



Spring Undergraduate Research Forum

Welcome to SURF 2019

The 26th 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. This year, SURF has 233 presentations, two interdisciplinary symposia named "Rising to the Challenge: South Asian Communities and Globalization" and "Sustainability across the Disciplines and in Community-Based Partnerships". Four students from Williams High School, Burlington, NC also join us this year by presenting their poster. Each SURF abstract was reviewed by two Elon faculty with disciplinary expertise.

SURF is an integral part of **CELEBRATE!** – a weeklong series of events that bring 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. Barbara Miller
Prof. Joel Hollingsworth	Dr. Chris Richardson
Prof. Erin Hone	Dr. Paula Rosinski
Dr. Tonmoy Islam	Dr. David Vandermast
Dr. India Johnson	Prof. Bill Webb
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Dr. Titch Madzima	Dr. Chad Awtrey (Associate Director)
Dr. Kristina Meinking	Dr. Qian Xu (Associate Director)

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

- 1) Lead to new scholarly insights and/or the creation of new works;
- 2) Add to the discipline; and
- 3) 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.

The Undergraduate Research Student Association (URSA) is an organization on campus that acts as the student-run counterpart to Elon's Undergraduate Research Program. They help first-year 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.

To contact URSA:

ursaelonuniversity@gmail.com.

Johanna Hilpuesch, President of URSA: jhilpuesch@elon.edu

Instagram: @elonursa

PROGRAM LISTING BY SESSION AND TIME			
<u>Poster Session I</u> (8:30am-9:50am) 4			
<u>Oral Presentation Session I</u> (10:00am-11:40am)			
McKinnon D	12	Global Commons 103	14
McKinnon E	12	Moseley 215	14
McKinnon F	12	Isabella Cannon Room	14
Lakeside 212	12	Inman 112	14
Lakeside 213	13	Yeager Recital Hall	15
Lakeside 214	13	Koenigsberger Learning Center 127	15
<u>Oral Presentation Session II</u> (12:30pm – 2:10pm)			
McKinnon D	16	Global Commons 103	18
McKinnon E	16	Moseley 215	18
McKinnon F	16	Isabella Cannon Room	18
Lakeside 212	16	Inman 112	19
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<u>Oral Presentation Session III</u> (2:20pm – 4:00pm)			
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McKinnon F	20	Moseley 215	22
Lakeside 212	21	Isabella Cannon Room	22
Lakeside 213	21	Inman 112	23
<u>Poster Session II</u> (4:10pm-5:30pm) 8			

ABSTRACTS BY DEPARTMENT/PROGRAM			
Accounting	32	Management & Entrepreneurship	97
Art & Art History	32	Marketing & International Business	102
Biology	35	Mathematics & Statistics	104
Chemistry	44	Music	109
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Computer Science	58	Physical Therapy Education	114
Economics	61	Physics	117
Education & Wellness	66	Political Science & Policy Studies	121
English	75	Psychology	126
Exercise Science	83	Public Health Studies	138
Finance	90	Religious Studies	144
History & Geography	92	Sociology & Anthropology	147
Human Service Studies	92	Sport Management	153
International & Global Studies	95	World Languages & Cultures	156

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

The Great Hall, Global Commons

Poster #	
1	Autumn D. Rose Dr. Rissa Trachman Mortuary Distribution in Spatial Context: An Intraregional Analysis of the Ancient Maya of Northwestern Belize
2	Jenna L. Barone Dr. Daniel M. Haygood Making Sense of a Celebrity Suicide: Qualitative Analysis of High-Engagement Tweets Following the Suicide of Anthony Bourdain
3	Emily Cooper Dr. Alfred Simkin Investigating the Relationships between Varying Levels of Expressivity of Transposons and piRNAs in <i>Drosophila simulans</i>
4	Victoria Bond Prof. Renay Aumiller The Past is a Grotesque Animal Behind Us
5	Maddie Craft Dr. Jeffrey Carpenter Instagram Microcelebrity and Educators' Uses of Instagram
6	David R. Ogburn Dr. Karl Sienerth Study of Fluorescence and Electrochemiluminescence Quenching of Luminescens by Explosives
7	Abigayle P. Barker Dr. Srikant Vallabhajosula & Dr. Melissa Scales Analysis of the Center of Mass and Center of Pressure Characteristics in Children with Idiopathic Toe Walking with and without the Use of Carbon Fiber Footplates
8	Matthew D. Foster, Michael J. Borucki, & Ryan Paxson Dr. Jonathan Su On Demand Transdermal Drug Delivery
9	Melissa K. Birdsell & Giulianna C. Castronova Dr. Eric Hall Coaching Behaviors and Athletes Ability to Achieve Flow
10	Nicole M. Kister Prof. Erin Hone Math Anxiety: Is There a Correlation between Awareness and Reduction?
11	Nicole A. Karabas & Elena M. Cheek Dr. Sabrina L. Thurman How Do Gains in Locomotor Experiences Over Time Affect Infants' Naturalistic Exploratory Behaviors?
12	Julia Field Dr. Jennifer Eidum Perceptions of Service Learning
13	Christian P. Frey Dr. Sean McMahon Exploring the External Complexities of Reducing the Line at Mail Services
14	Roxanna R. Wood Dr. Brian Lyons Not all Work Sample Tests are Created Equal: Investigating the Impact of Test Fidelity on the Predictive Validity of Work Sample Tests

15	Rachel Wingrat Students' Evolving Theories of Writing	Dr. Heather Lindenman
16	Sydney Brown & Isabel Gesen A Sensitivity Analysis on a Model of Dengue Fever Focusing on How Different Parameters Affect the Basic Reproduction Number	Dr. Karen Yokley
17	Annamaria Sotolongo Linguistic Framing of Charitable Donation Requests as Verbal Behavior: An Exploratory Exercise in Translation	Dr. L. Kimberly Epting
18	Genna M. Kasian Diversity on National High Courts: A Comparative Analysis of Background Characteristics Predicting the Likelihood of Selection for the National High Courts of Australia, Canada, the United Kingdom, and the United States of America	Dr. Elisha Savchak-Trogdon
19	Leah Kay What Would be the Answer to the Answer Man? How the Grateful Dead Developed a Religious Following	Prof. LD Russell
20	Grace B. Flink Incorporation of Contemplative Practices in Higher Education: Student and Faculty Perspectives	Dr. Alexis Franzese
21	Kelly P. Simonson Analysis of Potential Contributing Factors to Great British Bake Off Success	Dr. Laura Taylor
22	Sydney B. Thornton Quantifying Nanoparticle Release from Surface Coatings via Dermal Transfer	Dr. Justin Clar
23	Elizabeth S. McDonald Factors Influencing Recycling Behavior among College-Aged Students	Dr. Alexis Franzese
24	Daniel J. Cavarretta & Lauren E. Mihalek Building a Case for Affect Regulated High-Intensity Interval Training: It's a HIIT!	Dr. Eric Hall
25	Abigail C. Knowles Current and Goal Self in Past and Present Anorexia Nervosa	Dr. Bilal Ghandour
26	Ty Cryan, Karan Patel, Yousuf Siddiqui, & Kenzie Talhelm* Predicting Professional Sports Team Records with Confidence Intervals	Dr. Ryne VanKrevelen
27	Jonathan A. Martinez Implications of the Cross Education Phenomenon on Rehabilitation and Training	Dr. Matthew Wittstein & Dr. Stephen Bailey
28	Jose Daniel Castillo Solano, Kayla M. Ervin, Emily E. Hughes, & Tristan K. Scarce A Call for Clarity: An Assessment of the Accessibility, Usability, and Simplicity of Transposable Element Annotation Programs	Dr. Alfred Simkin
29	Ryan Cranston Does an Organizational Change Lead to a Coaching Change? The Impact of Reclassification to Division I on the Head Men's Basketball Coaching Position	Dr. Tony Weaver

30	Cameron Mullins, Hannaleigh Pierce, & Mackenzie Martinez "Either I'm Good at My Job or They're Good at Hiding It": RA Perceptions of Their Role in Responding to Substance Use at Elon	Dr. Jennifer J. Carroll
31	Sarah Lord To Farm or Not to Farm A Cross-Sectional Study of Tobacco Production Post-Federal Deregulation	Dr. Carrie Eaves
32	Kylie J. Donahue Fine-Tuning Focus: Exploring Electrophysiological and Attentional Responses to tDCS	Dr. Rachel Force
33	Francesca A. Music "The Struggles of Fertility Are More Difficult than the Struggles of Cancer": Adolescent and Young Adult Cancer Survivors' Perspectives on Fertility Preservation	Dr. Cynthia Fair
34	Jessica K. Burchett The Feminine and the Freaks: Gender and Mental Health Status Linguistic Frames Differentially Impact Perceptions of a Hypothetical Individual	Dr. L. Kimberly Epting
35	Briana Brady A Complete Determination of 2-Adic Polynomials of Degree Twice an Odd Number	Dr. Chad Awtrey
36	Nicole M. Harrison Older Sibling Perceptions of Family Roles in Bilingual Households	Dr. Judith Esposito
37	Carson N. Davis, Elena M. Lostoski, & Isaac J. Sasser Modeling Capillary Action through Tube with Internal Rod	Dr. Jonathan Su
38	Ryan McElhinney Building Social Identity through Consumer Values - A Social Network	Dr. Erika Lopina
39	Sabrina Tuton-Filson A Balanced Life: Applying Rhetorical Strategy to the Creation of Branding Materials	Dr. Jessie Moore
40	Polina A. Volgunina Self Perceptions of Body Image, Weight Control Practices, and Body Composition in NCAA Division I Female Athletes	Dr. Svetlana Nepocatych & Dr. Takudzwa Madzima
41	Justin D. Smoot Exploring Flight Characteristics of Model Rockets	Dr. Sirena Hargrove-Leak
42	Elise Walton Comparing Gait Variability and Static Postural Sway in Cancer Survivors with and without Taxane Chemotherapy	Dr. Srikant Vallabhajosula, Dr. Elizabeth Evans, & Dr. Takudzwa Madzima
43	Eleanor R. Scimone Catalytic Cyclization of 1-amino-1-deoxy-D-galactitol towards a Renewable Alternative to Petroleum-Based Medicines	Dr. Jennifer Dabrowski

44	Connor K. Simpson Comparing Methods of Mixing Excitation Mechanisms for Modeling Composite Galaxies	Dr. Chris Richardson
45	Micaela C. Malachowski Do Gritty Teachers Create Grittier Students? Impact of Teachers' Dispositions on Student Mindset	Prof. Erin Hone
46	Meagan C. Branch Investigation of the One Carbon Metabolism Pathway and Methylation Production	Dr. Linda Niedziela
47	Jack J. Amend Computational Gerrymandering: Algorithmically Drawing District Lines for Fair Elections	Dr. Scott Spurlock
48	Kimberly Asin Wilson The Framing of Refugee Status and of Refugees through U.S. Presidential Discourse Following September 11, 2001 until September 11, 2018	Dr. Vanessa Bravo

* The presenters of this study are students from Williams High School, Burlington, NC.

