence; and kyphosis sequence. The goal of this project is to facilitate a long-lasting dance career by utilizing yoga-based interventions to reduce potential spinal deviations and imbalances.

Embodied Dramaturgy and Its Role in Remote Learning

Tyler J. Okunski (Prof. Kim Shively) Department of Performing Arts

This study investigates the ways in which embodied dramaturgy can help actors, specifically in remote education, better understand their physical instrument to deliver a more truthful performance in a virtual setting. Historically, dramaturgy has been most commonly used in a format that gives actors insight on the world in which their play is set. This study expands beyond this notion and explores tangible elements of dramaturgy and how an actor can better embody the dramaturgical research performed outside of the rehearsal room, studio, or stage. In Elon University's Winter 2020 production of The Wolves, embodied dramaturgical methods were used to deepen the physical story-telling and direction of Sarah Delappe's play about female adolescence. Studying how the deeper messages of hope, fear, insecurity, and gender identity would exist through physical movement, the choreography, rooted in the play's heartbeat of power through the feminist lens, became a form of embodied dramaturgy. Results showed that this methodology enlivens the actor as the new relationship between movement and story creates an overall more truthful performance. Thus, greater satisfaction from the actor arises as their work reflects a more holistic relationship between dramaturgy, direction, and choreography. Through my continued research, I will discover the potential benefits of this applied pedagogy while also navigating the challenges that accompany remote learning.

Physical Therapy Education

Effect of Wearing Cooling Vests and Dual-tasking on Fatigability in Individuals with Multiple Sclerosis

Jessica James (University of North Carolina at Chapel Hill), Chelsea Comeau, & Samantha Everett (Dr. Srikant Vallabhajosula & Dr. Crystal Ramsey) Department of Physical Therapy Education

Background: Multiple sclerosis (MS) is a degenerative disease of the central nervous system that is often accompanied by symptoms such as impaired coordination, pain, and heat sensitivity. Those who

complain of heat sensitivity are typically seen to have increased levels of fatigue complaints while performing two tasks simultaneously, known as dual tasking. While the use of cooling vests has been studied as a potential method to relieve such symptoms, their effects while dual-tasking have yet to be explored. **Purpose:** The current study aimed to determine the effect of using cooling vests on fatigability in individuals with MS while single- and dual-tasking. **Methods:** Fourteen participants diagnosed with MS completing two testing sessions (with or without cooling vest) one week apart. For their first session, participants were randomly assigned to receive either the cooling or non-cooling condition. Throughout each session, participants wore a cooling vest containing four gel packs, while for the non-cooling condition, room temperature gel packs were used to standardize the weight of the vest. At the beginning of each session, an acclimation period of 10 minutes was implemented. Participants completed the 6-minute Walk Test (6MWT), which required them to cover as much distance as possible within 6 minutes. The 6MWT was completed by participants under both single and dual-task conditions, where the single-task condition included solely the 6MWT and the dual-task condition added a story-telling component. Fatigability was defined as the percentage difference between the distance covered in the last and the first minute of the 6MWT. **Results:** A 2-way ANOVA revealed no significant main effect of wearing a cooling vest on fatigability (with cooling vest, 6.29±10.88%; w/o cooling vest, 6.35±8.83%; P=0.973). However, a significant main effect of task type showed that fatigability while dual tasking (8.65±10.89%) was significantly greater than that while single-tasking (4.00±8.80%; P=0.038). There was no significant interaction. **Discussion and Conclusion:** These results highlighted that fatigability during an endurance task is affected by a concurrent cognitive task in individuals with MS. Additionally, cooling vests did not acutely affect fatigability. It is possible that the 6MWT did not cause the core temperature to increase enough for the cooling vest to be effective.

Athletic Identity and Body Image in Female Runners Across the Lifespan

Katelyn C. McCarthy (Dr. Shefali Christopher & Dr. Garrett Bullock) Department of Physical Therapy Education

Female athletes are high-risk for negative body image (BI) due to sociocultural gender norms and pressure to maintain peak performance (Nelson, 2018; Steinfeldt, 2011). Conflicting research has been reported for both low body image and high bodily competence and pride among collegiate female athletes (Steinfeldt, 2011). In consideration of these conflicting findings and the lack of comprehensive lifespan research, the purpose of this study was to examine the relationship between BI and athletic identity in female runners across the lifespan. Six hundred and eighty-eight female runners completed an online questionnaire on athletic identity (AIMS) and BI (Body Appreciation Scale-2). Participants were divided by lifespan stage: collegiate (n=75, mean=29.7years), recreational (n=190, mean=36.1years), pregnant (n=78, mean=42.6years), postpartum (n=140, mean =42.8years), and master (n=205, mean=56.3years) female athletes. ANOVAs with Tukey post-hoc analyses were performed to determine potential differences in AIMS and BI according to lifespan stage. A linear regression assessed the relationship between AIMS and BI, controlling for lifespan stage. Collegiate AIMS score was M=42.9 +/- 10.6 (SD) and BI was M=3.75 +/- 0.68 (SD). Recreational AIMS score was M=43.4 +/- 10.2 and BI M=3.54 +/- 0.72. Pregnant AIMS score was M=41.3 +/- 11.0 and BI M=4.03 +/- 0.61. Postpartum AIMS score was M=46.7 +/- 9.76 and BI M=3.71 +/- 0.73. Master AIMS score was M=45.5 +/- 9.65 and BI M=3.75 +/- 0.73. No significant differences were found between lifespan stage for BI ($p = 0.433$). Differences between AIMS scores and lifespan stages were observed ($p<0.001$). Groups with significantly different scores were postpartum to recreational (Mean Difference (MD) 3.3, p=.028), postpartum to pregnant (MD 5.4,

p=.002), and master to pregnant (MD 4.2, p=.015). No relationship was observed between AIMS and BI [-0.32 (95% CI: -1.39, 0.75), p = 0.560]. Postpartum reported different athletic identity scores than recreational athletes, and both postpartum and master reported different athletic identity scores than pregnant athletes. There is no current clinical importance difference to interpret AIMS score differences, and no follow ups were conducted on changes within participants throughout the lifespan. Future research should identify contributing factors to athletic identity throughout the lifespan and within specific lifespan groups.

Human Motion and Body Position Detection with LIDAR-Based Depth Sensors

Grant Nickell (Dr. Ryan Mattfeld, Dr. Srikant Vallabhajosula, & Dr. Matthew Wittstein) Department of Computer Sciences and Department of Physical Therapy Education

Advances in technology involving computer vision are at the forefront of human-computer interaction, particularly in enabling computers to estimate human motion and body position. A camera provides two dimensional images which cannot be used to determine how far away an object stands. When the XBox Kinect was released in 2010 it revolutionized human motion detection by including depth sensing technology. The XBox Kinect was discontinued in 2017—and while Microsoft has continued development of a similar device called the Azure Kinect, this new device is not fully accessible due to its proprietary nature. Our research aims to create an open-source depth sensor that can track human motion using LIght Detection And Ranging, referred to as LIDAR. While the Kinect uses infrared to measure depth, LIDAR is an alternative technology that has historically been more expensive. LIDAR measures depth by emitting a laser and measuring the time it takes to reflect back to the sensor. Two prevalent forms of LIDAR are flash and collimated. Flash LIDAR emits a wide diverging laser beam in a single pulse; whereas, collimated LIDAR stacks lasers vertically and spins them rapidly. Since driverless cars have begun to use LIDAR technology, its cost is decreasing. To apply LIDAR to human motion estimation, we must evaluate its accuracy for finer movements—a mostly unexplored niche due to driverless cars needing only to estimate the general position of nearby objects. In order to accomplish this goal, we are evaluating against a passive marker motion capture system, the technology used as the gold standard in this field. We performed a preliminary experiment recording the movement of a human subject with the Azure Kinect, the Ouster OS0-128 (collimated LIDAR), the Intel RealSense L515 (flash LIDAR), and the passive marker motion capture system in the Elon Biomechanics Lab using QTM Software (Qualisys AB, SWEDEN). A human subject completed 14 tests of human motion and body position including still poses, walking, and squatting in different directions. Once we have analyzed the joint position data, we hypothesize that LIDAR will perform at least as well as the Kinect in terms of accuracy.

Does Level of Caffeine Improve Physical Performance in Older Adults?

Caroline E. Tunis, Jessica M. Terrell, & Lucy M. Sneader (Dr. Srikant Vallabhajosula & Dr. Stephen Bailey) Department of Physical Therapy Education

Numerous studies have reported power production and endurance benefits of a carbohydrate mouth rinse compared with a blinded placebo (Beaven et al., 2013). It has additionally been shown that the activation of bitter taste receptors in the oral cavity has the capacity to increase corticomotor excitability in male competitive cyclists (Gam et al., 2015). It is unknown whether such benefits exist for older adults. The purpose of this study was to examine the effectiveness of bitter coffee-based mouth rinses to enhance physical performance in older adults. Six males and 10 females (mean age: 67

years) participated in this double-blinded study. The study used 4 mouthwash conditions (decaf control = decaf instant coffee, color control = water and color, decaf instant coffee + low caffeine (0.01%), and decaf instant coffee + high caffeine (0.05%)). Each participant held the solution in their mouth for 20s. Then they performed a 5 times sit-to-stand (5STS) task as fast as possible. The time to complete the task and power while standing was measured for each condition. A one-way ANOVA was performed with alpha set to 0.05. The average (SD) time for 5STS for solutions decaf control, color control, decaf instant coffee with high caffeine, and low caffeine were 9.85 (2.39)s, 9.96 (2.42)s, 9.82 (2.38)s, and 9.86 (2.55)s, respectively. The corresponding average power values normalized to body weight (in m/s.BW) were 1.26 (1.89), 3.60 (10.42), 1.74 (3.78), and 0.77 (0.11). No significant effect of caffeine levels in the solutions on 5STS time (P = .930), and power (P = 0.507) were found. Procedural and subject variable confounds could account for the lack of statistical significance between the 4 conditions. The concentration of caffeine may have not been high enough to elicit a response. Additionally, older adults may not respond to oral stimulation in the same manner younger populations do.

Examining Force Exertion Over a Five Time Sit-to-Stand Task in Healthy Young Adults

Andrew Whyte, Sarah Henderson, & Brandi Wiltshire (Dr. Srikant Vallabhajosula & Dr. Susan Chinworth) Department of Physical Therapy Education

The ability to perform the sit-to-stand task is important to activities of daily function. The five times sit-to-stand assessment is often used in clinical settings as a measure of an individual's lower extremity strength, power, and function. Failure or success to perform the task as fast as possible could offer insight into overall health. While force characteristics during a single sit-to-stand discrete task are known, continuous dynamic force modulation across the five times of sit-to-stand task is currently unknown. The purpose of this experiment was to evaluate power and peak force throughout the five times sit-to-stand task in healthy, young adults. Ten healthy, college-aged individuals were recruited for this study. Participants performed three trials of five times sit-to-stand tasks. Ground reaction force data were collected from the participants' feet via force plates. The power and peak force while standing were calculated using the vertical force. A one-way ANOVA was performed to compare within the five times of sit-to-stand task. From the 1st to the 5th time of performing the sit-to-stand task across three trials, the average values for the power (Nm/s.BW)were as follows: 0.97 ± 0.04, 0.99 ± 0.05, 0.96 ± 0.04, 0.94 ± 0.05, 0.94 ± 0.04 ($p = 0.098$). The peak force development (N/BW) from the 1st to 5th time were as follows: 1.39 ± .03, 1.36 ± 0.03, 1.35 ± 0.03, 1.34 ± 0.03, 1.34 ± 0.03 ($p < 0.001$). The peak force during the first time was significantly greater than that of the 4th ($p = .04$) and 5th ($p = .044$) time of sit-to-stand task. This data suggests that from 1st to 5th time of sit-to-stand task individuals produced less force to generate momentum for seat off to complete standing up. Future studies should examine if similar characteristics are observed in older adults who have difficulty performing this task.

Physics/Engineering

Performance Testing on Chained-Particle Magnetic Polymers for Soft Robotics

Stratton K. Bacogeorge (Dr. Benjamin Evans) Department of Physics, Engineering Programs

Soft robotics comprises a new class of robotic components designed with flexible and adaptable materials to emulate human-like motions. Magnetic polymers are an appealing medium due to their

soft, gel-like nature combined with their responsiveness to magnetic fields. In our lab, we have created novel magnetic polymers containing ordered chains of magnetic particles that are more responsive than regular unchained-particle materials. Chaining the particles boosts their magnetic anisotropy, which increases magnetic torques applied to a sample. Congruent with this experimental work, we are developing a theoretical model that relates magnetic torque to material properties. To characterize the magnetic properties and behavior of these materials, we have built an automated vibrating sample magnetometer (VSM) and a torque magnetometer, and this presentation will focus on the design, construction, and automation of these devices as well as their use in magnetic characterization. Experimental results from these devices will be used to validate and inform a predictive theoretical model which describes the behavior of chained-particle magnetic polymer materials. Ultimately, understanding chained-particle magnetic materials in this way will allow physicists and engineers to optimize current magnetic materials and develop new formulations for an abundance of applications.

Use of Nickel-Silicone Composites for Applications in Magnetic Hyperthermia

Margaret E. Cox, Henry R. Chance, Stratton K. Bacogeorge, & Anne S. Williams (Dr. Jonathan Su) Department of Physics, Engineering Programs

In 1957, Dr. R. K. Gilchrist showed that it was possible to heat magnetic nano-particles via induction. In the biomedical field, this practice has been explored for applications in eliminating bacterial biofilms and cancerous cells. Inductive heating using magnetic hyperthermia will enable us to prevent hospital-acquired infection by allowing us to sterilize medical catheters and tubing in situ. Magnetic hyperthermia is the application of an AC magnetic field used to magnetize particles so that their dipole moments switch directions, which releases energy as heat. Thus, the particles heat up. In practice, the resulting heat is used for the ablation of both tumors and bacterial biofilms. One potential concern is that the temperatures required for sterilization may also result in damage to the surrounding tissue. We used a tissue phantom, an environment that mimics properties of human tissue, to determine the optimal heating profile. This will allow us to sterilize implanted materials while avoiding damage to the surrounding human tissue. Creating a gelatin phantom enables us to accurately model the effect of localized induction heating upon the human body. Preliminary data suggests that the heating rates of chained, higher percent volume, nickel samples are far too high to be safe for human tissue. With proper temperature controlling equipment, this issue could be avoided.

Extracting Cellulose from Invasive Species to Produce Medical Gauze Pads

Chris J. Dellosso, Paloma C. Dettloff, Harry C. Masker, William G. Tunis, & Emma F. Walker (Dr. Jonathan Su) Department of Physics, Engineering Programs

As the development of medical fabric made from biodegradable material advances, there is an opportunity to create affordable gauze pads for individuals and health clinics in lower-income communities. Our research focuses on extracting cellulose from invasive plant species to transform into medical gauze pads. Cellulose is an organic substance found in the cell walls of plants and is biodegradable. Unfortunately, many superabsorbent materials do not biodegrade, which is why we aim to create an absorbent material from the cellulose of English ivy *(Hedera helix)* and princess tree (*Paulownia tomentosa)*. These plants are found in abundance throughout the southern US and are classified as an invasive species in North Carolina. Extracting cellulose from English ivy, as opposed to silk or cotton, is more sustainable for the environment and cost-effective for communities in need. In 2019, the poverty rate in Alamance County was 3% higher than the national average, and the number

of people without health insurance was 6% higher. These wealth disparities between Alamance County and the US motivate us to find effective methods to create a potent and affordable health care product that is both economically and environmentally sustainable. Once a source of local invasive species was obtained, we extracted cellulose by submerging the material in a basic 1M sodium hydroxide solution over a period of several weeks. The extract was then mechanically pulped. This process is followed by drying so all the moisture is wicked away from the cellulose extract. Future research will focus on pressing and forming the extracts into gauze pads. Results thus far show this process could produce testable material as soon as three weeks. The quantity of liquid absorbed by the material will determine the potential applications of the material produced. We aim to create gauze pads because they have low absorbency rates. This allows flexibility when producing a biodegradable and affordable alternative that may be equally efficient to marketed gauze pads.

Integration of Wonderware Software at AKG of America: Optimizing Efficiency and Traceability at the Industrial Furnace

Samantha R. Dominguez, Shalexzandra A. Dunkley, Kathryn G. Ellington, Timothy P. Verlander, & Timothy Olson (Dr. Jonathan Su) Department of Physics, Engineering Programs

The AKG Group is a global industrial cooler manufacturing company with a branch located in Mebane, North Carolina. The manufacturing of their products is done through a basic assembly process that becomes inefficient once the product reaches the vacuum furnace for brazing. All of the data at this step in the assembly, such as furnace location, product batch number, date, is recorded on paper and manually input into the furnace computer for each individual part. This leaves room for potential operator error and is inefficient because if this product fails a quality test later down the line, tracing its history through the manufacturing process requires a manual search through hard copy files. The storage of all this data should be automated to avoid human error that stems from manually inputting data. The company already automates a portion of the product data with a stamped barcode. Ideally, this same barcode would hold all the product data, including the data usually collected by hand at the vacuum furnace. The team intends to integrate the plant's power BI software, Wonderware, with the current Zebra scanning system used in their manufacturing process as a means of automation. Each position in the furnace will be assigned a unique identifier that will add as a data variable attached to the stamped barcode. The Wonderware Historian already captures data from all over the plant floor and adding this extra identifier will make the data collected at the furnace more easily accessible further along in the manufacturing process as it can then be queried from the database.

Constructing a Method to Detect Helicoils in a Cooling Tank

Colleen Egan, Alex Hebert, James Warren, Orlanzel Washington, & Jackson Abele (Dr. Jonathan Su) Department of Physics, Engineering Programs

AKG of America builds nearly a thousand cooling tanks per day. These tanks are made of cast aluminum, and multiple threaded holes are machined into the tank. Then, 4-8 stainless steel helicoils are inserted into these holes manually by a machine operator. Helicoils are tiny coiled-wired treads that are used to strengthen and reinforce soft alloy components, such as aluminum. Often operators forget to place the helicoils, and this goes undetected until the part is in the field. This project aims to research and design a system that detects the presence of helicoils in the aluminum tanks. Using UV dye, a camera for thermal imaging, and a metal detector the group plans to create a solution for the company that has the potential to lower costs and eliminate waste. In the first

method helicoils are given a coating of UV dye, and are then placed into the cooling tank. The tank is then placed in a room illuminated by UV light. The presence of the helicoils can then be determined by observing the cooling tank with a camera. In the second method, high heat is applied to the tank. Since stainless steel heats about ten times as fast as aluminum, the differences in heating can be detected using an infrared camera. In the third and final method, the group is testing a ferrous-only metal detecting sensor that will only trigger in the presence of stainless steel. The research is ongoing, with the next steps including finalizing the tests of each method, comparing the effectiveness of detecting helicoils, and presenting AKG with the method that is the most cost effective.

On the Development of Affordable Gas Sensors for Monitoring Biogeochemical Processes in Constructed Wetlands

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Natural wetlands provide numerous benefits to the ecosystem that contribute to human health and well-being. These benefits include flood abatement, sediment and nutrient retention, water purification, and groundwater replenishment. Artificial Wetlands created by humans can serve the same purpose as natural wetlands, and therefore are being used to treat polluted water. Herein, we report on the development of sensors designed for monitoring gaseous emissions from *constructed artificial wetlands* to highlight another benefit, that of conversion of potentially toxic chemicals in water runoff to less harmful ones. We will present data on methane and carbon dioxide emissions measured using programmable logic devices (PLDs) from wetlands vegetation, *carex lurida* and *juncus effusus,* as a means of determining the most effective wetland vegetation for harmful chemical remediation. Initial work showed the ability to detect parts-per-million levels of these gases with good accuracy and sensitivity compared to commercial sensors. We have since turned our attention to the design and fabrication of portable enclosures fitted with our PLD-sensor devices for ultimate use in remote artificial wetland settings. We have worked closely with a North Carolina company (Floating Wetlands Solutions, Inc.), an expert in artificial wetlands systems, to produce 3*ft* x 4*ft* floating platforms that can accommodate wetland vegetation. The porous platform enables root growth through the platform into the water body to most effectively interact with reservoir chemicals. Due to the lower prices of our version, the PLD-sensor devices offer an economical means of remotely monitoring bio emissions from artificial wetlands which will be highlighted in this presentation.

Constructing A Portable Sub-Surface Optical Coherence Tomography Imaging System

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Optical Coherence Tomography (OCT) is an optical analogue to Ultrasound, in that the time delay of light waves scattering from objects beneath the surface of a sample is used to determine the depth of those objects. OCT is a coherence imaging technology, meaning that it is capable of spatially resolving subsurface features in samples like biological tissue to obtain cross-sectional images. We are currently building a high-resolution fiber-optic based OCT system that will be used to assess the structural properties of diseased tissue, such as cystic fibrosis mucus or cancerous breast tissue. Previously students have developed a series of graphical user interfaces (GUIs) to control the hardware comprising this system. Here, we developed a main GUI that combines those previously created in order to gain more complex functionality for the imaging system. Additionally, we have rebuilt the hardware for the system to make it portable. This project will result in a portable imaging system

capable of capturing real-time videos, 3D images, and micro-porosity maps (showing the microscale structure of tissue related to disease progression) for biological tissue. The portability of the system enables remote studies to be conducted at doctor's offices and labs in other facilities. Here, we present the updated GUI and new hardware construction. This work is ongoing, with next steps including realignment of the system, demonstration of the GUI's advanced capabilities, and preliminary studies in viscous fluids to validate the system's ability to quantify the subsurface physics of viscoelastic tissue.

On the Development of Affordable Electrochemical Devices for Monitoring Biogeochemical Processes in Constructed Wetlands

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Constructed wetlands are engineered water retention basins that rely on natural processes for the treatment of wastewater from stormwater, landfill, and agricultural runoff. These systems use vegetation, soil, and organisms to remove common pollutants through chemical, biological, and physical processes. The oxidation-reduction potential (ORP) of bioretension basins is an important indicator of the health of a water body and is commonly used to assess wetland efficiency. In this study we report on the design and development of affordable electrochemical ORP devices for use in constructed wetlands. Preliminary measurements of water from a bioretension basin on Elon University's campus revealed an oxidation potential of 0.10-0.25 volts, as measured via a commercial electrochemical potentiostat; a corresponding reduction potential of 0.30-0.45 volts was measured. Water samples showed a decrease in oxidation and reduction potentials as a function of water collection depth, as would be expected. Initial measurements with a programmable logic controller (PLC) integrated with an ion selective sensor for measuring ORP showed a value of ~0.19 volts which is comparable to near-surface water samples measured with the commercial potentiostat. The PLC offers a much more affordable approach for field applications with the added capability of remote data monitoring. We have recently obtained a modular platform from Floating Wetland Solutions company and have modified the platform for addition of various types of vegetation. We will report on measurement of ORP as well as nitrates, ammonium, and other chemicals in proximity to these individual plants and plant combinations to determine optimal constructed wetland implementations.

Imagining Project Goals for a Project-Based Learning Experience in Elon's Biomedical Engineering Curriculum

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Current design projects in the Elon engineering curriculum are largely mechanically focused. With the development and evolution of functional devices from low-cost components, there is an opportunity to devise project-based learning experiences for students interested in biomedical engineering. We have partnered with Engineering World Health - a global non-profit organization that promotes biomedical engineering education - to expand the use of their heart rate monitor. This medical device will serve as the design project to create a project-based learning experience in Elon's Engineering Design for Service course (EGR 221). When creating new learning experiences, it is important to ensure that the learning goals, activities, and assessments align. The goals-activities-products-assessments (GAPA) framework is one tool for achieving alignment in project-based learning. We will apply this framework as an analytical tool to understand the experiences of students enrolled in Engineering Design for

Service. This also allows us to gain insight into how a specific project can contribute to student learning and to compare the same project across different engineering courses. This work aims to demonstrate the utility of a project goals framework in defining student-centered learning goals for a new learning experience.

Magnetically Anisotropic Materials for Remote Heating and Sterilization of Silicone Medical Devices

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Transdermal medical devices, such as silicone tubing that penetrates the skin, are a leading cause of hospital-acquired infection. Bacteria on the surface of such devices tend to form layers called biofilms, which are particularly difficult to eliminate with antibiotics. One promising alternative is to use magnetic hyperthermia, in which small magnetic particles, such as iron, can be heated remotely by applying an alternating magnetic field. By embedding iron particles in silicone, we have engineered an iron-silicone composite material that can be heated quickly to temperatures high enough to eliminate bacterial biofilms. Furthermore, we have found that by applying a static magnetic field while the composite cures, the iron particles will form chains within the silicone, resulting in increased magnetic anisotropy within the sample. It has been shown that this increased anisotropy enhances magnetic heating. We have designed and built a novel magnetic oven which allows us to make both chained and unchained composites in a variety of iron concentrations, and have shown that in all cases the chained-particle samples heat more quickly than unchained controls, yielding heating rates as high as 3.3 °C/s. To further investigate this empirical relationship, we are using a house-built torque magnetometer to directly measure magnetic anisotropy in our samples. These measurements will then be correlated with magnetic heating rates measured by infrared thermometry to develop a predictive physical model. Ultimately, understanding this correlation could lead to improved magnetic heating yielding better materials for self-sterilizing medical devices, reducing the incidence of hospital-acquired infection.

Political Science & Policy Studies

The Responses of Women of Color in the House of Representatives to President Trump's Tweets*

Mikaela D. Benton (Dr. Laura Roselle & Dr. Jessica Carew) Department of Political Science & Policy Studies

This research explores the responses of thirteen women of color in the House of Representatives to President Trump’s tweets about them from his first day in office, January 20, 2017, until March 31, 2020. While Twitter has been increasingly used by more politicians as a way to connect with their constituents, President Trump has been the first president to consistently use Twitter to communicate with other diplomats, his own colleagues in Congress, and the rest of the public (Pain & Chen, 2019). Women of color in particular are underrepresented in Congress (Bauer, 2015; Pearson and Dancy, 2011) and face additional stereotypes in their positions of leadership (Sanchez- Hucles & Sanchez, 2007). This study focuses on the strategies these women employed in responding to President Trump’s tweets. Whereas many studies have focused on the content of President Trump’s tweets, this focuses specifically on the agency of the women in their responses. The thirteen women that he tweeted about and to are: Alexandria Ocasio-Cortez, Val Demings, Veronica Escobar, Tulsi Gabbard, Jenniffer Gonzalez, Sheila Jackson Lee, Pramila Jayapal, Eleanor Holmes-Norton, Ilhan Omar, Ayanna

Pressley, Rashida Tlaib, Maxine Waters, and Frederica Wilson. Tweets were gathered from each individual Congresswoman's twitter page using Twitter's advanced search function, a seven day range was given from when Trump initially tweeted at the Congresswoman. Tweets were coded according to seven different strategies: symbolic rerouting, contesting the source, contesting the content, contesting the strategy, humor differentiation, assertive/educative claims, and pop culture references. Of the 120 tweets collected, 70 were coded as direct responses to President Trump's tweets. My hypothesis predicted the most frequent strategy the Congresswomen use would be that of contestation in an effort to make their platforms and policies clear. The strategies used the most were contesting the content, symbolic rerouting, and contesting the source. These strategies used most frequently illustrate that these Congresswomen of color address the content, the source, and the direction of the narrative. This research contributes to the field of literature surrounding the use of social media by politicians and President Trump and the challenges that women of color face in the House of Representatives.

Congressional Candidate Quality: Examining the Effects of Candidate Quality in the 2018 Congressional Freshmen Class

Mackenzie B. Ferguson (Dr. Carrie Eaves) Department of Political Science & Policy Studies

Newspaper headlines after the 2018 midterm elections focused on the unprecedented number of women candidates, candidates with diversity, and candidates with no prior political experiences who were elected to the 116th House of Representatives. A candidate's quality, determined by whether or not they have previously won elected office, has been an important variable for predicting a candidate's success in congressional elections. My research examines these newly elected freshmen members of Congress to examine what factors helped candidates to be able to compete against their quality competitors. What other experiences or groups help candidates to make up for not being considered quality candidates according to Jacobson's measure of quality? In this research, I use both quantitative and qualitative methods to examine the 2018 House of Representatives freshman class. Using an existing dataset of congressional elections by Jacobson, supplemental background research on the freshmen members, and case studies of selected 2018 House freshmen, I examine the ways that the 2018 election was an outlier in terms of patterns of candidate quality. Through my research, I find the 116th House of Representatives freshman class had a record number of women, diverse, and non-quality candidates. The decline of quality candidates in recent years was due to non-quality candidates who were able to level the playing field through having support from outside groups and other important factors to voters, such as diversity. If the data becomes available prior to SURF Day, I will also include a comparative analysis of the 2020 election.

Female Narratives in Forced Migration: Syrian Refugees in Turkey*

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Since 2011, 6.2 million refugees have been displaced from Syria into surrounding communities and beyond. The largest refugee communities are found in Jordan, Lebanon, and Turkey, and these groups have been studied extensively since the civil war began. Going beyond existing quantitative research on survival, violence, and assault, this study aims to provide qualitative depth and texture to the experiences of refugee women navigating new environments. The investigation explores the narratives of refugees who have been displaced from Syria to Istanbul, Turkey as a result of the Syrian civil war. With a convenience-based snowball sample which utilized the resources of a refugee community

center, 22 women and 3 men were interviewed about their experiences with integration into the Turkish state and society. The social, political, and medical adversity and challenges that accompany integration for Syrian women in Turkey include language barriers, discrimination, and a clash of identity and values. The findings of the study describe the narratives of female refugees in how their roles and identities have changed as a result of forced migration, and how these identity changes, particularly as they relate to gender roles and responsibilities, are impacting their families. Many of the participants reflected positively on these identity shifts, expressing hope for the future of their daughters and the future of Syria.

Racism and Environmentalism: How Racial Resentment Reduces Support for Climate Policy*

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The dominant historical pattern of American cities is ecological segregation by racial-ethnic status, which results in higher concentrations of societal bads, such as chemical dumping and waste collection, placed near neighborhoods predominantly filled by People of Color. This trend is imposed on communities of color not by nature, but by targeted policy. Moreover, previous literature shows trends of racial resentment behind disbelief in the existence of climate change, which has shown detrimental effects for non-white Americans. To study the ramifications of this phenomenon further, this paper inquires how racial resentment impacts Americans' individual level of environmentalism, or the care one feels toward the preservation of the environment. This question provides the opportunity to explore how race, political ideology, and racism impact the policy preferences of voters. In this case, racism and racial resentment are qualified by measuring the disparity between participants' feelings toward white people and People of Color. This research uses OLS regression model analyses from the 2016 American National Election Studies database to show that as levels of whiteness and conservative political ideology increase, so does racism, and that this increase in racism is correlated with a decrease in environmentalism. In summary, it is found that white, conservative Americans show heightened levels of racism and, therefore, more often deny the existence of global warming, as well as oppose increased federal budget spending on progressive climate policy. That is to say, racist attitudes reduce support for climate policy, the consequence being that non-white Americans bear a disproportionate cost of that burden. By acknowledging this trend, it is necessary to question the ways in which white, conservative government officials consciously fail to protect their marginalized constituents from the damaging effects of global warming. To address this inequality, increased liberal and racially diverse representation in government office is proposed.