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

The Great Hall, Global Commons

Poster #	
1	Micalah A. Collins Dr. Muriel Vernon Diversity and Racial Equity in Higher Education
2	Wynter Wates Dr. Naeemah Clark Pregnancy in Film: How Do Filmmakers Demonstrate Industry Portrayals of Pregnancy and Childbirth in Modern Films?
3	Alyssa N. Smith Dr. Tonya Laakko Train Oxytocin and Its Effect on the Neuroblastoma Cell Line, SH-SY5Y
4	Danielle L. Marzullo Dr. Shannon Duvall Comparing Physical and Virtual Educational Practices
5	Gilby Schultz Dr. William Moner How Do Gaming Streamers Develop Their Brand? A Look into Channel Recognition and Audience Rapport among Twitch and YouTube Streamers
6	Erin Armstrong Dr. Jennifer Dabrowski Investigating the Effects of Stereochemistry on the Cyclization of Sorbitol and Allitol Sugars and Non-sugar Model 1,4-Pentanediol by B(C ₆ F ₅) ₃ and Allylsilane Co-Catalysis
7	Sara R. Gostomski Dr. Stephen Byrd Least Restrictive Environment Doesn't Look the Same: Three Case Studies in the Alamance Burlington School System
8	Keikichi M. K. Littleton Prof. Lauren Kearns Comparing the Mental and Physical Aspects of Yoga to Determine Which Has a Greater Impact of Decreasing Performance Anxiety in Dancers
9	Emily P. Keller Dr. Caroline Ketcham Implicit Bias and Bias Training in Healthcare Providers
10	Shreya P. Patel, Samantha Everett, & Chelsea Comeau Dr. Srikant Vallabhajosula Determining the Effects of a Cooling Vest on Gait in Those with Multiple Sclerosis
11	Elana D. Kaplan Dr. Amy Overman Examining the Range of Autobiographical Memory and the Relationship to Associative Memory
12	Skylar Barthelmes, Justin Smoot, & Stephen Blackwell Dr. Jonathan Su Human Powered Water Purification
13	Nicole L. Galante Dr. Jessie Moore Breaking Down Barriers: A Rhetorical Analysis of College Materials Aimed at First-Generation College Students
14	Adrienne M. Hayes Dr. Carmen Monico iAct: A Student Led Active Bystander Program

15	Chloé A. Dardenne Examining the Influence of Organizational Cultural Values on Employees' Organizational Citizenship Behavior	Dr. Brittany Mercado
16	Peter Komlofske Cyclic p-adic Polynomials of p-power Degree	Dr. Chad Awtrey
17	KellyAnn Bonanno What Would You Do? Predicting Recommendation of Resources in a Hypothetical Sexual Assault Situation	Dr. CJ Fleming
18	Diana Xiomara Pinel Urrutia Integrating Cross-Cultural Students across First-Year Writing	Dr. Jennifer Eidum
19	Victoria A. Bolger Media Representations of Women Supreme Court Nominees	Dr. Elisha Savchak-Trogdon
20	Sarah V. Winkelstein Gender Bias in the Portrayal of Female Supreme Court Justices in Print Media	Dr. Elisha Savchak-Trogdon
21	Alyssa M. Schlenter Evaluating the Role of Resiliency in Preventing Student Burnout within Memoirs of Medical Education	Dr. Alexis Franzese
22	Daniel L. Wallowicz & Cory B. Weller Common e-Cigarette Constituents' Effects on Neophobia of Adult Zebrafish	Dr. Eric Bauer
23	Sasha Kagan Fashion as Impression Management: How What We Wear Communicates and Manages Perceptions of Identity	Dr. Alexis Franzese
24	Lane R. Adams The Effects of Simultaneous Auditory Stimuli on Cognitive Function	Dr. Eric Hall
25	Alexandra N. Grillo Changes in Sustained Interaction in Infant-Mother Dyads across Locomotor Development	Dr. Sabrina L. Thurman
26	Robert L. Elmore The Mayer Markov Chain: Using Statistical Methods to Generate New Guitar Solos in the Styling of John Mayer	Dr. Andi Metts
27	Put Usaphea Vanna Analysis of Adonitol as a Resource for Future Sustainable Consumer Products	Dr. Jennifer Dabrowski
28	Robert Feather & Joseph Paturzo COMSOL Simulation of Magnetoactive Elastomers to Inform Material Design and Optimization	Dr. Benjamin Evans
29	Mikaela A. Schultz Using a Linear Regression to Estimate the Average BMI of Individuals Aged 12-20	Dr. Ryne Vankrevelen
30	Laura Rossi Gendered Attitudes towards the Criminalization, Perpetration, and Victimization of Revenge Porn in the United States	Dr. Rena Zito

31	Madeline J. Piper Evaluating the Biopsychosocial Needs of Internationally Adopted Children with HIV	Dr. Cynthia Fair
32	Natalie J. Sulzinger & Jessica K. Burchett Guess Who's Coming?: Demographic Information from the Leading Women in Audio Conference	Prof. Fred Johnson
33	Ashley Andrews Grammar Guides across the Disciplines	Dr. Jessie Moore
34	Ryan J. Bernardi Assessing Discourse Instruction in an Applied Calculus Course	Dr. Aaron Trocki
35	Matthew D. Foster Building an Optical Coherence Tomography Imaging System for Personalized Cancer Treatment	Dr. Richard Blackmon
36	Amy E. Belfer LGBTQIA Young Residents of Alamance County, NC	Dr. Carmen Monico
37	Juliette T. Firla Putting Journaling in your Teacher Toolbox	Prof. Paula Patch
38	Shilpa A. Mookerji "Once in a Dark Land, There Was a Creepy Octopus!" A Study of Young Children's Storytelling	Dr. Maureen Vandermaas-Peeler
39	Dan J. Yameen, David G. Norfleet, Charles M. Walsh, & Jonathan C. Duen Innovative Propeller Designs for The Future	Dr. Jonathan Su
40	Brendan M. Thiry Examination of Living Learning Programs in NCAA Division I Athletics Institutions: How Can Access Be Increased for Student-Athletes?	Dr. Eric Hall
41	Dara Sypes, Emily Phillips, Caitlin Osborn, & Sarah Hynes Impact of Acute Aerobic Exercise on Cue Reactivity in Heavy Episodic Drinkers	Dr. Stephen Bailey & Dr. Stephen Folger
42	Elizabeth McFarland Mentoring Novice Teachers to Improve Teacher Retention	Dr. Joan Barnatt
43	Jake Boyar Kinetic Studies of the Aqueous Carbonate System by Raman Spectroscopy	Dr. Anthony Rizzuto
44	Paige S. Knapke Do Gritty Teachers Create Grittier Students? Implications of Teachers' Dispositions within the Classroom Environment	Prof. Erin Hone
45	Allison Ivan Movement as a Coping Mechanism When Dealing with Cancer, Loss, and Grief	Prof. Renay Aumiller
46	Bryanna M. Chazotte Terrestrial Snail (<i>Helix</i>) Response to Acceleration versus Velocity in Vibrational Stimuli	Dr. Eric Bauer

47	Jack J. Amend & Mason C. Seeger Dr. Richard Chapman & Dr. Saad Biaz Collision Avoidance System for Unmanned Aerial Vehicles Using LiDAR and Optical Flow
48	Deirdre Kronschnabel Dr. Glenn Scott Telling the Stories of Trauma Survivors: How Journalists Navigate Interview Relationships in News Reporting

Note: We ask **all** members of the Elon community to scan their Phoenix cards at one of our card tapping stations at the poster sessions in the Great Hall. This will help the Undergraduate Research Program track attendance at these sessions for both presenters and attendees. **Students** will get a chance to win an Amazon gift card.

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

McKinnon D (Moderator: Emily Lane) [Dr. Buffie Longmire-Avital]

10:00 am	Bridgette Agbozo & Tres McMichael Dr. Buffie Longmire-Avital "Even over the Rainbow, They'll still Call Me n*\$\$@#": Exploring the Intersectional Identities of Emerging Adult Black Gay Men
10:20 am	Alexis Roberts & Bridgette Agbozo Dr. Buffie Longmire-Avital Mothering through Discrimination: Exploring How Black Mothers Cope with and Socialize the Responses Their Daughters Give to Discrimination Stress
10:40 am	Jennifer L. Finkelstein Dr. Buffie Longmire-Avital She Does Not Want Me To Be Like Her: Eating Pathology Risk in Black Collegiate Women and the Role of Maternal Communication
11:00 am	Sarah Branchfield Dr. David Buck Perceptions of Gender Role Violation in Transgender Individuals: How are Violations Defined?
11:20 am	Megan E. Herdt Dr. Katie King Contributions to the Success of Low-Income College Students: Internal and Institutional Characteristics

McKinnon E (Moderator: Emily Guyton) [Dr. Megan Isaac]

10:00 am	Meara Waxman Dr. Janet Myers The Truth of the Marriage Plot: Linguistic Double-Voiced Discourse in Four Brontë Novels
10:20 am	Elizabeth A. Ainger Dr. Kathy Lyday <i>With Grace Among Men</i> : The Construction of a Historical Novel
10:40 am	Nicole L. Galante Dr. Megan Isaac A Genre Against Them: Regulating Young Adults Through Literature

McKinnon F (Moderator: Hanna Griesbach) [Dr. Chad Awtrey]

10:00 am	Ashley L. Pritchard Dr. Chad Awtrey Classifying Ramified Polynomials of Degree 2p
10:20 am	Samuel C. Jimenez Dr. Duke Hutchings The Effect of Quick Release and Dwells Time on Encumbered Interaction
10:40 am	Jack M. Hartmann Dr. Megan Squire Understanding the Role of Corporate Participation in Open Source Software Communities

Lakeside 212 (Moderator: Emily Hughes) [Dr. Alfred Simpkin]

10:00 am	Bonnie Bloxom & Emily Cooper Dr. Gregory Haenel The Tale of the Tail: The Rattlesnake's Rattle as an Adaptation due to Natural Selection
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10:20 am	Kamberly L. Terry The Effects of Morphology and Mitochondrial DNA Haplotype on Sprint Speed in a Desert Lizard	Dr. Gregory Haenel
10:40 am	Katherine R. Westover Evolutionary Responses in Copy Number of Kruppel-Associated Box Zinc Finger Proteins: A Test Using Hybrid Lizards	Dr. Gregory Haenel
11:00 am	Grace T. Carter Resurrection of Extinct Retroviruses within the Chimpanzee Genome as a Tool to Combat Viral Infection in Human Populations	Dr. Alfred Simpkin
11:20 am	Keeley W. Collins Analytically Modeling the Genetic Drift of MicroRNA Binding Sites	Dr. Alfred Simpkin

Lakeside 213 (Moderator: Camden Campe) [Dr. Lawrence Garber, Jr.]