Confronting Islamophobia: Can Media Framing Create Greater Acceptance of American Muslims?*

Megan Z. F. Noor (Dr. Kaye Usry) Department of Political Science & Policy Studies

Is there a way of speaking about American Muslims that can improve acceptance of this often-marginalized group? This research examined how activists, politicians, and journalists frame American Muslims in the media. In this study, news articles and speeches from political activists and United States presidents were collected and analyzed for positive frames about American Muslims. Results showed that the most common frames among these media include "Muslims are patriotic and have a strong connection to American identity," "Muslims resist and thrive in spite of Islamophobia," and "Muslims are members of a broader community." Next, these frames were formatted into short vignettes and presented to undergraduate students, followed by a survey to measure their opinions

toward Muslims. Overall, students expressed very low levels of Islamophobia, but the "Muslims are patriotic" vignette showed the greatest potential to reduce hostility. Finally, the vignettes were converted into a video format to increase their salience and were presented to a convenience sample of residents of Alamance County, North Carolina, followed by the same survey to measure Islamophobia. In this survey, participants still exhibited rather low levels of Islamophobia, but in this case, the "Muslims are members of a broader community" frame led to the greatest reduction in Islamophobia. These results provide preliminary insights into how to deploy those frames for activists and news organizations dedicated to combating Islamophobia in the United States, while also emphasizing the need for further, more systematic research into the effects of positive media frames on public opinion toward Muslims.

Investigating the Asian Infrastructure Investment Bank's "Best Practices" Commitment in Project Transparency and Accountability

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The Asian Infrastructure Investment Bank (AIIB), a Chinese-led multilateral development bank, opened in 2016. The AIIB claims to uphold global best practices in mitigating environmental and social impacts of its projects, and in its own transparency and accountability, and hence has established its Environmental and Social Policy and Project-affected People's Mechanism. The limited literature on the AIIB mainly addresses its financial impact in Asia and beyond, its soft power potential for China, and its governance structure. While there is a specialist literature on transparency and accountability for the World Bank and established regional development banks, similar literature analyzing AIIB operations is only beginning to emerge, and this study fills this gap in the scholarship on the political economy of multilateral development banks. It provides a comparative case-study analysis of three AIIB projects in India: one co-financed with the World Bank (Amaravati Sustainable Capital City Development Project), one previously funded by the World Bank but later taken up independently by the AIIB (Mumbai Urban Transport Project), and one AIIB standalone project (Andhra Pradesh Urban Water Supply and Septage Management Improvement Project). All three projects are categorized as environmentally and socially high impact, particularly in their land acquisition and resettlement components. The first two were both subject to complaints to the World Bank Inspectional Panel. The study seeks to understand the AIIB's actions and to investigate its claim of upholding established best practices in social and environmental impact mitigation. As the AIIB is led by nondemocratic China, this study also aims to understand whether the AIIB is susceptible to the kinds of civil society pressures experienced by the American-led World Bank in the case of India, itself a democracy with strong activist traditions. Qualitative data will be collected through process tracing in the form of project staff interviews, media sources, external reports, official documents of the AIIB and World Bank, and government documents on the selected project. Preliminary results indicate that AIIB so far has largely followed the World Bank's lead in transparency and accountability, but questions remain about its independent capacities as it shifts from primarily co-financed to standalone projects.

"A Black Daughter of the South": An Analysis of Local and National Coverage of Stacey Abrams' Gubernatorial Campaign*

Pearl E. Sullivan (Dr. Laura Roselle) Department of Political Science & Policy Studies and International & Global Studies Program

In 2018, Stacey Abrams, the Minority Leader in the Georgia State House of Representatives, campaigned to be the governor of Georgia. The campaign garnered national attention as Abrams, the first Black woman to be a major party's nominee for governor in the country, excited Democratic hopes of turning Georgia blue (Bacon 2018). Between the start of 2017 and the beginning of 2019, the Atlanta Journal Constitution published 611 articles that mentioned Abrams, and the New York Times published 285 stories related to her candidacy. This paper explores the differences in the local and national portrayal of Abrams' campaign and how the coverage reflected media trends in the presentation of women of color, specifically female candidates of color. The research finds that the national coverage of Abrams both mentioned and focused on Abrams' identity as a Black woman to a greater extent than the local coverage. Additionally, the paper shows that neither local nor national outlets used stereotypical framing common in the coverage of women of color in politics in their coverage of Abrams' campaign.

Revisiting Feminist Standpoint Theory with María Lugones*

Anna V. Watson (Dr. Liza Taylor) Department of Political Science & Policy Studies

This project seeks to revisit feminist standpoint theory through the lens of María Lugones' "traveling epistemology." Lugones posits that the production of theory should be based on the lived experiences of those situated within the intersections of oppressed identities. Further, this theory-making should be done in concert with others, as dialogue serves as a critical epistemic tool. With these tactics in mind, she offers her traveling epistemology as a way for theorizers to both travel to each other's worlds, and for those in privileged positions to come to know the lived experiences of the oppressed. While such concepts would seem to bring considerable conceptual sophistication to discussions centered on the unique knowledge produced from oppressed social locations and the collective oppositional consciousness that theorizing from this standpoint creates, feminist standpoint theory texts rarely mention Lugones, let alone name her as an influential thinker in this area. In the context of feminist standpoint theory, Lugones is referenced primarily in relation to her article with Elizabeth Spelman, "Have We Got a Theory for You!", a work that clearly emphasizes the value of knowledge produced by theorizing with and from oppressed standpoints. This project seeks not only to make sense of this oversight, but to consider what might be gained by inflecting feminist standpoint theory with Lugones' traveling epistemology. Through an interpretive textual analysis of the fundamental texts within feminist standpoint theory and its associated debates, this project seeks to demonstrate that Lugones offers invaluable insight into how the privileged perspective of the marginalized rests not in their claim to "truth" but their claim to politics; and specifically, in their ability to map and ultimately contest mobile, fluid power.

Psychology

A Meta-Analysis of the Association Between Parental Psychological Control and Youth Emotion Regulation

Lauren E. Beliveau & McKenzie A. Boyer (Dr. Anne-Marie Iselin) Department of Psychology

Parental psychological control, employed by parents to stifle/invalidate the child's perspective to control their emotion state, has previously been investigated in relation to several youth outcomes including emotion regulation. Emotion regulation is the ability of a child to manage and adapt to their

emotion state after an emotional experience. Past meta-analyses have reviewed relations between youth emotion regulation and internalizing/externalizing behaviors. The goal of this meta-analysis is to expand on this evidence and review associations between parental psychological control and youth emotion regulation. We will investigate how strongly emotion regulation strategies relate to parental psychological control across studies that examine youth from culturally diverse populations from several different countries. Our search of empirical articles used three databases: Psycinfo, Medline, and Social Services Abstracts. Search terms included all forms of the phrases psychological control, emotion regulation (including strategies such as guilt induction, rumination), and youth (e.g., adolescents). Our master candidate list contains 6,955 articles (duplicates removed). Main reasons for article exclusion included lack of psychological control or emotion regulation, a non-quantitative study (e.g., reviews), and having an adult sample. All studies will be coded on primary effect sizes and moderator variables by March 2021. To ensure interrater reliability, two researchers will independently code all study variables for at least 25% of the articles. First, we hypothesize overall effect sizes (i.e., *r*) to be small to medium in size with significant variability in magnitude across studies. Second, we hypothesize that variability in effect sizes will be explained by moderator variables coded from characteristics of the studies (e.g., publication type) and samples (e.g., gender, country). Our findings will identify how strong the relation between parental psychological control and youth emotion regulation is across studies (i.e., how generalizable) and highlight variables that impact the strength of that relation (e.g., country). Study implications will guide professionals working to improve youth's emotion regulation skills across several different countries with how much emphasis to place on parenting level interventions. These findings will enhance the generalizability of this relation to be applied globally in culturally appropriate ways across diverse populations.

Developmental Niches of Infant Motor Development in the USA

Sofia Cordova (Dr. Sabrina Thurman) Department of Psychology

Within a culture, multiple environmental structures affect child development in context-specific ways. These structures, explained in Super and Harkness' 'developmental niche' framework (1986), include multiple subsystems. The first subsystem involves physical and social settings in which children live (e.g., home and play environments, climate conditions, play equipment). The second involves customs surrounding child care and rearing (e.g., socialization goals and practices, maternity leave, attending classes such as baby swimming). And finally, the third subsystem involves caregivers' beliefs (e.g., the role of parents in shaping child development). Motor development research has shown how certain aspects of these subsystems influence infants' motor habits and skill acquisition. For example, beliefs and practices stressing infant body stimulation are associated with earlier motor skill acquisition. However, much research on developmental niches has focused on trends observed in other countries. And, research done in the USA has only focused on one or a few of these environmental structures, but has not taken a comprehensive developmental niche approach. Here, we ask: How are the subsystems described above organized in the USA, from broad ideologies and values, to more local, context-specific influences? For example, the USA has experienced a decades-long shift away from multi-generation households to nuclear families, and we emphasize individualism and self-reliance. However, the USA is extremely vast and diverse, with many regional cultures and practices, landscapes, climate conditions, and socioeconomic influences. We also know caregiving practices can differ based on the gender of the parent and infant. We are currently collecting online survey data from 200-300 first-time parents of infants aged 1 to 7 months who currently reside in the USA. The surveys assess parental beliefs about motor development in infancy, parenting practices, infants' daily motor habits, and infants' motor development. Using the developmental niche framework described above,

our preliminary results with an early sample of the data (approximately 75 parents) may capture trends in multiple context-specific structures within the USA (both broad and local), which could shape infant motor development in meaningful ways. These data will inform a larger cross-cultural study examining differences in parental beliefs and practices across multiple countries.

Infant Locomotor Experience and Cognitive and Social Development: A Review

Sofia Cordova & Grace Feiner (Dr. Sabrina Thurman) Department of Psychology

The onset of self-produced locomotion in infancy, when infants begin to crawl and walk, is a widely anticipated and celebrated milestone. For the first time in their lives, infants become able to move their bodies in space independently from their caregivers. This important milestone has been extensively studied, as it not only provides more opportunities for movement and physical exploration, but it is also associated with advancements across multiple domains of development (e.g., cognitive, language, socioemotional). Furthermore, the timing of the onset of locomotion is associated with important consequences on the timing of later skills. The concept of 'developmental cascades' has been used to describe these multi-leveled changes across domains, but also characterizes cumulative effects of development, both in the short- and long-term. In this review of the literature, we use a 'developmental cascades' framework to synthesize research findings showing how self-produced locomotion enables capacities that are useful or even necessary to develop more complex skills across multiple domains and varying time periods of development. We will discuss cognitive improvements in abilities such as problem-solving behaviors (e.g., memory skills involved in navigating around furniture to retrieve a toy, determining how to manipulate functional objects such as a fork), transfer of previously developed motor skills onto novel tasks (e.g., climbing stairs), and exploration (e.g., adopting different postures to move throughout the home). We will also address advancements in infants' social skills which are associated with the onset of locomotion, including infant interactions with caregivers (e.g., increased communication using visual and verbal cues). In addition to some of these concomitant changes, our analysis will focus on how early advancements in locomotor experience provide an accumulating foundation for future experiences, such as academic success and social competency upon entering school. The 'developmental cascades' framework provides a fruitful lens through which examining the relationship between developmental changes over time and across domains can be understood. The current 'developmental cascade' example of infant locomotion could support a more holistic view of infant development in the general public and all people who interact with and care for infants.

Multisensory Integration and Associative Memory in Aging

Jordyn L. Cowan & Madison K. Tarkenton (Dr. Amy Overman) Department of Psychology

Age-related structural and functional changes in the brain lead to memory changes that cause older adults (OA) to be less effective than younger adults (YA) at linking together pieces of information in memory, a process called associative memory (Mozolic et al., 2012). However, when visual and auditory information are presented simultaneously, both OA and YA register and process the stimuli faster than when the visual or auditory component is presented alone. Recent studies show that the difference between multisensory processing and unisensory processing is greater for OA than it is for YA. While age-related cognitive changes have often been viewed as detrimental to cognitive performance, this study investigated whether the multisensory gain that OAs demonstrate might improve their memory performance for multisensory pairs. 35 YA (ages 18-21, mean age = 18.9) and 32 OA (ages ≥ 65, mean age = 72.6) were presented with an associative memory task and a

multisensory detection task. Preliminary results show that both YA and OA responded faster to multisensory stimuli than to unisensory stimuli (YA: $t(33) = 9.93$, $p < 0.001$; OA: $t(28) = 7.43$, $p < 0.001$), but multisensory gain was not significantly different between the two age groups ($t(61) = 0.785$, $p = 0.435$). Furthermore, YA were more accurate at discriminating old from new pairs on the memory task than OA (d'; $t(61) = 5.22$, $p < 0.001$). YA showed significantly improved memory for unrelated than for related pairs ($t(66) = 4.51$, $p < 0.001$), but OA showed no difference in memory performance between the two conditions ($t(56) = 0.88$, $p = 0.380$). There was no significant relationship between memory performance and audiovisual integration for either YA ($r = 0.246$, $p = 0.161$) or OA ($r = 0.029$, $p = 0.391$). These results will help advance our understanding of the effects of aging on cognitive performance by investigating the relationship between multisensory integration and associative memory performance.

Factors of Medication Adherence of Black Women living with HIV During Covid-19*

Jenna N. Dahl (Dr. Buffie Longmire-Avital) Department of Psychology

HIV cases have been dropping drastically since 2010. However, the southern region of America maintains high rates of HIV diagnoses. In this region and throughout the United States, Black women are disproportionately at higher risk for HIV as they account for over 60% of HIV cases in American females (CDC, 2020). Yet, Black women are still underrepresented in HIV research as well as excluded and restricted from treatment and preventative interventions. In collaboration with a community partner, 51 self-identified Black American women living with HIV, residing in the south participated in this online anonymous survey study in June of 2020 that evaluated adherence, loneliness, and fatigue. Women were recruited through social media posts and email listservs. Approximately, 40% of the women indicated that they lived in Georgia, and the average age of participants was 43 years old. Nearly 54% ($n = 26$) of the women reported near perfect adherence during the pandemic (i.e., they missed fewer than 8 doses) and 60% ($n = 31$) of the women perceived their adherence during the pandemic to be the same as their adherence prior to it. When asked to describe the factors that have contributed to their adherence during the pandemic, three themes emerged: (1) health maintenance, which included fear of contracting COVID and a desire to have an undetectable viral load; (2) stress and well-being, such as struggles with depression, anxiety, finances, and faith; finally, (3) change in routine. Women reported that having more time either helped focus on their adherence or contributed to forgetting their medication. The women also reported struggles maintaining consistent supplies of medication due to unpredictable mail delivery. There was a significant relationship between loneliness and fatigue, $r = 0.62$, $p = .05$; women experiencing greater amounts of loneliness were also reporting greater amounts of fatigue. These findings shed light on the added challenges to adherence that Black women with HIV experience during the COVID-19 pandemic. Information and support on how to reduce risk and stress while navigating a pandemic with a chronic condition is essential.

Evidence for Habituation of Locomotor Behavior in Harvester Ants

Carly T. DeSesa, Olivia G. Haskell, & Laura Ackerman (Dr. William Schreiber) Department of Psychology

Non-associative learning is a source of behavioral change reflecting an animal's previous experiences with stimuli. Habituation, one type of non-associative learning, is a decrease in responding following repeated stimulation. Invertebrate models are often used for the examination of simple forms of

learning as reductionist models. Previous research on habituation in ants has focused on the habituation of aggression (e.g., mandible flaring, biting), whereas little research has examined the habituation of other types of responses (especially those that may require more exposures to habituate fully). The purpose of our research was to examine the habituation of locomotor activity on various substrates using an analog of the open field test (a test used in rodents in which animals can explore a chamber without experimenter interference). We hypothesized that ants would show a decrease in movement over time. Ants were maintained in three separate artificial nests consisting of a plastic container filled with gel (food) substrate and kept on a 12:12 light/dark cycle. Individual animals were removed from their nests and transferred to a plastic container containing either fine or coarse sand as a substrate, and their exploratory locomotor activity in the novel environment was continuously recorded for two hours. Each animal was run on fresh sand to avoid the potential confounding influences of pheromones during habituation. Locomotor behavior was later scored by superimposing a pair of lines over the video recording, intersecting at right angles and manually centered once on the middle of the container for each recording. A researcher counted the number of line-crossings during the first and last five minutes of the video. Preliminary data analysis suggests that animals showed a significant reduction in line-crossings when comparing the first five minutes and last five minutes of the video, suggesting a decrease in locomotor behavior over the course of the two-hour experiment. These findings highlight that (a) the open field test can be used to examine locomotor behavior in ants and (b) similar outcomes as have previously been measured in rodents regarding the habituation of motivated behavior can be measured in this invertebrate model.

The Role of Infant Locomotor Experience in Planning and Problem-Solving in a Whole-Body Object-Retrieval Task

Grace Feiner (Dr. Sabrina L. Thurman) Department of Psychology

On a near-daily basis, walking infants retrieve desired objects from their environments. This largely involves learning to control and coordinate their upper and lower limbs (e.g., hands, arms, legs), but also requires planning and problem-solving. Most research on how these skills develop has focused on experienced infant walkers, but we know little about early motor-cognitive coordination in new walkers. In the current study, we developed a whole-body object-retrieval task to examine how newly-walking infants coordinate their hands and bodies to problem-solve. We observed one pilot infant in 5 consecutive weekly sessions, beginning one month after walking onset (remaining data collection halted due to coronavirus pandemic). At each session, we assessed the infant's hand preference while seated using a reach-and-grasp task. Next, she completed an object-retrieval task, in which she retrieved objects from two different drawers of a custom-modified infant-sized storage box. For each of 8 object-retrieval trials, we coded how the infant used her hands and body strategically to open the drawer and retrieve the object (e.g., hand and body location in relation to the storage box, and specific hand and posture usage when opening the drawer and retrieving the object). The infant exhibited a more stable hand preference during both tasks over time, and did not frequently use her secondary hand for postural support during object retrieval. When retrieving the object from the lower drawer, the infant required more attempts and postural adjustments to successfully retrieve the object compared to the upper drawer. The infant adopted various inappropriate postures for the lower drawer before successful retrievals (e.g., sitting and blocking the drawer with her body), but consistently stood while retrieving the object in upper-drawer trials. Studying learning in action could clarify overlaps between motor and cognitive development by demonstrating how newly-walking infants adjust their motor behaviors concurrently with problem-solving strategies to achieve their goals. This could inform how

infants learn to engage in strategy inhibition and selection, and distinguish between adverse actions and those that are conducive to the solution.

Knowledge of Autism Spectrum Disorder Among Speech-Language Pathologists, Parents, and College Students*

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Early identification and treatment of children with autism spectrum disorder (ASD) is associated with more positive developmental outcomes (Becerra-Culqui et al., 2018). Due to its prevalence rate of 1.5% (Zwaigenbaum et al., 2015), an understanding of autism is essential for speech-language pathologists (SLPs) who help patients develop effective communication and social skills, as well as parents and other practitioners who can identify early symptoms and refer children for diagnoses. The current study investigated the knowledge about autism held by speech-language pathologists (n=58), parents of young children (n=62), and college students (n=135). SLPs were primarily recruited via professional Facebook pages and parents were primarily recruited using neighborhood Facebook pages. Students were included in the study to provide information for undergraduate educators and were recruited from introductory-level psychology classes. SLPs completed the Autism Spectrum Knowledge Scale Professional Version-Revised (ASKSP-R, McClain et al., 2019a) and the parents and college students completed the Autism Spectrum Knowledge Scale-General Population (ASKS-G, McClain et al., 2019b). These scales tap knowledge about etiology & prevalence of ASD, assessment & diagnosis, symptoms & co-occurring disorders, and outcomes & prognosis. Additional questions specific to language development and open-ended questions about causes, cures, and misconceptions about ASD were added to the surveys. The results show that on the modified ASKSP-R, SLPs are most knowledgeable regarding outcomes & prognosis (76% correct) and the least knowledgeable about symptoms & co-occurring disorders (37% correct). Results from the modified ASKS-G show that both students and parents are most knowledgeable about the symptoms & co-occurring disorders (71% correct). Students were least knowledgeable about assessment & treatment (38% correct) and parents were least knowledgeable about etiology & prevalence (46% correct). SLPs were most knowledgeable and parents and students were somewhat knowledgeable about risk factors and causes associated with ASD, with many indicating that biological factors (e.g., genetics), prenatal development, and some environmental factors are involved. Very few mentioned vaccines as a possible cause (<1%) and most participants correctly indicated there is not a cure (89%) for autism. The implications of these findings for professional development of SLPs and educational campaigns for the general public will be explored.

Examining Stock Harness Habituation in Harvester Ants

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Habituation is a form of learning that results in reduced responsiveness to a stimulus following repeated exposure to that stimulus. In ants, habituation effects have been measured mostly in the context of aggressive responses; less is known about habituation of other commonly expressed behaviors in ants. Because habituation is one of the most universal forms of learning, for our research we hypothesized that habituation would occur in both aggressive and escape-related behaviors. We used a novel harnessing methodology in which individual animals were placed in modified index cards, securing the head in a fixed location while allowing the posterior portions of the body (thorax

and abdomen) to be suspended above the ground. This permitted unrestricted movement of the anterior and posterior body while also maintaining the animal in a fixed location. We measured the expression of aggressive (gaster flexion) and escape (leg flailing) responses in individual animals (N = 22) by observing the movement of the body and characterizing the presence (Y) or absence (N) of the response during a brief observation window. Animals were left undisturbed for 12 minutes while their behavior was video recorded, following which they underwent a dishabituation trial (tactile stimulation of the head cuticle), which is normally included in habituation experiments to confirm that decreases in behavior do not reflect fatigue. The presence or absence of responses (leg flailing, and/or gaster flexion) was hand-scored once every 20 seconds for a total of 36 observations per animal. Our results indicated no evidence for habituation of any of the behavioral responses measured, owing to the sustained expression of both behaviors when comparing the first and final 2 minutes of observation (gaster flexion $t(21) = 0.30$, $p > 0.76$; leg flailing $t(21) = 0.10$, $p > 0.92$) . It is possible that the survival benefits associated with the expression of these responses sustains performance over several minutes; therefore, a longer habituation period may be necessary to measure habituation using a stock harness method.

Exploring Depression as a Learning Deficit

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Psychological and somatic symptoms are often used to diagnose depression, including hopelessness, problems sleeping, lack of interest, difficulty moving, and loss of appetite (American Psychiatric Association, 2013). However, there are also neurological disturbances associated with depressive disorders that influence learning and memory processes and can thus have an expanded cognitive effect on the function of an individual beyond that described in this list of symptoms. For example, the dopaminergic system, which is altered in depressed patients, is also responsible for reward learning, which generalizes across many patient experiences. The purpose of this research was to examine changes in associative learning (e.g., reward learning), non-associative learning (e.g., habituation), and brain activity (e.g., fMRI) in individuals diagnosed with depressive disorders. We reviewed a brief portion of the literature consisting of empirical articles sourced through various databases. After conducting a targeted literature search primarily focusing on studies that included measurements of brain activity, associative learning, and/or non-associative learning paradigms in depressed patients (e.g., major depressive disorder, postpartum depression), I reviewed a total of 12 articles on this (and closely related subjects, such as post-traumatic stress disorder, the GABAergic system, and the serotonergic system) published between 1999 and 2020. Individuals with depressive disorders showed differences (both increases and decreases) in brain activity, which was measured across the dopaminergic system (including the striatum and ventral tegmental area), superior temporal gyrus, and the autonomic nervous system (measured through the skin conductance response). Depressed patients also showed impaired performance in eyeblink conditioning, habituation, and sensitization, although there was variation in outcomes across studies. These findings suggest that the deficits associated with depression extend beyond affective outcomes and into cognition which can further disrupt performance in academic and professional settings, as well as compromise the success of interpersonal relationships. Collectively, these studies suggest that depression may be associated with changes in the nervous system that influence multiple forms of learning, highlighting novel avenues for the diagnosis and treatment of depression by targeting the dopaminergic system and reward pathways in the brain.

Mission Accomplished: How Framing of Organizational Mission Statements Impacts Public Opinion

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Previous literature supports the idea that meaningful mission statements are effective as a managerial strategy. This is especially true in nonprofits, which are more firmly based in their missions due to the nature of their organizational structure. A mission statement also serves as a tool for communicating with people outside of the organization about its goals and values. Because nonprofits rely heavily on public support to succeed, it is important for a mission statement to maximize positive feelings about the organization itself and the cause it supports, but research on this has been limited. One way to manipulate feelings about a particular cause or idea is by altering the framing, or the underlying association that comes with certain words and phrases. This research looked specifically at attitudinal position framing, a form of framing that describes a stance on a cause as either "for" something or "against" the opposite; the opinion itself is exactly the same, but it is framed in either a positive or negative way (i.e. pro-Democrat vs. anti-Republican). The goal was to examine whether attitudinal position framing influences attitudes and behavioral intentions (i.e. donating or volunteering) in the context of four different types of nonprofits – animal welfare, environmental protection, humanitarian aid, and reproductive justice. A sample of 290 compensated Amazon Mechanical Turk workers participated in an online, 2x4 between-subjects experimental study. Each participant read one mission statement and answered six related questions, such as how much they identified or agreed with the mission statement and how likely they would be to donate to the organization. There was a significant effect of organization type, but no overall effect for the "for" or "against" framing. These findings pose interesting questions about context and study design, such that attitudinal framing impact may not be as salient when embedded in the mission statement context or when the framing cannot be directly compared.

Graph Theoretical Analysis of the Default Mode Network in Adults with Mild Cognitive Impairment and Alzheimer's Disease: An fMRI Project

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The default mode network (DMN) is a network of functionally-connected brain regions that are active during "resting states" when an individual is not engaged in any cognitive task. Changes in DMN activity have been linked to memory decline in individuals with Mild Cognitive Impairment (MCI) and Alzheimer's Disease (AD). However, it is still unknown exactly how AD preferentially targets regions of the DMN. Most brain-imaging research in the past has focused on univariate analyses in which individual brain regions are examined, rather than relationships between brain regions. More robust multivariate analyses and larger sample sizes are needed to understand patterns of brain activity. Additionally, few studies have examined both structural and functional data from the same individuals. This study addresses this gap by conducting large-scale multivariate analyses of both structural and functional brain scans from the same individuals. The analyses use graph theory, which examines relationships between brain regions by representing them mathematically as a network of nodes and edges. Structural and functional neuroimaging data were obtained from the OASIS-3 dataset (LaMontagne et al., 2019) and include scans from 102 healthy controls and 102 MCI and AD patients. Based on previous research, 87 structural gray matter regions of interest were defined for the structural network analysis and spherical regions of interest (ROIs) were defined for the functional analysis. Graph theoretical analysis was conducted using the Brain Connectivity Toolbox (BCT) (Rubinov &

Sporns, 2010) in MATLAB. For the large network structural analysis, graph measures were similar to those found by John et al. (2017); however, some differences were seen at the sub-network scale. Specifically, Cluster 2 showed changes that suggest a decrease in network efficiency. This suggests that some functional clusters are more susceptible to the effects of AD. Functional analysis is pending, and may reveal statistical differences in connectivity between healthy and impaired networks that could be potential biomarkers for AD diagnosis. The large sample size and incorporation of both structural and functional data allow this study to uniquely demonstrate how brain connectivity is targeted by abnormal aging processes.

Alibi Corroborators: Relationship with Defendant, Certainty, and Cooperativeness

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Alibis are judged by law enforcement officers, jurors, and judges. Alibi believability can be affected by several factors, including characteristics of the person who corroborates the alibi (Culhane & Hosch, 2004; Olson & Wells, 2004). We are examining three independent variables. First, we will look at the impact of the relationship between the defendant and his corroborator on juror perceptions of the alibi and defendant. The defendant's corroborator will be his brother or his neighbor. Several past studies have shown that defendants whose corroborators are more distant are more believable than when the corroborators are close family members (e.g., Culhane & Hosch, 2004; Eastwood et al., 2020; Fawcett, 2016; Hosch et al., 2011). For our second independent variable, we will manipulate the corroborator's certainty that the two were together on the night in question (65% versus 100% certain). Past studies have confirmed that corroborator certainty can affect juror views of the defendant, with more certain corroborators leading to more positive defendant views (e.g., Allison et al., 2014; Culhane & Hosch, 2004; Fawcett, 2016). For the third independent variable, we are manipulating the degree of cooperativeness with which the corroborator interacts with the police. In one condition, he was uncooperative and did not return police calls, while in the other condition he was cooperative and did return police calls. Corroborator cooperativeness has not been studied in this context, but other research has shown that some community members distrust police interactions (e.g., Cavanagh et al., 2019; Ferdika et al., 2013; Tyler et al., 2015). Further, no one has examined the corroborator relationship, certainty, and cooperativeness together in one study. In this study, we will ask U.S. participants recruited from Amazon's TurkPrime (N = 300) to evaluate a mock legal case in which an arson at a commercial building occurred. We hypothesize that alibi believability will be higher when the corroborator is a neighbor rather than brother, when he is 100% certain they were together, and when he is cooperative when talking to the police. Data collection is starting this month and we expect to have all the data collected before SURF.

Sexual Assault Resource Knowledge and Utilization by Elon University Students

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It was not until the early 1970's that there was a law to prohibit sexual discrimination in educational institutions and individuals started coming together in an anti-rape movement. Yet, most campuses did not have rape crisis centers until the early 1990s (Jessup-Anger et al., 2018). In only the past three decades, undergraduate institutions have made great progress in sexual assault prevention and resources, yet rates of sexual assault have not declined. This continued trend is demonstrated in the 2019 AAU campus climate survey, wherein 13% of all undergraduates experience nonconsensual sexual contact (NCSC) and undergraduate women experience it at a rate of 25% (Cantor et al., 2019).