10:00 am	Alice Perseval Country-of-Origin Effects: The Case of France	Dr. Lawrence Garber, Jr.
10:20 am	Sophie L. Scharrer The Effect of a Dimorphic Response to a Cute Stimulus on Consumer Perception, Liking, and Purchase Intent	Dr. Lawrence Garber, Jr.
10:40 am	Maxwell Pivonka Social Media Usage in Inside Business-to-Business Lead-Generation Efforts: A Qualitative Analysis	Dr. Nawar Chaker
11:00 am	Alec Bijou Ethical Decision Making: Corporate Leadership in the Wealth Management Industry and Their Ethical Responsibility to Investors	Dr. Jay O'Toole

Lakeside 214 (Moderator: Pearl Sullivan) [Dr. Pablo Celis-Castillo]

10:00 am	Taylor R. Faust Marginalization in Bolivia: The Representation of the Indigenous in También la lluvia and Yvy Maraëy: Tierra sin mal	Dr. Pablo Celis-Castillo
10:20 am	Sofia A. Huster The Representation of Sexual Minorities in La soberbia juventud: An Evaluation of Discrimination in Post-dictatorial Chile	Prof. Pablo Celis-Castillo
10:40 am	Mary Ellen Kempf The Distinct Perspectives of Indigenous Marginalization in Bolivia through the Films También la lluvia and Zona sur	Dr. Pablo Celis-Castillo
11:00 am	Elizabeth S. McDonald The Marginalization of Nicaraguans in Costa Rica as Seen through Princesas Rojas and El Nica	Dr. Pablo Celis-Castillo
11:20 am	Katie A. Schneider Ser cuidadora: mujeres mexicanas en Real Women Have Curves y Como agua para chocolate (Being a Caretaker: Mexican Women in Real Women Have Curves and Como agua para chocolate)	Dr. Pablo Celis-Castillo

Global Commons 103 (Moderator: Victoria Traxler) [Dr. Qian Xu]		
10:00 am	Selina S. Guevara Media Coverage in Colombia: A Content Analysis of New York Times Articles and Original Journalistic Report	Dr. David Bockino
10:20 am	Anna K. Cosentino Using Twitter Sentiment to Advise Municipal Decision Making	Dr. Derek Lackaff
10:40 am	Meagan Gitelman & Alexandra Roat Top Global Internet Leaders Outline Key Challenges for Technology Governance	Prof. Janna Anderson
11:00 am	Lucía Jervis Grunauer Knowledge, Attitude, Practices and Insight of the Children and Adults Who Survived a Natural Disaster	Dr. David Copeland
Moseley 215 (Moderator: Mason Enloe) [Dr. Ariela Marcus-Sells]		
10:00 am	Brianna F. Elder (Mis)Translating Christianity in Africa	Dr. Ariela Marcus-Sells
10:20 am	Joel P. Green From American Apocalypse to American Medina: Black Muslim Theological Responses to Racial Injustice in The United States	Dr. Ariela Marcus-Sells
10:40 am	Kristina J. Meyer Is Faith-Based Community Organizing Still Relevant? How Cultural Shifts are Changing the Conversation	Dr. Rebecca Todd Peters
11:00 am	Sophie R. Zinn Identity, Religion, and Secularism: The Ongoing Danish Debate	Dr. Brian Pennington
Isabella Cannon Room (Moderator: Catherine LoGrande) [Dr. Andrea Sinn]		
10:00 am	Diani M. Teixeira Framing the Immigrant Narrative: How News Media and Immigrants Portray Immigrant Stories in North Carolina and Costa Rica	Dr. Laura Roselle
10:20 am	Krisandra Provencher Indigenous Women and Environmental Movements in Latin America: Exploring the Intersection of Gender and the Environment in Grassroots Participation	Dr. Shayna Mehas
10:40 am	Marta L. Djallela A Return to the Cradle of Mankind: Migration to Ethiopia from 1991 to 2018	Dr. Andrea Sinn
11:00 am	Faith E. James Cultural Exchange in Montagnard Immigrant Families: An Intergenerational Case Study	Dr. Pamela Winfield & Dr. Xiaolin Duan
Inman 112 (Moderator: Hannah Quinlan) [Dr. Tonmoy Islam]		
10:00 am	Carson C. Fawzi The Effects of Dispensaries on Surrounding Real Estate Values	Dr. Tonmoy Islam

10:20 am	Rodrigo Pires An Analysis on the Relationship Between Obesity and Income	Dr. Mark Kurt
10:40 am	Katelyn S. Roache The Effects of Micro-Insurance on the Poor's Ability to Smooth Consumption	Dr. Steve DeLoach
11:00 am	Luz Regina Mendoza The Impact of Village Loan and Savings Associations (VSLAs) on South Sudanese Refugees and Ugandan Citizens in Northern Uganda	Dr. Steve DeLoach
11:20 am	Michaela J. Fogarty Impacts of Contraception on Women's Decision-Making Power in Indonesia	Dr. Steve DeLoach

Yeager Recital Hall (Moderator: Dr. Evan A. Gatti)

10:00 am	Alyssa Caffrey The Samuel H. Kress Collection: World War, Old Masters, and the Legacy of Five & Dime Stores in the American Tradition of Collecting	Dr. Evan A. Gatti
10:20 am	Lindsay Maldari The Politics of Fascist Memory in Contemporary Rome	Dr. Evan A. Gatti
10:40 am	Robyn L. Epstein Slashing Signs: Mary Richardson's Attack on <i>The Rokeby Venus</i> as Semiocasm	Dr. Kirstin Ringelberg
11:00 am	Jaclyn A. Kanter Creating Empathy: How Sensory Stimulation in Theatre Advances Audience Understanding of Holocaust Historiography	Dr. Susanne Shawyer
11:20 am	Sara Wasserman Using Collaborative Theatre Techniques to Shape Perceptions of Inclusivity in Fraternity and Sorority Life at Elon	Dr. Susanne Shawyer

Koenigsberger Learning Center 127 Carret Essay Contest (Moderator: Dr. Cassandra Kircher)

10:00 am	Malia Takei Separate and Unequal: Housing Segregation and the Correlation with Unequal Education and Opportunities within the United States' Public Education System	1 st Place
10:00 am	Naomi Perry Through Every Legal Means: How Education Discourse Thwarts Progress	2 nd Place
10:00 am	Ethan Porter Public Schools and Socioeconomic Status	3 rd Place

Oral Presentation Session II (12:30pm-2:10pm)		
McKinnon D (Moderator: Jessica Burchett) [Dr. L. Kimberly Epting]		
12:30 pm	Madeline G. Davis The Effect of Linguistic Framing of Feminism on Reader Reaction to News Headlines	Dr. L. Kimberly Epting
12:50 pm	Laura E. Bernstein Age Differences in Autobiographical Memory	Dr. Amy Overman
1:10 pm	Johanna M. Hilpuesch Grapheme-Color Synesthesia and Word Search Performance	Dr. Mathew H. Gendle
1:30 pm	Emma C. Muscari Help-Seeking for Mental Health Concerns: The Role of Partner Influence	Dr. CJ Fleming
1:50 pm	Betsy H. Albritton Construction of an Assessment Center for Entry-Level Professionals	Dr. Chris Leupold
McKinnon E (Moderator: Nicole Galante) [Dr. Janet Warman]		
12:30 pm	Mary E. Emmerling "I Turn My Face in Silence to the Wall": The Intra-Textuality of Christina Rossetti's <i>Goblin Market and Other Poems</i>	Dr. Rosemary Haskell
12:50 pm	Natalia L. Conte Thinking Like a Feminist: Persona Poems of Linda Lovelace, Simone de Beauvoir, and More	Dr. Janet Warman
1:10 pm	Peter J. Connelly Understanding Character through a Hybrid Genre	Dr. Cassandra Kircher
McKinnon F (Moderator: John Post) [Dr. Kathryn Matera]		
12:30 pm	Sarah A. Brown The Aggregation of Amyloid Beta and Insulin Peptides	Dr. Kathryn Matera
12:50 pm	Elizabeth A. Chapman The Stabilization of A β Oligomers Using Serotonin, Indole, and Catechol and Their Effects on DNA	Dr. Kathryn Matera
1:10 pm	Bailey W. Gilmore The Effects of Cholesterol on Amyloid Beta Aggregation in Alzheimer's Disease	Dr. Kathryn Matera
1:30 pm	Nicholas G. Ciolkowski Synthesis, Characterization, and Bioactivity of Coordinate Vanadium Complexes as Antibiotic Compounds	Dr. Jennifer Dabrowski
Lakeside 212 (Moderator: Emma Ebright) [Dr. Jen Hamel]		
12:30 pm	Anna M. Corsiglia Northern Mockingbirds' Bio-Acoustic Selection of Model Frog Species	Dr. Dave Gammon

12:50 pm	Alina Iwan, Ciara Kernan, Amber Litterer & Hannah ter Hofstede Studying the Functions and Contexts of Vibrational Communication in Neotropical katydids	Dr. Jen Hamel
1:10 pm	Sydney Solomon The Impact of Early Adult Diet on the Reproductive Development of Two Hybridizing Species of Insect	Dr. Jen Hamel
1:30 pm	Connor D. Whiffen Copulation Control in the Squash Bug (<i>Anasa tristis</i>)	Dr. Jen Hamel
1:50 pm	Madeline J. Turnau Ice Storm Effects on Secondary Succession in EUF	Dr. David Vandermast

Lakeside 213 (Moderator: Grace Ring) [Dr. Brian Lyons]

12:30 pm	Annik B. Westermann Learning from Machines: A Closer Look at Supply Chain Agility in the Era of The Internet of Things	Dr. Haya Ajjan
12:50 pm	Yann Martail The Future of A.I. and Its Implications Regarding People's Behavior towards This Emerging Technology	Dr. Jay O'Toole
1:10 pm	Tiphaine Soller How Strategic Positioning Influences the Commercial Success of Creative Performances	Dr. Jay O'Toole
1:30 pm	Charlotte Jaecker Understanding Job-Hopping across Cultures and Personality Traits	Dr. Robert Moorman
1:50 pm	Jenna E. Bayer Reexamining the Demand for Human Resource Certification in the United States	Dr. Brian Lyons

Lakeside 214 (Moderator: Madison Aycock) [Dr. Kristina Meinking]

12:30 pm	Lucy Crenshaw Gods, Myths, and Men: Tensions between Philosophy and Religion in Cicero	Dr. Kristina Meinking
12:50 pm	Monroe E. Dziersk Ovid's Tristia: Exploring Ovidian Exile Poetry	Dr. Kristina Meinking
1:10 pm	Emily C. Ternent Revolutionary Women in the Ancient World: The Memorialization of Powerful Women during the Roman Empire	Dr. Kristina Meinking
1:30 pm	Kyle D. Thomas Imperial Ambitions: The Manufactured Inheritance from Rome to Britain	Dr. Kristina Meinking
1:50 pm	Katherine R. Westover The Functional Roles of Zeus and Jupiter: Differences in Societal Needs and Values	Dr. Kristina Meinking

Global Commons 103 (Moderator: Alexander Toma) [Prof. Lee Bush]		
12:30 pm	Stefanie R. Milovic	Prof. Lee Bush Society-Driven Responsibility: Corporations beyond CSR
12:50 pm	Rebecca C. Foley	Dr. Barbara Miller Gaither Speaking Out: Exploring Alignment between Stated Corporate Values and Corporate Advocacy on Environmental and Social Issues
1:10 pm	Matthew R. Simmons	Prof. Nicole Triche Examining the Impact of Systematic Racism on Expressions of Masculinity in Hip-Hop Music Videos
Moseley 215 (Moderator: Griffin Barriss) [Dr. Brian Pennington] <u>Symposium I: Rising to the Challenge: South Asian Communities and Globalization</u>		
12:30 pm	Bonnie S. Bloxom	Prof. Amanda Tapler Examining the Jamkhed Model: A Collaborative, Comparative Study of Hypertension in Rural Indian Villages with the Comprehensive Rural Health Project
12:50 pm	Styrling Rohr	Dr. Mussa Idris Devotional Music and Multifaith Encounter in a North Carolina Sikh Community
1:10 pm	Kathryn Gerry	Dr. Amy L. Allocco Migration and South India's Shifting Landscapes: Social and Religious Change in Kerala
1:30 pm	Sonya Walker	Dr. Amy L. Allocco Discrimination and Profiling: A Student Response
1:40 pm	Erin T. Jenkins	Dr. Jason Kirk US Intervention in Pakistan: Political Moves that Shaped Pakistan's Religious History
Isabella Cannon Room (Moderator: Dr. Jeffrey Carpenter)		
12:30 pm	Emily T. Ford	Dr. Stephen Byrd Reflective Writing in Pre-service Teachers: Habits, Techniques, and Effectiveness
12:50 pm	Rachel E. Kowalewski	Dr. Julie Justice "My Hand Feels Relaxed": How Children Use Fidget Spinners to Manage Activity and Attention in a Play-Based Environment
1:10 pm	Michalene A. Lee	Dr. Jeffrey Carpenter How and Why Educators Use Instagram
1:30 pm	Courtney N. Kobos	Dr. Jennifer Eidum Looking Beyond the Classroom: Responding to Educator Needs in Linguistically Diverse Schools, A Leadership Prize Project

Inman 112 (Moderator: Jacob Stern) [Dr. Katy Rouse]		
12:30 pm	Judah Brown I The Impact of Political Protests on National Football League Television Ratings	Dr. Brandon Sheridan
12:50 pm	Jacob K. Crouse The Impact of Water Quality on the Value and Size of the Blue Crab Fishery in the Chesapeake Bay	Dr. Brooks Depro
1:10 pm	Camille M. Kelley The Gender Gap in STEM Fields: Female STEM Student Attrition	Dr. Katy Rouse
1:30 pm	Erin E. Kelly The Effects of Mental Health on Academic Achievement of College Students	Dr. Katy Rouse
1:50 pm	Morgan G. Valeo The Effects of Divorce on Parental Investment and Children's Later Life Outcomes	Dr. Katy Rouse
Yeager Recital Hall (Moderator: Cora Palfy)		
12:30 pm	Charlie Freedman Ugly Indie: The Function of Imperfection	Dr. Cora Palfy
12:50 pm	Kameron C. Williams Hearing Motion Pictures: How Production Effects and Musical Elements Create a Realistic Experience within Movies	Dr. Cora Palfy
1:10 pm	Rachel C. Hopkins Sounds of the Screen: Discovering, Analyzing, and Applying Trends in Film Score from 1985-2017	Prof. Clay Stevenson
1:30 pm	Julianne M. Papadopoulos Searching for Greek Identity: Rebetiko's Musical Expression of an Evolving Culture	Dr. Victoria Fischer Faw

Oral Presentation Session III (2:20pm-4:00pm)		
McKinnon D (Moderator: Emily Klevan) [Dr. Caroline Ketcham]		
2:20 pm	Katherine E. Arbogast	Dr. Caroline Ketcham & Dr. Eric Hall The Relationship Between Team Climate Factors, Sport Type, and Concussion Reporting Intentions in Collegiate Student-Athletes
2:40 pm	Morgan T. Schmidt	Dr. Caroline Ketcham & Dr. Eric Hall The Relationship Between Academic Performance, Academic Confidence, and Concussion History in Collegiate Student Athletes
3:00 pm	Christopher R. Riegner	Dr. Eric Hall & Dr. Caroline Ketcham Using Concussion Symptoms as a Proxy for Mental Health: Baseline Concussion Symptoms May Be Predictive of Depressive Symptoms
3:20 pm	Hope B. Koene	Dr. Caroline Ketcham Parent Perspectives of Health Care Barriers and Social Supports for their Children with Disabilities within a University Community Context
McKinnon E (Moderator: Bailey Numbers) [Dr. Jason Husser]		
2:20 pm	Noah T. Kutner & Kaitlyn O'Donnell	Dr. Laura Roselle RT Online Coverage of US Election 2016: Analyzing Strategic Narratives
2:40 pm	Annie Waddell & Louisa M. Sholar	Dr. Laura Roselle Coverage of Hillary Clinton in RT during the 2016 Election
3:00 pm	Joseph L. Rodri	Dr. Jason Husser Political Polarization and Reddit
3:20 pm	Mary Ellen Kempf	Dr. Carrie Eaves Where Are the Women? An Intersectional Analysis of Female Representation in State Legislatures
3:40 pm	Jacob P. Hayward	Dr. Susan Camilleri The Role of State Legislatures' Partisan Makeup in Determining Healthcare Funding for Prisoners
McKinnon F (Moderator: Sydney Thornton) [Dr. Justin Clar]		
2:20 pm	Joel P. Harvey	Dr. Joel Karty Why Are Carboxylic Acids Stronger Acids than Alcohols? Contributions by Resonance and Inductive Effects
2:40 pm	Avery C. Hatch	Dr. Justin Clar Transformation of Metal Oxide Nanoparticles in Surface Coatings: Hazards of Inhalation and Ingestion during Application

3:00 pm	Annie Yang Iron Welding Fumes: Human Health Consequences and Potential Beneficial Reuse	Dr. Justin Clar
3:20 pm	Michael Dryzer Sustainable Sanitation in the Developing World: Deactivating Parasitic Worm Eggs in Wastewater Using Electroporation	Dr. Scott Wolter

Lakeside 212 (Moderator: John McGinley) [Dr. Katherine Johnson]

2:20 pm	Maya C. Aboutanos Investigating the Relationship between Spirituality and Health: A Case Study on a Holistic Health Care Facility in North Carolina's Piedmont Region	Dr. Katherine Johnson
2:40 pm	Sarra Eddahiri A Leadership Prize Project: Mental Health Needs and Perceptions among College-Age Students in Post-Revolution Tunisia	Dr. Katherine Johnson
3:00 pm	Sofia A. Huster Traveling Healthy: Elon University Undergraduate Students' Pre-Travel Health Behaviors and Health Outcomes Regarding Study Abroad	Dr. Katherine Johnson
3:20 pm	Stephanie B. Ntim The Art of Malaria Education	Dr. Katherine Johnson
3:40 pm	Taylor D. Jones "The Doctor Said It Was Fine and to Vaccinate Her; So, I Trusted Her Word and Did It, But I'm Still Afraid": The Role of Triadic Communication in Understanding Human Papillomavirus Vaccination in Latina Adolescents	Dr. Stephanie Baker

Lakeside 213 (Moderator: Dr. Carmen Monico)

2:20 pm	Mariatu I. Okonofua In Search of Equality: Identity Formation and Activism in College-Aged Women	Dr. Raj Ghoshal
2:40 pm	Alexandra A. Marek Caseworkers' Perspectives of the Accessibility and Effectiveness of Services for Biological Parents in the Foster Care System	Dr. Bud Warner
3:00 pm	David M. Duncan The Deportation Threat and It's Health Impact on Hispanic Immigrant College Students: A Leadership Prize Project	Dr. Carmen Monico

Lakeside 214 (Moderator: Claire Gerkins & Laura Clarkson) [Dr. Olivia Choplin]

2:20 pm	Isabel R. Treanor Modernizing Magical Realism	Dr. Ketevan Kupatadze
2:40 pm	Ally Bolton An Analysis of Maternal Relationships in Kim Thúy	Dr. Sarah Glasco & Olivia Choplin

3:00 pm	Martina Racioppi Le paradoxe du rôle de l'école dans l'école perdue de Tahar Ben Jelloun : Est-ce qu'on peut gagner et perdre en même temps?	Dr. Sarah Glasco
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Global Commons 103 (Moderator: Carter Martin) [Dr. Tony Weaver]		
2:20 pm	M. Serena Archer A Qualitative Analysis of the Intersectional Socialization of NCAA Division I Student-Athletes Across Diverse Identities	Dr. Tony Weaver
2:40 pm	Daniel Schiff A New Comprehensive Offensive Measurement: Total Achieved Bases (TABS) as an Evaluation Tool in Professional Baseball	Dr. Mark Cryan
3:00 pm	Brendan M. Thiry Examination of Administration Positions Within NCAA Division I Athletics Institutions: How Can Student-Athlete Well-Being Be Prioritized?	Dr. Tony Weaver

Moseley 215 (Moderator: Prof. Samantha DiRosa) <u>Symposium II: Sustainability across the Disciplines and in Community-Based Partnerships</u>		
2:20 pm	Charlotte F. Murphy Mapping the Relationship Between Land and Food Through Soil	Prof. Samantha DiRosa
2:40 pm	Kylie Roehrle Analysis of Tree Mortality in Carbon Offset Plantings in Central NC	Dr. David Vandermast
3:00 pm	Collin Murray A Conceptual Model to Understand Environmentally Responsible Initiatives by North American Sport Teams and Perceptions of Sport Fans: The Belief-Attitude-Intention Hierarch Approach	Dr. Young Do Kim
3:20 pm	Mirella F. Cisneros Perez Beyond Science in Environmental Education: Examining the Effects of Teaching Math Outside	Dr. Scott Morrison

Isabella Cannon Room (Moderator: Nicole Kister) [Prof. Erin Hone]		
2:20 pm	Nathan W. Hunnicutt Beyond Interconnected Sustainability Education: A Case Study of NC Green Schools	Dr. Scott Morrison
2:40 pm	Molly C. Kearns Implications for Elementary Educators' Abilities to Accurately Self-Evaluate Their Mathematics Teaching Practices in Relation to Math Anxiety Levels	Prof. Erin Hone
3:00 pm	Kristen L. O'Neill Reading to Succeed: An Examination of the Interests and Engagement of Struggling Pre-Adolescent Readers	Prof. Marna Winter

Inman 112 (Moderator: Dr. Margarita Kaprielyan)	
2:20 pm	Hannah M. Quinlan Dr. Dr. Vitaliy Strohush The Relationship Between Education, Experience, and Political Productivity
2:40 pm	Anthony J. Potenza Dr. Margarita Kaprielyan Effect of JOBS Act on Biotechnology & Pharmaceutical Sector IPOs
3:00 pm	Zachary J. Lahey Dr. Adam Aiken A Genetic Algorithmic Approach to Statistical Arbitrage Trading Strategies
3:20 pm	Clarence Mouro Dr. Kate Upton The Impact of Venture Capital Funding Patterns on Innovation and Success
3:40 pm	Michael Dwyer Dr. Kristin Roland Are Accounting Misstatements Contagious?: An Examination of Accounting Violation Trends in the Manufacturing Industry
SURF Reception 4:30-5:30 First floor atrium of the Great Hall, Global Commons	

Symposium: Rising to the Challenge: South Asian Communities and Globalization

This symposium features student members of the South Asia Research Group at Elon (SARGE), an informal association of students and faculty members doing research in or about South Asia or South Asian communities in the diaspora. SARGE is providing student-generated programs for peer and faculty mentoring on the practical skills of field research in South Asia and on project conception and development. This symposium considers how various communities from a set of South Asian countries are contending with the social challenges posed by accelerating and sustained contact with other cultures and political systems as a result of globalization. These projects examine cultural flows that are altering South Asian lifestyles, self-understanding, and self-representation. While the influx of goods and ideas from such places as the Gulf states engender more conservative forms of Islam in South India, South Asian Muslims and Sikhs in the US devise strategies for combatting the stereotypes that mark them as threats. In other places such as central India we can see how globalization has public health implications, as changing diets and labor patterns lead to rises in hypertension that are, in turn, addressed through innovative public health interventions. The student projects that this symposium draws from represent a range of South Asian topics—devotional music, village health workers, racial profiling by airlines, mosque architectural styles in South India, and religious minorities in Pakistan. They represent methodologies employed in a variety of disciplines—Anthropology, Public Health, Political Science, Journalism, and Religious Studies. Together they highlight distinctive patterns in globalizing South Asia that set this region apart from others.