The continued presence of NCSC on college campuses highlights the importance of accessible resources to help students prevent, process, and help others with such experiences. The goal of our research project is to assess Elon students' awareness of sexual assault resources in order to improve the Violence Response Team at Elon University. The main question here is, what do students currently know about resources and what are the most effective ways for students to learn about such resources? Participants will be recruited through various media platforms and email. Students interested will then be sent a follow up email that includes a screening survey that explores past use of resources and further information on the research goals and focus groups. Participants will then be split into three groups based on the usage and knowledge of such resources. They will be offered $10 gift cards for their completion of our focus groups. Focus groups will be held the weeks of March 8th and 15th and be held via zoom where students may de-identify themselves. Participants will be asked to discuss a variety of questions regarding their use of resources and data will be transcribed and analyzed via the audio recordings while keeping the participants' identities confidential. In analyzing the data we hope to determine where students receive their information and what resources they are most aware of in order to improve the process of handling such experiences with sexual assault.

The Role of Education and Contact in Predicting Transprejudice*

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The current study investigates attitudes towards transgender youth, along with their relationships with past contact and education about gender and sexuality topics. Based on intergroup contact theory, we believe positive contact with transgender individuals will be associated with lower levels of prejudice. We also anticipate that gender and sexuality education will be associated with more positive attitudes via implicit theories about gender. Specifically, essentialist beliefs about the nature of gender (which define it as biological, inalterable, and binary) and environmental views of gender nonconformity (beliefs that transgender identities develop because of social factors) may be challenged through education. However, because education about gender and sexuality necessarily involves developing a more complex understanding of the nature of the two constructs, individuals who are high in need for closure (a trait characterized by an aversion to ambiguity and dislike for cognitive complexity) may not show the same relationship between education and attitudes as those who are comfortable with ambiguity and complex ideas. To test these hypotheses, cisgender participants will complete an online survey in which they evaluate a trans youth described in a short vignette. We will also measure self-reported past contact with trans people, education on gender and sexuality topics, need for closure, environmental views of gender nonconformity, and essentialist beliefs about gender. We expect that essentialist beliefs and environmental views of gender nonconformity will mediate the relationship between education and attitudes, but not the relationship between contact and attitudes. We also hypothesize that need for closure will moderate the relationship between education and attitudes; we predict the relationship between education and attitudes will be present for participants who are low - but not high - in need for closure. Support for our hypotheses would indicate that programs that educate people about the complexity of gender, sex, and sexuality can meaningfully contribute to broader diversity and inclusion work. Additionally, this would highlight the complementary roles that education and exposure may have in helping to resist and reduce transphobia, as well as heteronormative and cisnormative expectations for children.

Shutting Down During Shutdown? Predictors of Depression and Anxiety in Working Adults during the Early COVID-19 Pandemic

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COVID-19 pandemic conditions have created an unprecedented set of stressors for the mental health of people in the United States and across the globe (Cowan, 2020). Several aspects of the pandemic create risks for mental health being negatively impacted, including health concerns, quarantine/social isolation, and financial concerns (Brooks et al., 2020). The current study contributes to the emergent research on COVID-19 through the collection and analysis of data examining how conditions of the pandemic have impacted the mental health of working and partnered adults. Specifically, this population was examined based on evidence of significant strain resulting from working-at-home for both family relationships as well as significant relationship distress for couples (Craig & Churchill, 2020). The sample included 623 individuals that reported being employed part-time or full-time and who reported living at home with a romantic partner. Participants were 84.5% female and 14% male, and 90.5% Caucasian, 1.1% Black, 2.1% Asian, 1.3% Latino. Two hierarchical regressions were performed to examine how employment/financial concerns, work conditions, relationship issues, health concerns, and demographic factors were related to depression and anxiety. Results suggest that anxiety symptoms were related to worry about income loss, lack of a dedicated home workspace, financial strain in relationships, lower frequency of sexual intimacy, younger age, and female gender. Depression symptoms were associated with lack of a dedicated home workspace, financial strain in relationships, negative feedback from an employer about work performance, lower ability to be authentic at work, lower frequency of sexual intimacy, lower relationship satisfaction, female gender, lower level of education, and no children residing in the home. Limitations of this study include the use of convenience sampling resulting in minimal racial and income diversity. The results suggest that the pandemic has negatively affected mental health, reinforcing the need for support to maintain a positive mental health state. Based on this research, clinicians should monitor work problems, financial relationship stress, and sexual activity as potential risk factors for mental health concerns during the pandemic. Individuals might focus on flexibility in the workplace, maintaining a routine, and setting boundaries between the home and office to manage their mental health.

Characterization of Ant Sensory Systems and Features Influencing Locomotor Activity

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Ants possess sophisticated olfactory and visual sensory systems. In this targeted review of the literature, we describe both the organization of these sensory systems and the features of locomotor activity in ants. Such descriptions allow researchers to identify (1) brain regions involved in learning about environmental stimuli, (2) where convergence occurs between sensory systems, and (3) possible connections between sensory perception and movement. We conducted our review using a two-step process, beginning with a cornerstone review on the ant nervous system (Gronenberg, 2008) combined with additional select articles to identify gaps in the literature and to source additional research studies examining the visual and olfactory sensory systems. This was later integrated with a targeted review on the influence of environmental factors on locomotor behavior. We found that ant locomotion is examined in both individual and group settings, and appears to be influenced by environmental features, such as olfactory (social) and tactile (substrate) cues. Moreover, we found that an ant's olfactory perception begins at the level of the antenna where sensory neurons project to the antennal lobe. After processing in the antennal lobe, sensory information is relayed to a brain region called the

mushroom bodies. The visual system is similar: photoreceptors in the eyes project to the primary visual regions of the ant brain (the optic lobes), which then project to the mushroom bodies. This led us to conclude, consistent with past research, that the mushroom bodies may be an important site for associations between olfactory and visual cues in the environment. The use of visual and olfactory stimuli for navigation suggests a close interaction between the association functions of the mushroom bodies and motor control divisions of the nervous system. Relatively little is known about the specific biochemical mechanisms and neurotransmitters involved in these sensory systems. Other outstanding areas of future research include examining the role of experience and sex-based differences in learning. Collectively, research on the neural mechanisms of sensation and behavior in ants helps us understand organizational features of the brain common to both invertebrates and vertebrates, enhancing their utility as a reductionist animal model.

Teaching for Social Justice: An Oral History*

Caitlin R. Strickland (Dr. Katie King) Department of Psychology

As an aspiring educator, I am very aware of the influence that teachers can have on their students' lives. Teachers can either work against racist practices and promote success for all students or they can, often unconsciously, work to support inequality in education. For my inquiry project, I interviewed educators working in different fields and settings to learn how their own experiences have influenced their approach to race-based social justice in their classrooms. As a teaching fellow and a history major, I have drawn on the academic disciplines of both history and education in my research, using the qualitative method of oral history to collect and analyze my data. Oral history draws on the memories and lives of individuals to provide information about significant events and movements and can provide historical context for understanding current events (Eick, 2011). Through my own social contacts, I recruited and interviewed seven educators located across the country. The findings here are based on three interviews: those of Ganae McAlpin, a Black female high school history teacher; Jim Bissett, a white male college history professor (now retired); and Sachin Jhunjhunwala, an Indian-American male high school math teacher. Each educator described how they came to understand the pivotal role that social justice and injustice play in the realm of education. Raised by a member of the Black Panther Party in Chicago, Ms. McAlpin grew up aware of racial inequality and the need to actively work against it. In contrast, Dr. Bissett was taught white supremacy in his segregated Southern home town and church, but came to a new realization and to understand the myth of American exceptionalism in his early college years. Mr. Jhunjhunwala described how he benefited from his 'model minority' upbringing but started to realize how this made him complicit in white supremacy when he changed careers in mid-life. All interviewees make profound statements in their explanations of how they have made teaching for social justice and racial equality central to their work.

Faculty Memorable Moments with Students in Service-Learning

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Research has established that service-learning is a high-impact practice with significant consequences for student learning (Bringle, 2017). As a result, service-learning courses have been widely implemented by colleges and universities nationwide, often as an element of broader experiential learning initiatives. Since the engagement of faculty in the community has historically been very undervalued, more research can provide both understanding of and recognition for the value faculty bring to the service-learning experience (O'Meara, 2008). Examining faculty motivation for service-

learning will help illuminate the most effective methods for encouraging faculty to establish and maintain a commitment to service-learning (Banerjee & Hausafus, 2007). To support faculty who participate in high-impact practices like teaching service-learning courses, it is necessary to identify the memorable experiences faculty have with students that motivate them to continue engaging in this work. Eliciting faculty members' most memorable moments in teaching S-L will help institutions more effectively support these teaching endeavors and foster more of these motivating moments. Twenty-two faculty from a medium-size liberal arts institution participated in a 24-minute interview in which they were asked to recall a memorable service-learning experience with a student. An inductive analysis of transcripts was conducted where codes, categories, and themes were identified. The study found that faculty members' experiences highlighted themes of students forming a connection with the community partner, students getting out of their comfort zone, students jumping right in, and students caring about the work. This research provides a foundation for understanding what inspires and motivates faculty to continue teaching service-learning courses. Understanding faculty motives and memorable experiences can help guide colleges and universities to most effectively support and sustain faculty members' commitment to service-learning.

Public Health Studies

Transferring Knowledge into Action: Examining the Impact of a Rural-Indian Adolescent Girls Intervention at the Individual, Family, and Community Level*

Griffin P. Barriss (Prof. Amanda Tapler) Department of Public Health Studies

The Comprehensive Rural Health Project (CRHP) in Jamkhed, India, uses the evidence-based "Jamkhed Model" to improve public health with existing community resources and interventions adapted to community values. A component of CRHP is the Adolescent Girls Programs (AGPs), which teach girls valuable lessons on the importance of education, women's health, and gender equality. AGPs aim to improve girls' quality of life, community participation, and sustainable community development. Resource restraints inhibited CRHP from researching AGPs' long-term impacts, and gaps in the academic literature exist on AGP graduates' community impacts globally. This collaborative project investigates how knowledge gained through AGPs impacts the lives of the graduates, families, and communities. Rooted in Community-Based Participatory Research, this study engaged community members as research partners to mitigate power dynamics and collaboratively identify important community issues. Twenty-five semi-structured interviews were conducted with AGP graduates aged 23-33, identified by convenience sampling, living in four CRHP-project villages, eight non CRHP-project villages, and three large cities. Prior to data collection, the Elon-CRHP Research Team hosted focus groups and piloted interviews to ensure effective phrasing of questions. Interviews were conducted, transcribed, translated into English by CRHP researchers and sent to Elon University for coding. Findings revealed AGP graduates' knowledge retention and application at individual, family, and community levels. Graduates demonstrated strong agency, as 100% indicated "some involvement" in household decision-making and 57.7% indicated greater than 75% involvement in household decisions. Graduates used AGP lessons to reject dowry, pursue higher education, or start small businesses. Graduates expressed intentions to raise their children better than their mothers, with gender equality, and independence. 65.4% of graduates encouraged their children to finish school, and 100% planned to enroll them in AGPs. Graduates shared AGP lessons and values with family and community members to improve health status. More than half (54%) joined Women's Self-Help Groups (SHGs), some in leadership roles, and some started SHGs in their new communities. Findings show that AGP Graduates are engaged community members and social entrepreneurs, providing

evidence of the Jamkhed Model diffusing into rural Indian communities formally and informally and with long-term sustainable development success.

Examining the Relationship Between Neighborhood and Self-Reported Health

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Following the implementation of the Affordable Care Act, a majority of research regarding individual health has mostly focused on the effects of health insurance coverage or other financial barriers. Further analysis has highlighted gaps in research regarding the impact of structural and social determinants on health (Sommers et al., 2017). This study aims to contribute to the growing body of literature supporting the role of social, behavioral and economic factors on health outcomes. Given neighborhood context is directly associated with access to food, safety, education, and health behaviors it is to be expected that disadvantaged communities would experience a lower self-reported general health status (Kind & Buckingham, 2018). To examine the effects of neighborhood environment on health status, this study utilized the Behavioral Risk Factor Surveillance System, BRFSS and a composite measure of neighborhood advantage called the Area Deprivation Index (ADI). The ADI ranks neighborhood advantage on both the national and state levels, using education, employment, housing-quality, and poverty indices. Self-reported health was recorded on a scale of 1-9; with 1 corresponding to excellent health and 5 corresponding to poor health. The values 7 and 9 correspond to the participant's uncertainty or refusal to answer. North Carolina experiences poor community and individual health outcomes due to socio-political factors at the state and local level that disproportionately affect different neighborhoods, because of this counties within North Carolina were selected for the study. Analyses are currently underway which will examine the trend between one's environment and their health status; we hypothesize that there is a positive and direct relationship between neighborhood advantage and individual health. To test this hypothesis, correlation and regression analysis will be conducted. The results will contribute to the growing understanding of lesser studied social and environmental factors that contribute to health disparities. Understanding the link between neighborhood surroundings and its effects on individual and community well-being is necessary as it may provide a more holistic understanding of the gaps in care and foster more effective and meaningful health interventions. This study provides a framework for future research at the regional or national level.

South Asian, College-Aged Women and the Influence of Religion and Cultural Factors on Sexual Decision Making*

Srija Dutta (Prof. Amanda Tapler) Department of Public Health Studies

This study analyzes the role that religion and cultural factors play in shaping sexual knowledge, attitudes, behaviors, and autonomy of college-aged, South Asian women. It's well documented that religious factors can shape the development of sexual identity and decision-making among adolescents. Current research on South Asian students doesn't include the diasporas of South Asian women, nor consider ways in which their sexual identities have been shaped throughout their lives. This research provides an opportunity for South Asian women to explore factors associated with sexual development and autonomy. Sixteen South Asian women, enrolled in undergraduate institutions, participated in semi-structured interviews and focus groups. Potential participants were identified by peer and colleague connections, as well as the "snowball technique." Due to COVID-19, interviews and focus groups were conducted via Zoom. Religious belief and affiliation were explored in relation

to sexual attitudes, behaviors, and sexual-decision making. Focus groups were used to gain a deeper, more comprehensive understanding of the themes and discrepancies unveiled by the interviews. These groups allowed participants to delineate the religious and cultural implications of their sexual decisions and engage with women who have had similar experiences. Findings indicate parental influence, degree of religious autonomy, and college culture play a significant role in sexual attitudes and decision-making of young South Asian women who participated in this study. 81% of participants reported growing up with parents who restricted their sexual expression. 85% indicated that college provided an opportunity to learn more about human sexuality. Additionally, participants who had strong religious beliefs and who experienced religious stereotyping were more likely to articulate a lack of sexual autonomy. 73.3% of participants believed their college experiences positively influenced their sense of sexual autonomy.

The Utility of a Community Advisory Board for Undergraduate Research*

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Community Advisory Boards can be a useful tool in community-based participatory research involving community members and ensuring research ethics. For this project, a Community Advisory Board (CAB) was assembled and includes seven members with different roles in the Latinx community, including healthcare workers, medical interpreters, community activists, and community leaders in issues of race and language. Four of the seven members are Spanish speakers, and three are immigrants to the United States. Community Advisory Board members should represent the community participating in the research study. The process of creating a CAB is a critical part of the overall research project. Since establishing the community advisory board, the researchers have met with the CAB monthly to discuss multiple aspects of the research study. Community Advisory Boards assist researchers by providing insights about community needs for understanding the research topic in practical ways, providing advice about the efficacy of the informed consent process, and providing support during implementation of research protocols. To support this research project, the CAB has provided feedback on research procedures, on-going advice on the process of recruiting subjects for the interview process and focus groups, incentives for participants, ways to disseminate information carefully and effectively, and avenues to further the research. The Community Advisory Board assisted with terminology to ensure it is correct and culturally respectful such as using “Latino” instead of “Latinx” on all community documents and focus group guides. The CAB additionally guided the researcher on identifying a topic of interest for the community, and helping the researcher refine the focus of the research study. The lived realities of reproductive health, for the Latinx community in Alamance County, will be investigated. Thus far, the establishment of the Community Advisory Board has proven beneficial in creating effective community-based participatory research strategies. The CAB has been instrumental in ensuring research ethics and culturally appropriate materials. Community Advisory Boards could be useful for local undergraduate researchers and future research projects.