Examining the Jamkhed Model: A Collaborative, Comparative Study of Hypertension in Rural Indian Villages with the Comprehensive Rural Health Project

Bonnie S. Bloxom (Professor Amanda Tapler) Department of Public Health Studies

Cardiovascular disease (CVD) is the leading cause of mortality in India with hypertension being one of its most significant risk factors. Over one-third of India's population has hypertension and the burden of CVD in rural India is exacerbated by limited access to preventative and curative services. This collaborative research project was conducted in the state of Maharashtra, India with the Comprehensive Rural Health Project (CRHP), a non-profit organization utilizing an evidence-based primary healthcare approach, called the Jamkhed Model. This model includes community participation, empowerment, and integration of Village Health Workers (VHW) to initiate social change and improve health outcomes. Three villages utilizing VHWs and three control villages within Maharashtra were randomly selected to participate. Approximately equal number of participants in each village type, 40-70 years, with hypertension were randomly sampled. The sample size of 132 was calculated to attain 85% statistical power, to determine whether or not hypertension was managed in each village type, at the 5% significance level. A modified version of the World Health Organization's STEPS survey was utilized to capture three blood pressure readings and hypertension-related knowledge and behaviors. Furthermore, 10 focus groups and 16 semi-structured interviews were conducted to further evaluate the role of VHWs on hypertension behavior and management. There are statistically significant differences in the mean systolic blood pressure between the intervention villages ($M = 140.3$) and control villages ($M = 143.1$, $p = .01$) and proportion of stage 1 and stage 2 hypertension ($p = .02$). Additionally, the presence of a VHW increased the likelihood of having well-managed hypertension (OR 2.07, 95% CI: 1.13-3.78; $p = .01$). Intervention villagers were more likely to discuss blood pressure with a VHW regularly and receive lifestyle advice about hypertension in the past three months as compared to control villages ($p < .01$). Qualitative research findings provide evidence about the high levels of health literacy and health-related self efficacy among those living in intervention villages and reveal how VHWs empower individuals by providing hypertension education and support. In conclusion, these results indicate that VHWs increase villagers' awareness of lifestyle behaviors associated with hypertension and support management of hypertension.

Migration and South India's Shifting Landscapes: Social and Religious Change in Kerala

Kathryn B. Gerry (Dr. Amy L. Allocco) Department of Religious Studies

This ethnographic research project explores the connections and flows created by worker migration from the state of Kerala, India to the Gulf region. It examines how outmigration affects relationships between and among religious communities in Kerala and manifests in changes to styles of dress, the architecture of religious sites, and gender and other social roles and relationships. At its broadest level the project focuses on how more conservative Gulf ideologies flow back to Kerala along with remittances: whether these ideas travel back to South India along with migrating workers or are transmitted virtually via Skype calls and WhatsApp messages, their effects are visible and significant. More specifically, the project asks how the phenomena of worker migration influences religious practices, both in the Gulf and back at home in Kerala, and investigates how it might change the nature of interreligious encounter itself. The

project will draw on in-person interviews and participant-observation in Kerala as well as virtual interviews with Gulf workers and will analyze how these many changes – in dress and architectural styles, in gender roles and relations, and in social and religious communities – are understood by migrants, their families, and their communities. It will investigate these dynamics and realities through five weeks of participant-observation and interviews with the families and communities of migrant workers in Kerala as well as virtual interviews with workers located in the Gulf region in the summer of 2019. Currently, it is grounded in an extensive literature review focused on Indian migration and migrant experiences, flows between South India and the Gulf, the social and economic history of Kerala and its contemporary status, religious dress and gender, and the traditional South Indian architectural style of religious sites.

US Intervention in Pakistan: Political Moves that Shaped Pakistan's Religious History

Erin T. Jenkins (Dr. Jason Kirk) Department of Political Science and Policy Studies

I will be one of two student respondents to the symposium. In this response, I will introduce my research project on US-Pakistan relations in the Obama era that I am just beginning this semester and then pose a few questions about South Asia or research on South Asian topics to the presenters based on the early insights I have gained from my preliminary investigations. My project will examine the state of religious tensions in Pakistan by examining US policies under the Obama administration in order to explain the current relationship between the two nations. Pakistan's history involving treatment of religious minorities has dominated politics in the nation since its founding. Pakistan has been a strategic ally of the US for decades; however, relations have often been strained due to the conflicting cultural and political ideologies of the two nations as well as a substantial lack of mutual trust. Scholars have investigated the state of religious tensions in Pakistan as well as the impact of US intervention, but there is limited work that attempts to draw direct connections between the two. I seek to fill the gap in the literature using process tracing (a method that works backwards from an outcome to find the contributing factors) and supplementary interviews to uncover the how the current state of US-Pakistan relations was influenced by Obama-era policies that disregarded the oppression of religious minorities in Pakistan. With respect to the research my senior colleagues are presenting, my work prompts me to consider the potential implications of US policies on other countries in the South Asian region and encourages me to wonder how other religious minority groups in their research areas have been similarly (or dissimilarly) impacted by US actions.

Devotional Music and Multifaith Encounter in a North Carolina Sikh Community

Styrling A. Rohr (Dr. Mussa Idris) Department of Sociology and Anthropology

Sikhism is a monotheistic religion founded on principles of equality, devotion, and courage that originated in Northern India. Sikh services today, both in India and in diaspora, mostly consist of *keertan*, singing and reciting the scripture in hymns. Drawing on nearly two years of ethnographic research with a Sikh community in North Carolina, this project investigates the role of Sikh sacred music in religious experience, Sikh-American identity, and the ways interfaith concerns impact everyday life. In contrast to much of the academic literature, which suggests that Sikh *keertan* functions as a pragmatic tool to teach Sikhs about their religion and culture, I found that *keertan* functions just as much as an expressive religious experience than as a tool.

Additionally, I found that Sikhs in North Carolina, as part of a minority religious community, are especially concerned with issues of self-representation and educating non-Sikhs about their tradition, and that the interfaith themes which guided Sikhism's initial formation continue to inform this community. This research directly engages with a local religious ethnic group that is not often studied academically and not often recognized by Americans as distinct. Sikhism remains especially understudied in the Southeast. The most concrete rationale for this research, however, lies in its capacity to foster relationships between a sidelined, local community and Elon's academic community as well as more broadly among Sikhs and non-Sikhs. By demonstrating Sikh hospitality, illustrating the complexity of Sikh practices and devotional music, and sharing the stories and opinions of Sikh people, this research advances a larger goal of promoting a more nuanced, welcoming, and positive view of Sikhs in America today.

Discrimination and Profiling: A Student Response

Sonya A. Walker (Dr. Amy L. Allocco) Department of Religious Studies

I will be one of two student respondents to the SURF Symposium titled, "Rising to the Challenge: South Asian Communities and Globalization." In this response, I will introduce my research project titled, "Islamophobia and Sikh Misidentification in the American Airline Industry" that I am just beginning this semester. I will then pose questions about conducting research on South Asian topics to the presenters based on the early insights I have gained from my preliminary investigations. My project employs a survey methodology to examine profiling policies and practices in US airlines since 9/11. It aims to bring together the spectrum of perspectives on airline practices by airline employees and understand the airline industry's perception of religious traditions based on their policy documents. This research has introduced me to literature on discrimination and profiling. On that basis, I will initiate a dialogue with the other presenters about whether and how the South Asian communities they have studied navigate systematic discrimination and about the strategies they adopt for responding to widespread misperception of their traditions. My response to this panel will also be informed by background information from my studies on the roots of Islamophobia in the United States as well as the historical conflation of race, religion and progress.

Sustainability across the Disciplines and in Community-Based Partnerships

The term “sustainability” is often popularly aligned with the study of environment from the perspective of science, with such issues as deforestation, pollution, climate change, and wildlife habitat loss at the forefront of discussions. However, the United Nations has identified three pillars of sustainability, which include the social and economic dimensions, alongside the environmental. The UN’s 17 Sustainable Development Goals, considered the blueprint to 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, good health and well-being, climate action, quality life on land, responsible production and consumption, and global partnership. Each student project in this session diversely connects to at least two or more UN Sustainable Development Goals. “Mapping the Relationship Between Land and Food Through Soil” uses metaphor and narrative to explore the regenerative practices of Cane Creek Farm in Saxapahaw to underscore the importance of local food systems and soil health for nutrient rich food. “Beyond Science in Environmental Education: Investigating the Effects of Teaching Math Outside” looks at the potential for place-based mathematics education to counter the negative effects on children’s mental and emotional health derived from spending less time outside and in nature. “Analysis of Tree Mortality in Carbon Offset Plantings in Central NC” examines the process of carbon sequestration and its effectiveness in combating climate change through studying Urban Offsets’ tree planting sites in Durham and Greensboro. “A Conceptual Model to Understand Environmentally Responsible Initiatives by North American Sport Teams and Perceptions of Sport Fans: The Belief-Attitude-Intention Hierarch Approach” examines the effect of environmentally responsible initiatives used by sport organizations on sport consumer behavior in order to expand the “going green movement.” This symposium unites the humanities, social, and physical sciences, and in reflecting many of the UN’s Sustainable Development goals, also contributes to the complex discussions and necessary education that we need to do around sustainability as a broader, multidisciplinary lens and cultural principle and practice. Furthermore, a unifying factor within each student project is the connection to community partners and the benefit to those outside the walls of Elon, which encapsulates the final UN Sustainable Development Goal of partnership between institutional and public sectors.



Mapping the Relationship Between Land and Food Through Soil

Charlotte F. Murphy (Professor Samantha DiRosa) Department of Art and Art History

Soil makes up the earth upon which our food is grown, and its impact goes beyond the physical land to influence the food we find on our dinner plate. In my work, I seek to bring attention and contemplation to soil as the foundational element in the sustainable food process. By incorporating soil as a paint medium, I acknowledge its presence in the various stages of the food process: the beginning, which is the physical farmland, and the end, being the sustenance produced from the soil. In painting detailed portraits of food (that which is produced from the farm and that which is part of the farm animals' diet) and maps of the farm land at Cane Creek Farm in Saxapahaw (where I gathered the physical soil I utilize as paint), I enable the viewer to consider the relationship between a place (represented by the map) and a food product (represented by the meat). A conversation about this relationship occurs a number of ways: through close proximity of the pieces in the display and through visual similarities between paintings, such as line quality and shape. Although I do not seek to imply that a map of the land and a portrait of bacon are the same through their visual similarities, I aim to convey the way that soil connects these components of the food process. In short, my paintings act as maps: by referencing the specificity of place—the local farm—and its relationship with the resulting food item. I choose to employ the concept of mapping as a way to mediate the disjointed view of the larger food system. In summary, I underscore the value of sustainable food systems, such as the foodshed at Cane Creek Farm, which act in opposition to the identity-less and irreverent processes of the factory farm industry. Given that maps are commonly used as tools of navigation, location, and identification, by implementing this concept in my paintings, I help the viewer traverse the underlying foundation that soil creates between farm and fork.