Access to Mental Health Care in the Montagnard Migrant Community: Examining Perspectives across Generations in North Carolina*

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The Montagnards are a diverse group of indigenous tribes from the Central Highlands of Vietnam. Now resettled in the United States, Montagnard migrant communities face unique mental health challenges, stemming from decades of trauma and ill health prior to their resettlement from Vietnam. Research has demonstrated that health challenges facing migrant communities are often compounded by sociocultural, political, and economic factors associated with resettlement, and by a lack of access to health care. There is little published research, however, about Montagnard migrants, who have been characterized as hard-to-reach and under-served. In this qualitative research study, framework analysis was used to assess mental health care access within and across multiple generations of Montagnards in North Carolina. Twenty-six semi-structured interviews were conducted to gain insights into the perspectives of Montagnard migrants on mental health and access to mental health care. Interviews were transcribed and analyzed using the qualitative analysis software, Dedoose. The results indicate that there is a lack of understanding of, and a stigma that surrounds, mental health by Montagnard communities. Additionally, Montagnard migrants value strength and reputation and thus, tend not to discuss the topic of mental illness. One participant summarized it as, "I don't think many of our community members would take mental health seriously and seek further help... we tend to keep it to ourselves... we think everybody needs to be mentally strong and stable. It's your own problem... We also consider it, like, shame and pride, really high in our community. So you don't want other people to look down on you." These factors lead to limited access to mental health care along with cost, communication, and language barriers. Older members of the Montagnard migrant communities seem to be disproportionately affected by these access-related factors, though younger Montagnards showed more symptoms of mental illness.

Understanding Hospital Level Factors and Severe Maternal Morbidity and Mortality: An Integrative Literature Review*

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Women of color in the United States have an increased risk of maternal mortality and severe maternal morbidity as well as other adverse medical outcomes. Among these populations, Black women are three to four times more likely to die from pregnancy-related deaths as compared to white women (Howell & Zeitlin, 2017). The majority of maternal deaths and severe maternal morbidity events are preventable. Research suggests that racial disparities in maternal morbidity and maternal mortality are greatly influenced by a variety of determinants, including hospital level factors. Some examples of hospital level factors include percent non-White patients, percent Medicaid/Medicare beneficiaries, and annual volume of delivery. For this review search terms included but were not limited to a combination of the following: Severe Maternal Morbidity and Maternal Mortality, Hospital level factors and SMM and Racial Disparities. These terms were used across various public health databases, including Pubmed, ProQuest, and ScienceDirect. Preliminary results of this review indicate that there are consistent limitations to this research, including barriers related to identifying the different mechanisms that hospital quality contributes to disparities in maternal health outcomes. There is also a lack of clarity within the field on how to develop the appropriate solutions which could improve hospital quality for historically oppressed populations as well as hospital quality overall, and thus improve maternal health outcomes for all birthing persons. The objective of this literature review is to (1) identify the available evidence on the influence of hospital level factors on racial inequities in maternal mortality/severe maternal morbidity (2) identify solutions provided in the literature regarding quality level hospital care. The findings from this review will help to inform future research on Hospital factors and racial disparities in maternal health. We aim to disseminate findings at the Annual Public Health Association conference and to the Health Equity and Racism Lab at Elon University.

Religious Studies

Bollywood and its Indian-American Audiences

Annabelle Baker (Dr. Brian Pennington) Department of Religious Studies

My research examines the role Bollywood plays in cultivating cultural connection to the homeland within the Indian diaspora, specifically the diaspora in the USA. There are few scholarly studies on this aspect of Bollywood, which is a signifier for Hindi-language movies produced in India. My presentation draws on the more than 80 responses that I received to the survey that I developed and disseminated on multiple Indian-American social media platforms and Bollywood fan-sites. The survey included questions about Bollywood's relationship to culture, religion, and identity, and asked respondents to name specific examples of films that do and do not represent Indian culture well. My findings reveal that Indian film-watchers in the USA participate in various kinds of social and cultural relationships with Bollywood film, and there is no strong consensus on whether Bollywood films are an accurate representation of Indian culture. Many of my respondents answered that Bollywood films are influential in continuing to provide a cultural connection with their homeland (and with other Indian-Americans), but others said that they find Bollywood films alienating and an unrelatable representation of Indian culture. When asked to name specific examples of movies that accurately represent Indian culture, more than 50% of respondents identified at least one movie centered on diasporic Indian stories. The majority of responses claimed that these movies were accurate depictions of Indian culture because of the familial relations portrayed in them, primarily between children and parents, but also between husbands and wives. Other responses identified the very same movies as poor representations of Indian culture, but supplied different reasons. Numerous respondents critiqued the patriarchal themes present in Bollywood films, and named instances in which they appreciated subversions of that patriarchy. Most of them indicated that they do not consider Bollywood films as relevant to religious experience, but many mentioned religious stereotypes found in Bollywood films, especially towards Islam. The dichotomies and contradictions in these survey responses shed new light on the culturally reciprocal relationship between the Indian-American diaspora and Bollywood film.

Cambodian American Religion in the United States*

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This study examines the current status of Cambodian religion in the United States as practiced by migrants and their descendants living in the American diaspora. The first substantial Cambodian communities in America formed in the late 1970s as waves of refugees fled the Khmer Rouge regime and the notorious Pol Pot. Early efforts to establish religion (typically Theravada Buddhism) in this unfamiliar context were met with significant challenges, chiefly the severe dearth of monastic leadership, who had been systematically eliminated in Pol Pot's attempt to eradicate religion in Cambodia. Today, however, we see a variety of thriving Cambodian American religious communities from Long Beach, CA to Richmond, VA. In communities such as these, the process of cultural preservation eventually ignited and took off (Chan, 2003). Robust heritage programs have developed in larger communities, which not only reaffirm ethnic identity but also encourage linguistic and cultural competency (Um, 2020). This paper sheds light on the complex religious landscapes that exist today as a result of the efforts to rebuild and preserve Khmer heritage, especially among the younger Cambodian American generation. Survey instruments and socially-distanced interviews were employed to reach people who identify as Cambodian or ethnically Khmer from across the country.

These tools were designed to address questions of identity, religious belief and practice, temple community, Cambodian American culture, and the persistence of Cambodian folk ritual in the US. Survey results show Khmer Americans have significantly transformed the religious ideas of their parents and grandparents in ways that challenge existing scholarship about this community. Trends potentially indicate a larger cultural change surrounding Khmer religious ideas: the emergence of a new religious landscape characterized by Cambodians who increasingly identify as Christian or not-religious and an orientation towards religious belief and practice that has shifted towards the exclusivity more typical of the US religious landscape. Findings provide insights into the specific beliefs, practices, ideas, and religiosity of today's Cambodian Americans, illustrating the homogenization taking place in the US context and the growing number of religious "nones" among Cambodian-Americans.

Sex and Sex Acts: Reading the Erotic Frescoes and Graffiti in the Purpose-Built Brothel and Suburban Baths of Pompeii

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The erotic frescoes in the purpose-built brothel and the Suburban baths of Pompeii show a variety of sex acts. The images in the brothel depict mainly normative sex acts between men and women, which Sarah Levin-Richardson has argued, offered clients a variety of "normal" or "straight" sex acts to help facilitate their desire. The Suburban baths, on the other hand, include frescoes of non-normative sex acts, as defined by ancient Roman standards, such as women-women sex and threesomes. John Clake argues that these frescoes of non-normative sex offered a distraction as a way to encourage viewers to look at them and to keep them from envying each other's bodies. For Clarke, non-normative sex must be a form of satire and the "humorous" images provided a way for the bath-goers to look (and laugh) at the bodies shown on the frescoes, rather than looking at each other. For both Clarke and Levin-Richardson only "normal" men and women mattered to the interpretation of these sex scenes. In fact, most modern scholars have divided Ancient Romans into only two categories: the "active" and "passive," the norm being that free adult men are always "active" and penetrating and women are always "passive" and penetrated (Kamen & Levin-Richardson, 2015). But "non-normative" sex was practiced (and pictured) in Ancient Rome and while often marginalized, people who practiced this non-normative sex did exist. These types of people vary. For example, Amy Richlin discusses the cinaedus, a man who likes to be sexually penetrated by other men, while Levin-Richardson and Deborah Kamen discuss the fututrices, a woman "who fucks" or is considered active in sex. In this paper, I will offer a reading of the images in the brothel and Suburban baths that centers "non-normative" perspectives. Using queer theory as a method to challenge the normative interpretations of these images, I will also be investigating graffiti in parallel with the frescoes, as a way to show the non-normative or marginalized groups' attitudes towards sex and sex acts.

The Promotion of Sufism as a Counter-Extremism Strategy in the Moroccan Press

Kaitlin V. Theall (Dr. Ariela Marcus-Sells) Department of Religious Studies

Despite a contentious history between the Moroccan state and Sufism, the state has promoted Sufism in recent counter-terrorism efforts. One of the main sites of this promotion is in the state-controlled Moroccan press, which disseminates a specific interpretation of Sufism rooted in Orientalist thought. My research investigates the state-controlled press in Arabic and French and demonstrates how the press portrays Sufism as an individual, spiritual path, as well as a foundational element of Moroccan

culture as part of their counterterrorism efforts following the 9/11 attacks on the United States and the 2003 bombings in Casablanca. My thesis argues that this portrayal is limited in scope by this Orientalist thought, and is portraying Sufism in a highly apolitical sense, which deviates from the actual history of Sufism in Morocco. By limiting Sufism to this portrayal, the state is ignoring the highly political history of Sufism in Morocco. Moreover, Sufi groups opposed to this state portrayal of their tradition have recognized the inaccuracies of this portrayal and denounce the government's presentation of Sufism as an individual spiritual path, due to a depoliticization of the tradition and a minimization of diversity in thought among Sufis.

Acceptance, Empowerment, and Change: The Experiences of LGBTQ Jewish Women at Camp Ramah and Beyond*

Liora E. Wittle (Dr. Geoffrey Claussen) Department of Religious Studies

Women and LGBTQ individuals have historically been marginalized in Jewish communities, but they have often found acceptance and empowerment within Jewish communities in the contemporary United States. The overlap between being Jewish, LGBTQ, and a woman has not been well studied, and the nuances of the intersection of these identities has often been overlooked. Focusing on these intersections, my research examines a group of LGBTQ+ Jewish women linked to one Jewish summer camping network, focusing on how they experienced inclusion or exclusion and empowerment or disempowerment. I interviewed eleven LGBTQ+ women between the ages of 18 and 20 who attended Ramah summer camps, which are affiliated with the Conservative Movement, focusing on their experiences with community. Those that I interviewed all had communities they felt fully accepted in, and all felt that Judaism was compatible with their sexuality or gender identity. However, my research found that participants did face discrimination at Ramah and in the wider Jewish community. At Ramah, they experienced some discomfort from their peers about their sexuality, and in the wider Jewish community their sexuality was not acknowledged. Particularly in Orthodox spaces, they also faced discrimination because of their gender. Despite these experiences of discrimination, the participants in my study felt generally accepted in Jewish communities, empowered to change tradition, and able to influence Jewish communities to become even more accepting and inclusive. For example, many of them recommended that Ramah encourage discussion about LGBTQ+ issues and include representation of queer Jewish figures. My research demonstrates how the Conservative movement and the Ramah Camping Movement have become more accepting of LGBTQ+ Jews and Jewish women, while also showing how those shaped by Conservative movement institutions are now seeking to create more welcoming and diverse communities.

Sociology & Anthropology

Diversity, Equity, Inclusion, and Mental Health: Evaluating Access, Utilization, and Benefits of Yoga*

Katarina M. Aulbach (Dr. Alexis Franzese) Department of Sociology & Anthropology

Yoga is a multifaceted practice, composed of poses, attention, breathwork, and meditation, with historically religious roots. Although yoga is often conceptualized as a form of physical exercise in current times, traditionally yoga practice has been conducted as a spiritual discipline. Research indicates that yoga is associated with a myriad of mental and physical health benefits, including but not limited to depression, anxiety, and post-traumatic stress disorder, as well as demonstrated effects for

musculoskeletal, nervous, and cardiopulmonary systems. Yet the factors that account for these benefits are not fully understood. Additionally, previous research on yoga tends to overlook spiritual and diversity aspects of yoga practice, which can provide insight into potential influencing factors of the benefits of yoga. Despite its many benefits, across multiple studies yoga is found to be disproportionately used by certain peoples, particularly affluent, white, middle-aged women, thus potentially resulting in yoga feeling excluding for many. Overall, what are the factors that limit perceived access to yoga and as such inhibit attaining its many benefits? This study explores the conceptual linkages among spirituality, accessibility, and diversity within yoga, particularly in terms of the mental health and well-being benefits of yoga practices. We link relevant literatures and frameworks to address four overarching questions: (1) who practices yoga, (2) do existing religious or spiritual beliefs impact one's utilization of yoga, (3) what benefits does yoga yield, and (4) what factors inhibit yoga practice? Ultimately, it is our hope that the insights gained can contribute to future research on diversity in yoga and mental health care overall, ways to promote greater accessibility and authenticity within both, as well as strategies on how to integrate spirituality into mental health services so individuals may attain the greatest benefits.

Representations of Mental Health in Horror and Thriller Film: A Sociolinguistic Analysis

Noelle S. Bates (Dr. Jennifer Carroll) Department of Sociology & Anthropology

The media that individuals consume has the ability to greatly impact personal understanding, judgement, and bias towards certain ideas and groups (Bullins, 2017; Markus, 2017; O'Hara, 2017). Little systematic empirical research has focused on film dialogue as it relates to mental health/illness in horror and thriller cinema. This sociolinguistic study centers around the existence of horror and thriller film as a genre meant to unsettle, intimidate, and provoke fear around a subject. When that subject is a group of people that society interacts with on a day-to-day basis, which in this case is the mentally ill, then how do we negotiate that fear with internal biases? This research was completed through a mixed methods content analysis focused on discourse. Through both open and axial coding of the language used in 16 horror and thriller film scripts, this research is able to confirm the existence and perpetuation of negative, stigmatizing mental health language and will argue for potential impacts on the attitudes and action of audiences and society writ large following media consumption. This analysis employs social labelling theory to discuss how the labels we place on each other carry meaning and tend to follow us through life, affecting various aspects of interactions within the social sphere (Becker, 1963). When films call a character "crazy," they label that individual with stigmatizing, mental health centered language that the character then carries throughout the film. What is more difficult to realize is the lasting impact it has on the audience and their perception of those who are deemed "crazy" by society in everyday life.

A Lack of Access: How Stigmatizing Perceptions from Non-Opioid Users Dictates the Treatment of People Who Use Opioids

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This research aims to explore how stigma against people who use opioids shapes access to and uptake of evidence-based treatments for Hepatitis C (HCV). In 2017, 72,000 people over the age of 12 in the United States died from overdose, and another 2.1 million met the criteria for opioid use disorder (OUD)—all this despite the existence of effective prevention and treatment (Calcaterra et al., 2019). A consequence of these rates of opioid related harm is an increase in once-declining HCV cases,

specifically in Americans ages 20-29, of which the vast majority are due to injection drug use (Morrison & Dattilo, 2017). Over 137,000 new chronic HCV cases were reported in 2018 despite the existence of highly effective curative treatment (Ryerson et al., 2020). The most effective prevention of new HCV infection is treating those who are currently infected. However, treatment access remains low due to numerous social and structural factors, including poor funding, reduced healthcare access, and social stigma (Jones et al., 2015a; Jones et al., 2015b; Joudrey et al., 2019). Notably, the role of "addict" is a spoiled identity that produces negative social outcomes, like a lack of access to medical treatment (McLellan, 2017; Truong et al., 2019). Despite our understanding of the role stigma plays in restricting access to care, the relationship between stigma and access to HCV treatment for people who use opioids remains under-researched. To bridge this gap, qualitative interviews were conducted with OUD treatment professionals and people living with OUD and HCV infection in two neighboring counties in North Carolina, Alamance and Guilford. This analysis uncovers how cultural preconceptions of people who use drugs shape the access to their HCV treatment by connecting social theories of stigma, spoiled identity, and risk environment to poor availability and access to successful HCV treatments for people with OUD.

Fears for the Future: Youth Climate Change Activism

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Climate change is an issue that disproportionately affects younger generations and has motivated many to participate in climate change activism. Previous research on political activism and social movements has focused on material resources as a motivation for action, leaving the importance of imagination and emotion as inspirations to act undertheorized. Chakrabarty (2009) provides a theoretical framework for understanding the emotional motivation to social action in his discussion of climate-change-affected futures that young people struggle to visualize and the anxiety this produces. Considering climate change activism through Chakrabarty's framework allows for the incorporation of imagination and emotion into classical social mobilization theories. The primary question pursued by the current study is how young people's imaginations of a climate-change-affected future shape their activism today. The methodological approach of this study includes semi-structured interviews with 25 young adults ages 18-25 to address what factors have motivated them to join the climate change movement. Learning about young people's perspectives on climate change is important because research has not yet been done on the topic, and the climate crisis will affect them the most directly, and their participation in the movement will likely be a very important factor in its success.

Nostalgia in Travel: Examining Walt Disney World as a Destination that Curates Sentimentality

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Nostalgia, a sentimental longing for the past, can motivate travel, be activated by travel experiences, and create feelings of happiness. This research examines the role that nostalgia plays in travel and the ways in which it can be constructed and curated, using Walt Disney World (WDW) as a case study. The research questions are: (1) how does WDW create a sense of nostalgia for its guests, and (2) what elements of WDW do guests find the most nostalgic? For the purposes of this study, nostalgia is viewed as a personal emotional experience and outlook. The study relies on survey data collected from individuals who follow a Disney guidebook author on Twitter, and through observations in WDW Parks. Respondents of the survey recruited via Twitter and personal connections of one of the authors included over four hundred adults ranging in age from 18 to 67 years old. Results indicate that through

the use of music, scents, marketing and promotional videos, and photographic locations, WDW creates a sense of nostalgia for its guests. Further, results indicate there is a connection between nostalgia and the self, that nostalgia is predictable but personal, that nostalgia can provide an escape from the everyday, and that Disney has used nostalgia to create a place that families return to because of an emotional connection and a sense of Disney as part of familial heritage. These results are valuable in understanding the role that nostalgia plays in tourism and how nostalgia is cultivated in travel and leisure settings.

Perceptions and Conceptualizations of Race and Racism in the Ecuadorian Context*

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The current study addresses perceptions of race and racism in Ecuador. Race and racism have been under-researched and within the Ecuadorian academic field. This study aims to produce scholarship that adds to the field and combat a harmful narrative that was perpetuated in the 90's where politicians claimed: "todos somos mestizos" (we are all mixed) to appease the racial tension. This discourse, which is still part of the Ecuadorian idiosyncrasy, undermined the serious attention needed to address the clear systemic racial issues that the country faced and overlooked the importance and value of the country's diverse ethno-racial demographics. The first phase of the study (fall 2020) focused on the perceptions of minoritized racial groups in the country such as Afro-Ecuadorians and Indigenous groups on three variables; perception of racism, awareness of recent events, and perception of others toward racism, measured in scales that were based on the collected surveys and complemented with three semi-structured interviews with Afro-Ecuadorian individuals The findings of the first phase of this study indicated that Afro-Ecuadorians had slightly higher perceptions of racism and awareness events in comparison to the Mestizo/a and Indigenous groups. Afro-Ecuadorians also believed that others in Ecuador had a lower understanding of racism than the other two racial groups. The continuation of this research in the current semester (spring 2021) will include data collection using the same survey but with a different participant pool; members of the Mestizo (Mixed race majority) demographic. The hypothesis of this study is that awareness of racism will vary by race- Mestizo individuals being less aware, Indigenous identifying individuals more aware, and Afro-Ecuadorian individuals highly aware of racism. The results will be used in conjunction with the previously collected data.

The Rituals of Womanhood: An Autoethnographic, Cross-Cultural Study of Female Coming of Age Ceremonies in Jewish and Latinx Cultures*

Mackenzie Sara Martinez (Dr. Jennifer Carroll) Department of Sociology & Anthropology

For decades, anthropologists have been exploring the ways in which societies celebrate the transition from childhood to adulthood, particularly for young women. To better understand the importance of these rite of passage ceremonies and their cultural roles, this study examines two such rituals: Bat Mitzvahs and Quinceañeras. Through key informants at local places of worship in central North Carolina, the researcher conducted nine semi-structured interviews with girls between twelve and sixteen who had one of these ceremonies. The thematic findings show that coming of age rituals are of greater importance in an American context where religious and ethnic minorities are faced with a loss of cultural identity and practices due to assimilation. While the two celebrations are distinct in the way that the young women prepare for them and the importance given to each aspect of the event, they share many values such as cultural preservation and definitions of womanhood. This study adds to the

growing body of literature surrounding coming of age rituals and uniquely analyzes the cross sections of two distinct cultures.

The Role of Religion in the Lives of Refugees from Africa's Great Lakes Region Resettled in Greensboro, N.C.*

SJ McDonald (Dr. Mussa Idris) Department of Sociology & Anthropology

This paper examines the role of religion in the integration of refugees coming from the Great Lakes Region of Africa to North Carolina. It explores religious gatherings as spaces of community building and resiliency that aid refugees in integrating to their new resettlement environment, as well as the role of church leaders in connecting newly resettled refugees to the diasporic community and other potential resources. This research draws upon data from 15 semi-structured interviews and a year of fieldwork, pre-COVID pandemic, in a refugee church. The interviews were conducted using snowball sampling and participants were identified through peer and community connections. Due to COVID-19, the interviews were completed over the phone or via face-to-face video calls. Fieldwork observation was conducted over the period of a year in Greensboro, North Carolina, at a refugee church, and in Tanzania. The influence of religion on a person's coping mechanisms and ability to maintain hope was explored, in addition to the ways in which a religious community bolsters a refugee's opportunities to acculturate successfully in their new communities. I argue that the role of the church is essential to community building, creating a sense of belonging and resiliency among resettled refugees as they transition to a new culture and creating connections with diverse people who share similar values. My research demonstrates the importance of social networks and leadership to refugee integration. This project builds on scholarship exploring refugee resiliency through religion (Sommers 2001; Adedoyin et al. 2016) and the impact of resettlement on religious practices (Dorais 2007; Schwander 2018). It extends the literature on refugee resettlement processes by connecting refugee resiliency to not only economic self-sufficiency but also integration into religious communities, exploring how resettlement agencies can best support refugees in finding community, including through religious groups.

Decreasing Burnout Among Pre-Health Undergraduates: Does an Authentic Interest in Coursework Matter?

Seth L. McKee (Dr. Alexis Franzese) Department of Sociology & Anthropology

Previous research documents that undergraduate premedical students have a higher risk of burnout, stress, and depressive symptomatology when compared to other undergraduates. Although scholars have speculated on the cause of this high rate of burnout, scholarship has not empirically addressed this trend in relation to individual authentic interest in pre-health coursework. Authenticity, defined as having a sense that one's behavior is aligned with their 'true' self, has been found across many studies to be positively associated with wellbeing. This study proposes that authentic interest in pre-health coursework moderates the known associations between being a pre-health student and experiencing burnout. To address this question, a survey was designed to measure burnout, engagement, and authentic interest in coursework among pre-health students at a mid-sized private university in the southeastern United States. The survey was administered in late fall 2019 to current and past students on the pre-health listserv. Burnout was measured across the axes of exhaustion, cynicism, and a loss of personal efficacy, while engagement was measured across the axes of vigor, dedication, and absorption. Following the survey, seven in-depth semi-structured interviews were conducted with

select participants to provide a more nuanced understanding of results. This study revealed that students experience higher levels of burnout as they progress further into their undergraduate experience. Additionally, an authentic interest in coursework was found to predict engagement across all three axes of engagement. The results provide important insights into understanding why pre-health students may experience higher rates of burnout, stress, and depressive symptomatology than other students. If authentic interest in coursework is indeed a protective factor against burnout, interventions can be made to assess and perhaps facilitate this interest at an individual level and shape pre-health advising at an institutional level.

"Coming Clean: Pathways and Barriers to Transitioning from Animal Agriculture to "Clean Meat"

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"Clean meat", otherwise known as cultured meat, is meat created via animal cell replication. Despite its novel nature, this innovative food technology has revolutionary potential. "Clean meat" production requires fewer resources such as land, water, and energy, creates less waste, and does not harm animals in the process, eliminating the damaging effects of factory farming on the environment, human health, and farmed animals. However, despite proof of concept and backers like Bill Gates and Tyson Foods, there is no "clean meat" product currently available on the market. Therefore, it is uncertain how consumers will react when confronted with the possibility of consuming "clean meat". To rectify that lack of information, I undertook a mixed-methods survey design of Elon students. I selected students foremost for convenience and secondarily because young people tend to be more willing to try new technology. I began by doing 8 preliminary long-form interviews, with Elon students obtained via a convenience sample, to gauge what questions Elon students may have. Once I synthesized relevant information from the initial interviews, I used a Rolodex of Elon student emails that I have access to by virtue of being a student of the university, to create a stratified random sample for short-form surveys, with both multiple choice and short answer questions contained within. Participants were rewarded with a $5 gift card to one of five preselected stores - Irazu, Oak House, Tangent Tacos, Target, and Chipotle. These interviews, and surveys were used to illuminate the pathways and barriers to turning students into conscientious consumers through education regarding "clean meat".

Humanitarians of the Majority World: A Look into the Lives of National Aid Workers

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Humanitarian aid workers provide relief and improve the quality of life for refugees and at-risk populations. The foundation of the International Committee of the Red Cross is 1863 is credited as the first humanitarian aid organization (Davey et al., 2013). The globalization of aid work came with the increased response to natural disasters, displaced populations, and intra- and cross-nation conflict. The onset of the Cold War and World War I and II has evolved humanitarian aid work to the 'developed nations giving aid to developed nations' model observed today. This research takes a mixed methodology in its exploration of the opinions and views of the lived experiences of national aid workers in the majority world. This research aims to give national aid workers a stake in academia and contribute to the existing research using the voices of the majority world. Quantitative data collected by Dr. Tom Arcaro's "National Humanitarians of the 'Global South'" survey sheds light on topics

ranging from relationships with international colleagues, gender, secondary trauma, the structure and improvement of the humanitarian aid sector. Semi-structured interviews with humanitarian aid workers in Iraq, Bangladesh, Sri Lanka, Jordan, and Ethiopia augment the survey data. This research contributes to the scarce literature examining this population, uncovering themes that represent the national aid worker population. Themes include the localization of aid work, the lack of representation in decision-making and administrative positions, and organizational as well as personal response to the COVID-19 pandemic and the Black Lives Matter movement. Future work should continue to examine underrepresented populations within the aid sector and focus specifically on a country of interest.

The Social Impact of Gacaca Courts in the Reconciliation Process in Rwanda*

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Restorative justice is often misunderstood by Western academia in the context of community-based justice systems in postcolonial African nations. The Gacaca courts used in Rwanda after the 1994 genocide against the Tutsi are frequently criticized for their procedures and outcomes. However, a majority of these criticisms come from Western authors who have failed to engage in conversations with Rwandans and observe the effects of the trials. The only people who know and understand the impact of the Gacaca courts are Rwandans. This research project focuses on how the Gacaca trials have contributed to homegrown solutions. It demonstrates the impacts of the trials within Rwandan communities in the ways they brought about reconciliation. In addition to completing a review of the literature on the Gacaca process, I conducted 20 semi-structured interviews with survivors and perpetrators of the genocide who participated in the Gacaca's to assess the impact of the judicial process within their communities. These interviews were conducted throughout November and December of 2020. The Gacaca courts were able to work through just under 2 million cases between 2005 and 2012, dispensing community justice and punishments to the perpetrators through methods of forgiveness and openness, which in turn crucially aided the nation in moving forward. The accounts from participants of the Gacaca courts indicate that the courts in the view of Rwandans and Rwandan professors were highly successful in producing fair verdicts and communal justice in the Rwandan context. While there were challenges, the successes outweigh these issues. The process succeeded in giving perpetrators justice for their crimes and truth to the survivors and community. The research shows how the Gacaca courts allowed for a time of listening, forgiving, and healing amongst communities, fostering communal growth of education programs, health care systems, security, and the overall development of the nation. Each interviewee conveyed their support for the Gacaca courts and expressed their belief in a Rwandan solution for a Rwandan issue.

Diversity in the #MeToo Movement*

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The #MeToo Movement gained prominence in 2017. The #MeToo Movement is a mainly social medial based social movement that fights against sexual assault and sexual harassment. The hashtag began to go viral with people using the hashtag to share their stories of sexual assault and harassment. The Movement has received much criticism for being a feminist Movement geared towards white women when it in fact was created by Tarana Burke, a Black female activist. The intent of this research is to first discover who is sharing and participating in the Movement through Twitter and then to examine what factors might yield greater diversity in #MeToo participation. By comparing the

diversity in responses to Black women sharing their stories to white women sharing their stories we are able to see that the race of the person sharing their #MeToo story impacts the diversity of respondents compared to white women. By examining tweets written in response to well-known people sharing their stories, we find that the accusers' race and gender shape who shares their story in response, particularly for women. We also examine patterns of response and argumentative structure within responses as a function of the gender and race of alleged perpetrators. By coding these tweets we are able to who is tweeting in support of the victims, the accusers, or the #MeToo Movement. Our findings suggest some current limitations of the #MeToo Movement such as a lack of inclusion but also reveal promising routes for its expansion and greater diversity.

Sport Management

Analyzing the Financial Structure Between the MLB Draft and Minor League Baseball: The Salary Fairness in Minor League Baseball

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The purpose of this current study is to investigate the salary fairness of minor league baseball by comparing players' average salaries to their Major League Baseball (MLB) Draft signing bonuses. Current tension between Minor League Baseball (MiLB) and MLB is at an all-time high. Some of these tensions have culminated from financial arguments between the two sides. Labor reform and increased payrolls have steadily increased across the major leagues, while minor leaguers have fallen behind with salaries that are below the federal poverty line (McDowell, 2018). Some minor leaguers only net between $3,000 to $7,000 a year despite working more hours than average workers (McDowell, 2018). Since 1976 Major League Baseball salaries have increased over 2000% with minor leaguers only seeing a raise of roughly 75% in that period of time (McDowell, 2018). However, a small percentage of minor leaguers are getting paid fairly through signing bonuses when they are drafted in the MLB Draft. Players drafted in the first few rounds usually receive upwards of a million dollars if they sign with the teams while many of the late-round draft picks are only seeing the minimal salary described above. All MLB teams combined spend on average over $100 million on bonuses each year in the draft (Halverson, 2011). This compensation structure encourages players to sign and go straight to the minor leagues instead of going to play in college. The research question that this study is addressing is how increasing MLB Draft signing bonus compares to the change in minor league baseball salaries. The data of average minor league player salaries and first round signing bonuses over the time period of 10 years. will be collected and cleaned for a data analysis. A regression analysis will be employed to test the relationship between the minor league salaries and the signing bonuses. Findings of this empirical study shed light on salary fairness of minor league baseball players and support the fair dispersion of salaries within the team by reallocating signing bonuses into salaries for all minor league players.