A Conceptual Model to Understand Environmentally Responsible Initiatives by North American Sport Teams and Perceptions of Sport Fans: The Belief-Attitude-Intention Hierarchy Approach

Collin W. Murray (Dr. Young Do Kim) Department of Sport Management

In recent years, “Going green movement has gained momentum in America society” (McCullough & Cunningham, 2010, p. 349). Indeed, North American sport organizations at professional and collegiate levels are actively involved in a variety of environmentally responsible initiatives (ERIs). Sport organizations make the best use of the influential culture and market of sports to promote a sustainable mindset and behavior among stakeholders. However, little is known about the underlying mechanisms of sport fan behavior responding to the ERIs. Given this gap in the literature, the purpose of this study was to develop a conceptual model that outlined the effects of ERIs implemented by sport organizations on sport consumer behavior. In particular, we applied a belief-attitude-intention hierarchy model proposed by Madrigal (2001) to explain the process of how sport consumers' beliefs of a sport team's ERI investment lead to their pro-environmental behavior intentions. The proposed conceptual model articulated following three main relationships: (a) Sport teams' ERIs are positioned to positively influence sport fans' attitude toward sport organizations; (b) sport fans who hold favorable attitude toward the sport teams' ERIs are predicted to participate in pro-environmental behaviors; and (c) attitude plays a key mediating role between the sport fans' beliefs of the sport teams' ERI

investment and their pro-environmental behavior intentions. The findings from this current study encourage more sport organizations to accelerate “going green movement” to benefit not only themselves but also our communities. The implications of these findings indicate that favorable beliefs about the benefits from pro-environmental behaviors and initiatives have a very positive impact on the community and overall sport consumer behavior. Furthermore, this has been linked positively to the ability that sport organizations have on consumers’ beliefs in regards to the education of the benefits of the “going green movement”.

Beyond Science in Environmental Education: Examining the Effects of Teaching Math Outside

Mirella F. Cisneros Perez (Dr. Scott Morrison) Department of Education and Wellness

According to Louv (2005), children are spending less time outside compared to previous generations. One of the purposes of environmental education is to disrupt this trend (Sobel, 2012). As a future math teacher, I am interested in the effects of teaching math outside, and specifically how it impacts students’ learning of mathematics and their connection to nature. Studies show that spending time outside has numerous cognitive, psychological, and emotional benefits (Atchley, Strayer, & Atchley, 2012; Berman, Jonides, & Kaplan, 2008; Berto, 2005; Li, 2010; Faber Taylor & Kuo, 2009). Research has also shown that incorporating mathematics in real-life environmental situations helps students understand abstract mathematical concepts (American Association, 1989; McBride & Silverman, 1991). Recently, the National Council of Teachers of Mathematics (NCTM) published an article about kindergarteners learning math in natural spaces (McLennan, 2018). The students used their curiosity about the environment to observe and wonder about the mathematics surrounding them. My research project seeks to extend this kind of learning to other age groups. I conducted a case study (Merriam, 2009) with over 40 middle grades students at three schools in central North Carolina. My research questions were as follows: *How connected do middle school students feel toward nature? What do they think of going outside for academic purposes during the school day? More specifically, what do middle school students think about learning math outside?* All participants completed a survey that included demographic information and modified questions from the Nature Related Scale (Nisbet, Zelenski, & Murphy, 2008). Participants were interviewed before and after a series of at least three math lessons that occurred outside. Analysis of the data suggest that students respond favorably to learning math outside, with most reporting that they are able to focus more easily and understand math concepts more deeply. Conclusions from this study will be of interest to teachers and teacher educators seeking to integrate math and environmental education.

Analysis of Tree Mortality in Carbon Offset Plantings in Central NC

Kylie E. Roehrle (Dr. David Vandermaast) Department of Biology

Between 2016-2017, over 1,000 trees were planted in North Carolina’s Piedmont physiographic region as part of three carbon offset programs: Delta Airlines (Delta), Duke University (W&G), and Elon University (Price Park). Over the next 40 years these trees will sequester carbon, after which the sequestered carbon can be sold or used as an offset credit. A key factor influencing total carbon sequestration is sapling mortality. The purpose of this research is to conduct a site verification of each tree in order to determine the first-year mortality rate of the trees in each

planting, and to estimate the amount of carbon likely to be sequestered after 40 years. Verification was conducted per the Duke Carbon Offset Initiative (DCOI) protocol. Urban plantings such as these have an expected mortality rate of 3-8% after forty years. We hypothesized that the observed mortality rate after one year would fall below this range. Our results showed that there were significant numbers of missing or misidentified trees for the Delta project. Furthermore, we found that the mortality rates for trees planted in each project were: Delta 21%, W&G 7.1%, and Price Park 5.9%. As a result of the excessive mortality rate of the Delta project, the project could not be validated for carbon offset purposes. Across all sites, we identified lack of control over planting techniques, drought, and buck antler rubs as significant causes of mortality. We calculated that in 40 years 278 MtCO₂e is expected to be sequestered in Price Park, 447.91 MtCO₂e in the W&G project and 6,545.9 MtCO₂e in the Delta project. Our hypothesis was not supported by our results because the mortality rates at each site exceeded the 3% threshold in all projects. Our research into patterns of mortality and their effect on carbon sequestration will help to guide future sequestration projects in the Piedmont physiographic region.

Abstracts by Department/Program

Accounting

Are Accounting Misstatements Contagious?: An Examination of Accounting Violation Trends in the Manufacturing Industry

Michael J. Dwyer (Dr. Kristin Roland) Department of Accounting

To enhance the comparability of their financial reports, it is common for firms within an industry to be consistent in their application of generally accepted accounting principles. The purpose of this study, however, is to examine whether a similar pattern exists with respect to accounting misstatements. The Securities and Exchange Commission (SEC) issues an Accounting and Auditing Enforcement Release (AAER) when a public company is found guilty of violating federal security laws, including the misuse or manipulation of accounting procedures. It is not uncommon for an AAER to be issued several quarters or years after the initial misuse of accounting procedures, leading to an extended period of misstated financial information. This lag provides a unique setting to test whether there is a discernable contagion effect within industries related to specific types of accounting misstatements. Said differently, we seek to determine whether there is a trickle-down effect within the manufacturing industry in which larger firms implement a questionable accounting practice which is then adopted by smaller firms or whether the opposite occurs. This research question is important because if violation trends within an industry are apparent, the SEC may use this information to identify additional accounting violations within an industry in a more efficient manner. While there is existing research into AAERs, we are unaware of research that seeks to identify contagion effects in a particular industry. Using a dataset compiled by Dechow, Ge, Larson, and Sloan (2010), we focused on violations occurring in the period 2005-2013 and grouped these companies by their industry. We find evidence that the manufacturing industry has the largest number of AAERs related to financial misstatements. Using the total assets of a company in the quarter before the initial misstatement, we grouped firms into large and small firm groups. Using the sample of 51 AAERs issued to firms in the manufacturing industry, we find no evidence of a predictable contagion effect going from either small-to-large or large-to-small firms; however, our research provides a jumping off point with which to continue investigation into AAERs by industry.

Art & Art History

The Samuel H. Kress Collection: World War, Old Masters, and the Legacy of Five & Dime Stores in the American Tradition of Collecting

Alyssa R. Caffrey (Dr. Evan Gatti) Department of Art and Art History

Popularly known through films and movies such as *Monuments Men* (2014, George Clooney) and *Woman in Gold* (2014, Simon Curtis), art played an important role during World War II. The need for liquidity in Europe spurred people to sell off assets, such as paintings. Others lost their collections to looters, including the highly-organized Nazi elite. (Edsel and Bret, 2009).

At this same time, the twentieth-century American collector Samuel H. Kress began amassing his own art collection. Kress' legacy, and the history of his collections has been portrayed as an American rags-to-riches story. The common portrayal of Kress is an oversimplification of a collector who lived during turbulent times in the art market. After he collected Italian works, he donated them to museums across America. The common narrative is Kress used his newfound wealth to allow people from across the United States access to European artwork, or what some called "a gift to America" (Ishikawa et al, 1994).

I argue that Kress' "gift to America" is only half of the collection's story. The full story cannot be told without examining the concurrent looting of Europe at this time period, which allowed many of these works to transition ownership into the hands of eager American collectors. Without these unique set of circumstances, it is unlikely American collectors would have been able to amass such vast and rich collections at their asking prices.

To construct a more historically accurate narrative, I will use ten works of art from the North Carolina Museum of Art as case studies. I selected these works because they have questionable provenance and connections to a specific art dealer, Contini-Bonacossi. Additionally, I will use Kress Collection catalogues from a variety of time periods and institutions to construct how that narrative of Samuel H. Kress has changed over the years as museums emphasis the need to research provenance of works exchanged during World War II. My goal is for viewers of the Kress collection to see it more fully and as representative of the contexts of this contentious time period, telling a story of both generosity and a reflection of the tumultuous art market.

Slashing Signs: Mary Richardson's Attack on *The Rokeby Venus* as Semioclasm

Robyn Epstein (Dr. Kirstin Ringelberg) Department of Art and Art History

When art is the victim of violence the work of art itself isn't the only thing under attack. Acts of violence against art occur in two simultaneous actions: an attack on the physical art object and an attack on the icon, symbol, or sign it represents. This paper examines Mary Richardson's 1914 slashing of *The Rokeby Venus* (1647-51) painted by Diego Velázquez. Using Charles Sander Peirce's semiotic theory as my main methodology, I argue that Mary Richardson's attack should not and cannot be categorized as iconoclasm or vandalism. This research aims to examine and challenge the ways in which the destruction of art is discussed in the field of art history. Using this attack as a case study, I argue that the event is semioclastic, as opposed to iconoclastic or vandalistic, meaning that it is an attack on the painting as a sign and is therefore reliant on the relationship between object and viewer. Word choice has a direct impact on the way we think, and after analyzing research on both iconoclasm and vandalism, neither term accurately represented this incident. In an attempt to more precisely describe this attack, I propose the need for new and different terminology, choosing to define it as semioclasm. I conclude with a discussion on the erasure of these violent attacks, arguing that through their restoration processes, museums attempt to erase the event from history. In this specific case, it is evident in the immaculate physical restoration of the painting and the information, or lack thereof, the museum provides on this event.

The Politics of Fascist Memory in Contemporary Rome

Lindsay N. Maldari (Dr. Evan Gatti) Department of Art and Art History

There is a growing body of scholarship that recognizes the superficial tactics by which Italy usually recognizes its Fascist past. These narrative tactics frame Italy's transgressions in World War II as lesser than its German counterpart, write off Mussolini's antisemitism as merely pragmatic rather than inherent to Fascist ideology, and ultimately refuse to acknowledge the instrumentality of Italian Fascism (Baum, 2001; Nidam-Orvieto, 2009; Stille, 2009; Milicia, 2017).

Museum displays and exhibitions also reveal how Italian history is now being framed and remembered in the public consciousness. This presentation compares recent commemorative displays in Rome that take World War II and the Holocaust as their focus: The Museo della Shoah and Jewish Museum of Rome's recent exhibits on antisemitism in World War II and the Palazzo delle Esposizioni's exhibition "Witnesses of Witnesses: Remembering and Recounting Auschwitz." Through these examples, I juxtapose conventional modes of remembrance with those that force the viewer to actively face and acknowledge the extent of Italian antisemitism.

These analyses not only consider the messages museums promote, but also the means by which they do so. Notable tactics include everything from the immersiveness and intended interactivity of an exhibit to its narrative technique and spatial planning. For instance, although individualized and humanized narratives evoke emotional response across each exhibit, I argue that the intentionally deliberative and decision-oriented structure of the "Witnesses of Witnesses" exhibit make its viewers more effective stewards of survivors' stories. By initiating the viewer with a mock train ride to the concentration camp, creating audio and visual elements that can only be triggered through viewer interaction, and explicitly informing the viewer of their responsibility to pass on the story of this experience, the "Witnesses of Witnesses" exhibit instigates the active modes of remembrance that have for too long been missing across Italy. I ultimately argue that these effective museological tactics drive home the active responsibility to recognize Fascist antisemitism and can help viewers incorporate similar, intentional acts of reconciliation and remembrance into their daily lives.

Mapping the Relationship Between Land and Food Through Soil

Charlotte F. Murphy (Professor Samantha DiRosa) Department of Art and Art History

Soil makes up the earth upon which our food is grown, and its impact goes beyond the physical land to influence the food we find on our dinner plate. In my work, I seek to bring attention and contemplation to soil as the foundational element in the sustainable food process. By incorporating soil as a paint medium, I acknowledge its presence in the various stages of the food process: the beginning, which is the physical farmland, and the end, being the sustenance produced from the soil. In painting detailed portraits of food (that which is produced from the farm and that which is part of the farm animals' diet) and maps of the farm land at Cane Creek Farm in Saxapahaw (where I gathered the physical soil I utilize as paint), I enable the viewer to consider the relationship between a place (represented by the map) and a food product (represented by the meat). A conversation about this relationship occurs a number of ways:

through close proximity of the pieces in the display and through visual similarities between paintings, such as line quality and shape. Although I do not seek to imply that a map of the land and a portrait of bacon are the same through their visual similarities, I aim to convey the way that soil connects these components of the food process. In short, my paintings act as maps: by referencing the specificity of place—the local farm—and its relationship with the resulting food item. I choose to employ the concept of mapping as a way to mediate the disjointed view of the larger food system. In summary, I underscore the value of sustainable food systems, such as the foodshed at Cane Creek Farm, which act in opposition to the identity-less and irreverent processes of the factory farm industry. Given that maps are commonly used as tools of navigation, location, and identification, by implementing this concept in my paintings, I help the viewer traverse the underlying foundation that soil creates between farm and fork.

Biology

Investigation of the One Carbon Metabolism Pathway and Methylation Production

Meagan C. Branch (Dr. Linda Niedziela) Department of Biology

Spina bifida, which is the failure of the neural tube to close during development, occurs in approximately 1 out of 1000 newborns. With prenatal diagnosis, the deformity can be fixed *in utero*, but the long-term implications of the deformity expand further than just the open neural tube. Currently, there is not enough known about the long-term implications to effectively cure spina bifida in patients who present with the deformity. Previous research has shown that an increased consumption of folic acid during pregnancy is linked to a decreased chance of a baby developing spina bifida. Folic acid metabolism occurs in the One Carbon Metabolism (OCM) pathway and is also important for DNA methylation. Dihydrofolate reductase (DHFR) is the first enzyme in the OCM pathway and is known to be competitively inhibited by methotrexate, producing similar effects to low folic acid levels. We observed an increase of neural tube defects in zebrafish embryos whose parents were treated with methotrexate; however, there was no significant difference in DHFR activity between normal and affected embryos. Therefore, the next step was to directly treat the embryos with methotrexate. Again we found an increase in deformed embryos with treatment. These embryos will be used to test the hypothesis that inhibition of the OCM leads to change in methylation patterns, which affects expression of a gene linked to normal neural tube development. We will perform bisulfite-conversion followed by DNA sequencing to compare methylation patterns in affected embryos compared to a control. If there is a significant difference in methylation patterns between the treated and untreated samples the data will support the hypothesis that the OCM pathway is important for gene expression and is possibly connected to spina bifida.

Resurrection of Extinct Retroviruses within the Chimpanzee Genome as a Tool to Combat Viral Infection in Human Populations

Grace T. Carter (Dr. Alfred Simkin) Department of Biology

When viruses infect us, they hijack our cellular machinery, turning our cells into virus factories. Retroviruses have the unique capability to synthesize DNA copies of themselves and insert these copies into the genome of a host cell. Somatic cells infected with a retrovirus will eventually die,

but when a newly fertilized egg cell is infected, every cell in the developing embryo will now contain the virus as a part of its genome. This allows the virus to be passed from generation to generation. After millions of years of this process, nearly 8% of the human genome is now made up of DNA from retroviruses. The human immunodeficiency virus (HIV) is a retrovirus origination from the genetically-similar simian immunodeficiency virus (SIV) in African primates, which crossed species into the human population and consequently became one of the most evolutionarily successful--and most lethal--retroviruses in modern human history. HIV came from SIV, but where did SIV come from? Identifying extinct retroviral sequences that have integrated into the chimpanzee genome allows us to gain insights into how retroviruses evolve and what makes a retrovirus good at evading detection by the host's immune system. Using computer programs such as LTR_Harvest, the UCSC Genome Browser, and original programs written specifically for this research, we have identified hundreds of areas of interest in the chimpanzee genome which may contain remnants of the DNA of extinct infectious retroviruses. Reconstructing these retroviral DNA sequences by analysis of their protein encoding regions and their sequence similarity to nearby retroviral elements will allow for analysis of the proteins which they once coded for. My work will also provide a basis for comparison between extinct retroviruses, extant non-infectious retroviruses, and infectious retroviruses such as HIV/SIV.

A Call for Clarity: An Assessment of the Accessibility, Usability, and Simplicity of Transposable Element Annotation Programs

Jose Daniel Castillo, Kayla M. Ervin, Emily E. Hughes, & Tristan K. Scarce (Dr. Alfred Simkin) Department of Biology

Transposable elements (TEs) are repetitive DNA sequences that make up a large portion of eukaryotic genomes, the DNA template contained in the nucleus of almost every eukaryotic cell. Some families of TEs have functional implications for cellular replication and gene regulation and can potentially alter the course of evolution. Other TE families seem to remain functionally dormant and have no effect on the cell or organism, but continue to replicate and “jump” to different locations around the genome. The scientific community still has much to learn about these commonly occurring DNA elements. In order to further study TEs, it is necessary to identify and annotate their DNA sequences. There are several computer programs that will locate and annotate the TEs in a genome. Though the current literature states that these programs are efficient and user-friendly, in our experience their simplicity is vastly exaggerated. This research aims to identify major problems regarding installation, dependencies, and documentation to offer solutions for current and future TE annotation programs.

Several TE annotation programs were utilized in this research. There are two types of programs that currently exist: de novo programs and homology-based programs. De novo programs discover novel TEs by observing the repetitiveness of each sequence within a given genome. On the other hand, homology-based programs use known TEs in one genome to identify TEs in a newly-sequenced genome. Each program has its own benefits and shortcomings, but all are said to be “easy to use”. If this is the case, it should be possible for researchers with little to no prior experience with programming to operate them successfully. This was not our experience. Our research team attempted to use these programs in the hopes of comparing the benefits and drawbacks of each program, but we were unable to successfully run the programs. We determined that these programs could be improved in several ways. First, the installation process

could be upgraded by ensuring that the programs are updated frequently. Second, the programs could also use fewer dependencies such as Java. Finally, the documentation for each program could be more comprehensible to allow new users to easily download and use the software. Addressing these issues will greatly enhance the usability of TE annotation programs and allow researchers to more easily study TEs.

Terrestrial Snail (*Helix*) Response to Acceleration versus Velocity in Vibrational Stimuli

Bryanna Michelle Chazotte (Dr. Eric Bauer) Department of Biology

Sensory system modalities and range limitations of many organisms provide important information on the potential environmental pressures of that species. Vibration detection can be part of antipredator behaviors and previous research has shown the presence of the vibrational sensory systems in snails and the subsequent withdrawal response. However, the intensity and frequency ranges of this sensory system have yet to be characterized. This research used controlled vibration generation and attenuation to determine the minimum vibrational output that will generate an observable response in *Helix* snails. Preliminary data has suggested that snails are most sensitive to low frequencies, between 20 and 80 Hz, with an approximate upper sensitivity of 40 Hz. Additional data collection and analysis will continue through this semester. Overall, my project better quantifies the minimum accelerations needed to elicit behavioral responses (the thresholds) in *Helix* snails and more precisely defines the magnitude of their sensitivity. This threshold information will be used as the baseline for future projects including the evolution of vibrational sensation in snails, physiological pathways for vibrational stimulus, and environmental factors that affect a snail's sensory abilities.

Analytically Modeling the Genetic Drift of MicroRNA Binding Sites

Keeley W. Collins (Dr. Alfred Simkin) Department of Biology

MicroRNAs (miRNAs) control the expression of many genes within the genome. When a miRNA is bound to a gene, that gene will not be expressed. Which genes are controlled by which miRNAs is determined by the miRNAs' binding site within the gene. The binding sites are short in length (about 8 nucleotide base pairs), and if the binding sites were allowed to undergo random mutations, the destruction and creation of new binding sites would quickly undermine gene function for a species. Computational simulations and modeling are commonly used methods for interpreting change in genomes over time. Previously, we used simulations to allow random mutations in binding sites for ancient miRNA binding sites that are conserved across several species. This project improves upon the accuracy of the previous evolutionary model by taking a more analytical approach. Instead of using a simulation of random mutations occurring over time, we used probabilities of certain mutational events occurring within a binding site to directly calculate the probability of the binding sites either being created or destroyed over time from ancestor to descendent. In order to accomplish this, we populated sparse matrices with the probabilities of one miRNA binding site mutating into another, and the matrices were multiplied to simulate mutation steps over time. The simulated evolutionary rates were compared to mutational events that have been inferred to have occurred across time from ancestor to descendent, and we found that the binding sites of miRNAs were evolving much more slowly than they would as modeled in the simulation. The resulting probabilities will verify the values

that the previous simulations converged on, and the results will be compared to real evolutionary rates to refine our previous conclusions.

The Tale of the Tail: The Rattlesnake's Rattle as an Adaptation due to Natural Selection

Emily H. Cooper & Bonnie S. Bloxom (Dr. Gregory Haenel) Department of Biology

It has been argued that the rattle of the rattlesnake produces one of the most recognizable sounds known to humankind. However, the evolutionary origins of the rattle are still unclear. Is the rattle a predator deterrent, a lure to attract prey, or an evolutionary accident? The goal of this research was to determine if the rattle of the rattlesnake has evolved as an adaptation due to natural selection. An adaptation is a feature of an organism that arose through natural selection that enables the organism to survive and reproduce in its environment better than if it lacked said adaptation. In order for a trait to evolve by natural selection, there must be variability in the trait among individuals, heritability of the trait, and a fitness advantage in possessing the trait. We have synthesized a comprehensive review of over 30 peer-reviewed articles about rattlesnake evolution to address this question. Research has shown that the rattle does vary between individuals and does contain a genetic component that can be passed from parent to offspring, making the trait variable and heritable. Additionally, rattling has a low energy expenditure, which indicates that there is not a significant fitness trade-off in possessing a rattle. Researchers have also argued that the rattle functions as a mechanism to warn predators of the snake's presence, which would increase their likelihood of survival. It appears that the rattle likely arose in an ancestor as a mechanism for deterring predators that were present during the same time as the origination of the rattle. When examining rattle loss on island rattlesnakes, it was found that the absence of predators on islands may be the cause of a reduced selection pressure of the rattle, providing additional evidence that the rattle functions as an anti-predator mechanism. Our review of variability, heritability, and fitness of the rattle supports the hypothesis that the rattle meets the standard to be considered an adaptation due to natural selection.