#JumpingThroughHoops: A Case Study on Differences in Marketing Men's and Women's Basketball on Twitter*

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Twitter is the second most popular social media platform behind Facebook with roughly 340 million users worldwide (Omnicore, 2020). Sports content makes up 41% of all tweets (Parganas, Anagnostopoulos, & Chadwick, 2015). Of all users, 44% are 18–24 years old and 42% have a college

degree (Newberry, 2021) making Twitter a valuable platform to reach college sports fans. Twitter provides college athletic departments a platform to share real-time game information, forge long-term connections with fans, and market its brand (Watkins & Lee, 2016). Despite Twitter's importance as a communication medium, a disparity exists when marketing women's sports. Hull (2017) found that only 5% of the overall messages sports broadcasters sent on Twitter during a two-week time were about women's sports. As symbolic annihilation theory states, when the media drives more attention to men's sports, they influence "the general public into thinking that women's sports do not matter" (Coche, 2015 p. 224). In view of the marketing value of Twitter, a case study approach was taken (Crowe et al., 2011) to investigate differences in how a mid-major collegiate athletic department uses Twitter to market their basketball teams. Tweets were collected from men's and women's basketball Twitter pages and the athletic department page during a single season. All tweets were coded into four themes derived from previous literature (Abeza et al., 2017) based on their marketing purposes (i.e., selling, information, promotion, and branding). Twitter content from men's and women's games (N = 34; N = 30) were analyzed. Results indicated of all tweets (N = 1,160), 16% of men's tweets were retweeted by the athletic department compared to .09% of women's tweets. Tweets were focused on selling men's basketball whereas content about women's basketball was largely posted in conjunction with the men. Findings demonstrate that at this institution, inequities exist in the representation of women's basketball via Twitter in both content and frequency. These results are not surprising and support symbolic annihilation theory. Hopefully college athletic departments will examine their Twitter behavior to ensure marketing of athletics' programs is supportive and produces more equitable representation for women's athletics.

Strategic Communications

Authenticity Driving Change: Identifying Cues that Indicate Authenticity in Brand Storytelling Advertisements

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Prior research has shown the effectiveness of brand storytelling advertisements in both elevating brands' likability measures and increasing consumer purchase intent. Further research has demonstrated that authenticity, or being genuine, within these advertisements is a key driver of audience resonance and believability. However, previous research has not explored what the cues or techniques are within these advertisements that signal authenticity to consumers. This current study has two goals: (1) to uncover consumers' definitions of authenticity in advertising, and (2) to identify what cues in brand storytelling advertisements signal authenticity to audiences. For the purpose of this study, brand storytelling was defined as any video advertisement with a narrative structure, centered on a social issue theme and not explicitly selling or promoting a product. To answer these questions, the researcher conducted three focus groups among students who are 18-22 in age and studying a range of majors at three universities. Three examples of brand storytelling ads were shown to each focus group, allowing for individual reactions to different storytelling approaches and techniques. Participants were also asked a series of open-ended questions to gauge their opinions on authenticity's connection with brand storytelling. The research uncovered four main cues that led to perceived authenticity. First is consumer relatability; participants found advertisements with speakers they could relate to as more believable. The next is messaging indicating action. Participants felt an action item, such as a website for donations, made an advertisement authentic. Third is an appeal to empathy; the deeper the emotional connection participants felt with an advertisement, the more authentic they perceived it to be. Lastly is company self-awareness; participants felt a company's ability to demonstrate its role in

perpetuating societal change was important in an ad being perceived as genuine. When these cues are included in a brand story advertisement, audiences are more likely to trust the brand communication as authentic, leading to increased consumer interest and ultimately strong brand loyalty. This study benefits marketers and the advertising industry by identifying and analyzing the elements creative producers should include in advertisements to develop authentic brand stories that better connect with their audiences.

World Languages and Cultures

Image is Everything: #MeToo VS. #BalanceTonPorc*
(This project will be presented in French.)

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Ever since its media explosion in the United States in 2016, the #MeToo movement has grabbed the public's attention as it allows survivors of sexual violence everywhere to support each other through their shared experiences and then, in turn, provide an avenue to open up a conversation. After the Harvey Weinstein scandal came out and attracted international attention, the French came up with their own version, #BalanceTonPorc, translated in English to "rat out your pig" which has a decidedly different approach. #BalanceTonPorc takes the #MeToo movement beyond the original goal, and invites the victims to name and fight back against their attackers. While other scholars have conducted comparative studies of these two movements in recent years, the question my research specifically seeks to answer is: "How does the public perception and ultimate effectiveness of movements like #MeToo and #BalanceTonPorc in the media change due to their own cultural contexts?" This question exposes the gap in current research by explaining that even though the two different hashtags are aimed towards survivors of sexual violence, the context of each is independent from the other, in that #MeToo illuminates survivors while #BalanceTonPorc focuses on outing the attackers. In order to conduct the research, the methodology included a collection and analysis of a series of previous studies on the two movements, both separately and directly compared to one another, in order to determine similar and contrasting aspects. Then, sample posts from different popular social media were chosen and studied to determine key words and patterns among the attitudes behind both movements. I also examined the evolution of legal and ethical repercussions as a result of the worldwide spread of these two movements. While my research is still ongoing, the goal will be to determine if there is a difference in public perception of each version of this social media outcry and whether it changes the effectiveness of actions taken to rid the world of sexual violence. This research will be presented in French.

How Gender is Presented in Language

Sally Doehr (Dr. Elena Schoonmaker-Gates) Department of World Languages & Cultures

In society, language has an important role because language is the reason that people can communicate with and understand each other. Furthermore, the language a person speaks depends on factors such as the country they live in and the city or region, as well as personal qualities such as the person's race, age, sexual identity, and gender. This project focused specifically on the relationship between language and gender, and how gender is displayed when someone speaks. Within gender, there are many differences between how men speak and how women speak. How and why this relationship exists and how society perceives it drove the main question of this study: What elements of language are

indicators about a person's gender and why? I gave ten participants (all native English speakers from the United States) a transcript of a dialogue that occurred between two people, one man and one woman, and they had to guess the genders of the speakers. Then, they had to identify words and phrases to support their decisions. All of the participants correctly identified the gender of the speakers in the dialogue, but the words and phrases listed as evidence were vastly different for the man and the woman. This indicates that in our society there are clear, shared societal norms about what constitutes "masculine" and "feminine" speech. These specific words and phrases, along with data regarding how the participants felt about the difficulty of making their decisions, are included in this study. Overall, the results from this study, and those from previous literature, suggest that women and men use different vocabulary, syntax, and grammar when speaking, and these specific words, phrases, and speech patterns are picked up starting at a young age. People must choose whether or not to adhere to these norms as they grow up and decide what language and speech qualities best represent their personal identity. The specific words and phrases from the study will be explained in my presentation, along with further thoughts about these societal language norms.

Oh Mother, Who Art in Hell: Examining Internal and External Conflicts of Immigrant Women Through the Work of Carmen Jiménez
(This project will be presented in Spanish.)

Jo A. Fradkin (Dr. Mayte de Lama) Department of World Languages & Cultures and International & Global Studies Program

The dictatorship of Francisco Franco lasted in Spain from 1939-1975, and is often characterized by violence, fear and oppression. It was also during this time that Franco's ideology confined women to a single standard: weak and submissive. However, after the death of Franco in 1975 and the subsequent transition in Spain from dictatorship to democracy, the country saw a boom in literature written by women, and a clear change among themes being written about. With the freedom to write without censorship, female authors began taking risks and were empowered to write about topics once considered inappropriate. It is clear that the insurrection of female authors was not only necessary, but inevitable. It is then evermore important to highlight female authors who emerged after the Franco era, and use their writing to better understand and expose societal struggles and change. The present research is a case study of Carmen Jiménez' 2008 award winning novel, *Madre mía, que estás en los infiernos.* Through this novel, readers not only develop a deeper understanding of female writing and feminism, but also are exposed to a complex look at immigration within the Spanish-speaking world. In her effort to change the way women are represented in Spanish literature and foster self-acceptance, Jiménez also examines domestic violence, machismo, and immigration as a form of escape. The aim of the present research is to contextualize the unique contributions of Jiménez through an analysis of the struggles her protagonist faces, realizing they directly contrast with previous perspectives on women and motherhood. Ultimately, the research concludes that Jiménez carefully debunked the narrative that the only reason women immigrate is economic instability. Through an analysis of Jiménez' writing, it is clear that she serves as an example of modern women who write about controversial feminist topics in the post-Franco era, ultimately leading to a deeper understanding of realistic challenges women face.

Traumatic Memory in Marie-Célie Agnant's Femmes aux temps des carnassiers and Le Livre d'Emma*
(This project will be presented in French.)

Lucia Lozano Robledo (Dr. Sarah Glasco) Department of World Languages & Cultures and International & Global Studies Program

My research is seeking to answer the question: How does Marie-Célie Agnant represent the effects of traumatic memory through her characters' development in her novels Femmes aux temps des carnassiers and Le Livre d'Emma? Femmes aux temps des carnassiers considers the intergenerational psychological impacts of decades-long terror in the context of the Duvalier dictatorships in Haiti. Similarly, in Le Livre d'Emma traumatic memory plays a critical role in the development of Emma's character as Flore, her interpreter at the psychiatric hospital, seeks to piece together Emma's life story. Several implications related to mental health and how memory is constructed and embedded in historical recollection at governmental, familial, and individual levels are raised in this analysis. Through an in-depth literary analysis of both novels and supplementary secondary scholarly articles on traumatic memory, this research will assess how Agnant uses language to communicate how her characters process trauma as well as how interpersonal dynamics are shaped by these experiences in the novels. Considering the holistic impact of trauma in addition to outside factors, this research hopes to illuminate how Agnant's characters survive and navigate traumatic memories of the past, and how those can be integrated into and haunt the present. Although this research is still in progress and there is much to be discovered, I expect to contribute to the studies of francophone literature that explore the role of traumatic memory in the lived experiences of members of the Haitian diaspora. This research presentation will be in French.

Immigrant and Refugee Struggles as Revealed in Narratives by Two Female, Francophone Authors
(This project will be presented in French.)

Julia L. Madden (Dr. Sarah Glasco) Department of World Languages & Cultures

This presentation will explore and analyze the similarities and differences of the impact of immigration on children by looking at two young female protagonists, An Tinh in "Ru" by Kim Thúy, and Doria in "Kiffe Kiffe Demain" by Faiza Guène. Through close readings of these novels, I will compare and contrast the way they write about their upbringings, identities, and the struggles that come with being a young child trying to navigate a complex world. An Tinh fled from Vietnam to Quebec with her family to escape the Vietnam War and the new communist government. Doria, on the other hand, is a teenage girl, born in France to immigrant parents, trying to navigate the outskirts of Paris with her Moroccan immigrant mother after her father leaves them to go back to Morocco. This will be supplemented by research studies on the children of refugees and immigrants from Canada and France and scholarly articles about the novels themselves to identify common themes related to identity development in refugees and immigrants as they seek to belong in between two cultures. The comparison of An Tinh and Doria in their respective novels will show how literature can contribute to the understanding of the challenges faced by immigrant and refugee families in francophone countries. It will help to provide nuance to the conversation about the struggles faced in other immigrant communities. This research is still in progress and much more will be discovered and reported at SURF. This presentation will be in French.

Investigating Patient Preference: A Study Comparing Informal and Professional Interpretation Methods in Healthcare*

Kamaria L. Majors (Dr. Elena Schoonmaker-Gates) Department of World Languages & Cultures

Although the United States does not have an official language, American society heavily caters to English speakers, leaving many immigrant populations at a disadvantage. Particularly in healthcare, patients with limited English proficiency (LEP) struggle to receive quality care due to the language barrier between them and English speaking healthcare providers. Previous studies have focused on the experiences of healthcare providers with translation and interpretation methods and their efficacy, finding that providers often prefer the use of professional interpreters over informal or technological methods. However, there is a lack of research focusing on the patient perspective. The present study aims to close the gap in research by surveying 15 native LEP Spanish speakers. Participants with experience using informal and formal interpreters during healthcare appointments were asked to rate their comfort levels, on a scale of 1-5 ranging from very uncomfortable to very comfortable, using formal, informal and technological interpretation and translation services. Participants were found to feel more comfortable with informal methods than formal or technological services. Additionally, they were asked to indicate how the respective method impacted their experience with their provider on a scale of 1-5 ranging from very negatively to very positively. Results showed formal methods were perceived more positively than informal methods due to the knowledge and training professionals had versus untrained family members and friends. Participants who had experience with more than one method were asked to pick which they preferred using and explain their choice, which showed that most participants preferred the use of informal methods, despite knowing the benefits of using a formal interpretation service. Informal methods were chosen due to the comfort, ease and convenience associated with using family members and friends rather than professionals. The results of this study provide greater insight for healthcare professionals to meet the needs of their patients by catering to their preference, while also revealing that there are areas of weakness in using professional interpreters, such as patients being less comfortable with their presence. Further research can be done to analyze ways to improve professional interpretation services, so that patients feel more comfortable with this option.

Social Justice à la Coco Chanel*
(This project will be presented in French.)

Ana N. Newberry (Dr. Sarah Glasco) Department of World Languages & Cultures

While questions of environmental sustainability have long circulated in the fashion industry, the role of social justice in business settings has recently come to the forefront of the apparel industry’s social media content. As Gen Z matures and gains more buying power in the global fashion marketplace, these consumers in particular expect brands to be authentically engaged in Corporate Social Responsibility, not only for an environmentally conscious business, but also for one that builds and uplifts marginalized communities (n.a. 2019). The essential question addressed in this research is whether monetary investment into social justice advocacy programs results in higher profits for French apparel companies. Although it is impossible to take into consideration every apparel company in France, this intensive company spotlight on the top seller of women's apparel, handbags, and perfume, CHANEL, aims to create a framework of investing in people for other businesses and industries. Founded by the company itself, La Fondation CHANEL partners with organizations that uplift the leadership of women and girls of color, contributing over $20 million to grassroots organizations led

by people of color all over the world since its initial creation in 2011 (La Fondation Chanel, 2020). For a thorough investigation of this topic, both quantitative and qualitative methodologies are used in research. These methods produce two major outcomes: The first, that while business growth may appear slower in the short term, that these investments create real results (jobs, grants, loans, and healthcare centers) that better the lives of real people; The second outcome, that financial investment in Corporate Social Responsibility programs with a focus on social justice will increase operational profits in the long term when these programs are authentic, effective, and focused on people, not profits. The objective of this research is to demonstrate that investment in people is not only good for society, but also good for business. Discussion of these findings may open up other conversations into the ethics of capitalism, the authenticity of social justice initiatives, and consumer expectations of Corporate Social Responsibility. This presentation will be in French.