Investigating the Relationships between Varying Levels of Expressivity of Transposons and piRNAs in *Drosophila simulans*

Emily H. Cooper (Dr. Alfred Simkin) Department of Biology

The regulation of genetic information is known to affect the physical characteristics and behaviors that an organism exhibits. These qualities can be altered by the presence and absence of microscopic structures, such as piwi-interacting RNAs, often called piRNAs. These naturally occurring molecules affect the characteristics of an organism by suppressing different sections of the organism's genetic makeup. The portions of the genetic code that piRNAs regulate are called transposons, which are larger segments of DNA that are repeated throughout an organism's genome and have the ability to duplicate. This research project aims to further the understanding of the relationship between piRNAs and transposons and how their interactions may affect an organism's gene expression. piRNAs are known to suppress transposons through an immune-like response, which breaks down transposons and creates new piRNAs in the process. The regulation of transposons by piRNAs effectively prevents the quantity of transposons in an organism's genome from increasing exponentially, which could alter the physical characteristics of an individual. In order for this to occur, the piRNA and transposon must be a perfect match,

which suggests a limiting relationship between transposons and their associated piRNAs. Previous research has identified the mechanistic relationship between piRNAs and transposons, but the correlations between individual TEs and their matching piRNAs are still being investigated. To further investigate this relationship and the combined impact of piRNAs on gene regulation, databases containing the genetic codes of piRNAs and transposons from *Drosophila simulans*, a fruit fly species, were analyzed using the Python programming language. This methodology primarily includes the writing and execution of programs on large bioinformatic datasets to identify matching pairs of piRNAs and transposons, which can be used to determine the quantitative relationship between transposons and their associated piRNAs. Preliminary data analysis, which included all possible piRNA and transposon matches, has shown that each individual transposon has very few matching piRNAs. This suggests that the specificity between transposons and their matching piRNAs is likely a limiting factor in the regulation of transposons.

Northern Mockingbirds' Bio-Acoustic Selection of Model Frog Species

Anna M. Corsiglia (Dr. Dave Gammon) Department of Biology

Northern Mockingbirds (*Mimus polyglottos*) are widely admired for their vocal mimicry abilities. Compared to the preexisting research on mockingbirds' selection of a menagerie of avian model species, little is known about their mimicry of non-avian models. The aim of this study was to observe which North American species of frog are mimicked by Northern Mockingbirds. Based on earlier studies of the physiological abilities of mockingbirds, I hypothesized that they would be capable of imitating 50 out of 71 North American frog species, as these calls' dominant frequencies were within mockingbirds' vocal range. I tested this hypothesis by examining 40.5 hours of song recorded from free-living Northern Mockingbirds across North America. From these recordings, I identified the mimicry of 16 frog species. Fifteen of these 16 species were included on my list of 50 mimicable frog species; the 1 remaining call that was mimicked as an exception to my predictions was altered by the mockingbird to fit the frequency parameters set by his physiology. These results suggest that a call's acoustic properties are likely an important criterion by which mockingbirds select their model species. Additionally, mockingbirds may alter the frequencies of a model's call to better match the frequency range of their own vocal abilities.

Studying the Functions and Contexts of Vibrational Communication in Neotropical katydids

Alina K. M. Iwan, Ciara Kernan, Amber Litterer, & Hannah ter Hofstede (Dr. Jen Hamel) Department of Biology

Animals can communicate using visual, tactile, chemical, acoustic, and vibrational signals. Some animals use more than one mode, for example, producing both acoustic and vibrational signals. The benefits of multimodal communication may include reaching receivers in variable environments and avoiding eavesdropping predators. Here, we examined multimodal communication in katydids (Orthoptera: Tettigoniidae), a group of insects closely related to crickets and grasshoppers. Male katydids attract mates using airborne acoustic chirps, and males and females of some species also produce substrate-borne vibrations, called tremulations, by

vertically oscillating their bodies as they perch on plants. The functions and contexts of these vibrational signals are not well understood. We first recorded and quantitatively characterized tremulations from males of multiple katydid species in a laboratory setting. We found that males of some species tremulate spontaneously, without a female present, suggesting that males may tremulate to attract females. We next quantitatively described the behavior of isolated males, isolated females, male - female, and male - male pairs of one species (blue-faced katydids, *Docidocercus gigliotosi*) on their host plants in a field setting. We recorded katydid behavior using an infrared video camera and detected tremulations using microaccelerometers affixed to leaves of the host plants. Preliminary results suggest that male and female blue-faced katydids perform tremulation duets prior to mating; that males increase the rate of tremulation when a female is present; and that females only tremulate in response to signaling males. We discuss hypotheses about fitness-related functions and benefits of multimodal signaling for blue-faced katydids and suggest future work for this project.

Analysis of Tree Mortality in Carbon Offset Plantings in Central NC

Kylie E. Roehrle (Dr. David Vandermast) Department of Biology

Between 2016-2017, over 1,000 trees were planted in North Carolina's Piedmont physiographic region as part of three carbon offset programs: Delta Airlines (Delta), Duke University (W&G), and Elon University (Price Park). Over the next 40 years these trees will sequester carbon, after which the sequestered carbon can be sold or used as an offset credit. A key factor influencing total carbon sequestration is sapling mortality. The purpose of this research is to conduct a site verification of each tree in order to determine the first-year mortality rate of the trees in each planting, and to estimate the amount of carbon likely to be sequestered after 40 years. Verification was conducted per the Duke Carbon Offset Initiative (DCOI) protocol. Urban plantings such as these have an expected mortality rate of 3-8% after forty years. We hypothesized that the observed mortality rate after one year would fall below this range. Our results showed that there were significant numbers of missing or misidentified trees for the Delta project. Furthermore, we found that the mortality rates for trees planted in each project were: Delta 21%, W&G 7.1%, and Price Park 5.9%. As a result of the excessive mortality rate of the Delta project, the project could not be validated for carbon offset purposes. Across all sites, we identified lack of control over planting techniques, drought, and buck antler rubs as significant causes of mortality. We calculated that in 40 years 278 MtCO₂e is expected to be sequestered in Price Park, 447.91 MtCO₂e in the W&G project and 6,545.9 MtCO₂e in the Delta project. Our hypothesis was not supported by our results because the mortality rates at each site exceeded the 3% threshold in all projects. Our research into patterns of mortality and their effect on carbon sequestration will help to guide future sequestration projects in the Piedmont physiographic region.

Oxytocin and Its Effect on the Neuroblastoma Cell Line, SH-SY5Y

Alyssa N. Smith (Dr. Tonya Laakko Train) Department of Biology

Oxytocin and the oxytocin receptor (OTR), commonly observed in the reproductive system, have also been detected on neural, immune, and cancer cells. The role of oxytocin in the nervous system is generally unknown. Previous research suggests that oxytocin increases the

concentration of neuroblastoma cells. In this study, the effect of oxytocin on neuroblastoma cell concentration and apoptosis was observed. Human neuroblastoma cells (SH-SY5Y) were exposed to oxytocin and counted with a flow cytometer. Results of triplicate experiments show that exposure to 1 μ M oxytocin for 72 hours did not result in different cell concentrations when compared to cells growing in normal conditions ($p=0.797$, $p=0.173$, $p=0.169$). To determine whether oxytocin was protective of cells grown under nutrient deprivation, SH-SY5Y cells were starved and treated with oxytocin for 48 hours. Using Annexin V staining, the percent apoptosis in normal and starved conditions were determined and showed no significant difference ($p=0.225$). Considering that no significant results were observed in the presence of oxytocin, the expression of the OTR on the surface of SH-SY5Y cells was investigated via immunofluorescence. Contrary to previous publications by other groups, preliminary immunofluorescence experiments suggest that the OTR is not expressed on the surface of SH-SY5Y cells. Overall, in both normal and nutrient-poor conditions, oxytocin had no effect on neuroblastoma cell growth, which may be explained by the lack of an OTR on the SH-SY5Y cell line. To better understand how oxytocin may regulate neuroblastoma cell proliferation, further investigation of the expression of the OTR using different mechanisms (RT-PCR) and testing other cell lines is necessary.

The Impact of Early Adult Diet on the Reproductive Development of Two Hybridizing Species of Insect

Sydney R. Solomon (Dr. Jen Hamel) Department of Biology

Interspecific mating, when two individuals of different species mate with one another, is common in nature. Diet and other factors that affect individual reproductive development for each species may also affect the likelihood and consequence of interspecific mating. In North Florida, two species of squash bugs (Hemiptera: Coreidae: *Anasa tristis* and *Anasa andresii*) have overlapping populations, and individuals of both species mate with one another in the field. Both species eat, mate, and lay eggs on the plant species *Cucurbita pepo* and *C. moschata* in the field, but *A. tristis* occurs at higher field densities on *C. pepo*, and *A. andresii* on *C. moschata*. Diet can influence juvenile development and adult body size in insects, however, the influence of diet on reproductive outcomes is less well studied. Here, to uncover how diet might influence the outcomes of interspecific mating by these two insect species, we examined its impact on their reproductive development during early adulthood. For female *A. tristis*, ovarian development was significantly greater with a diet of *C. pepo* (N=28) than with a diet of *C. moschata* (N=20) (Wilcoxon test: $P<0.001$). Surprisingly, neither diet promoted ovarian growth for *A. andresii* (N= 21) on *C. pepo* and (N = 20) on *C. moschata* (Wilcoxon test: $P=0.283$). The ovaries of adult *A. tristis* experienced greater development than those of *A. andresii* overall (Wilcoxon test $P<0.001$). Our findings suggest that in the field, female *A. tristis* display adaptive host preferences, occurring most abundantly on the plant variety (*C. pepo*) that promotes more rapid ovarian development. The lack of ovarian development in *A. andresii* suggests a missing component of nutrition, a missing developmental cue, or constraints in processing nutrition. We discuss likely explanations and next steps for this project.

The Effects of Morphology and Mitochondrial DNA Haplotype on Sprint Speed in a Desert Lizard

Kamberly L. Terry (Dr. Gregory Haenel) Department of Biology

Genes influence the development of animal shape and size, which in turn affects performance. Performance ability can then directly impact the evolutionary success of individuals in a given environment through actions like predator escape. In this experiment, sprint performance was measured in a population of long-tailed brush lizards, *Urosaurus graciosus*, to test for the predicted positive relationship between morphology and speed. Due to previous hybridization events, some individuals in the study population carry the mitochondrial DNA (mtDNA) haplotype of the closely related species, *U. ornatus*. Therefore, the impact of heterospecific mtDNA on sprint speed and morphology could also be examined. Because products of mtDNA are known to interact with proteins from nuclear DNA in the production of energy, it was expected that individuals with heterospecific mtDNA would show relatively decreased performance ability. Measurements including body length, tail length, hind- and forelimb length, and mass were recorded from 57 lizards in an Arizona population. Sprint performance was measured by video recording the lizards running up an inclined track into a tree. Linear regressions of each morphological variable showed that both hindlimb length and body mass were positively related to sprint speed after controlling for body size. These results suggest that hindlimb length and mass may be important traits for natural selection to act upon in these lizards. MtDNA haplotype was determined using PCR and agarose gel electrophoresis. Lizards with mismatched mtDNA due to hybridization did not show a decrease in sprint performance ability. However, variations in mtDNA may still affect endurance, as this performance ability involves oxygen consumption, providing a more direct link to mitochondrial dysfunction than sprint performance. Interestingly, lizards with heterospecific mtDNA were found to have a significantly higher frequency of tail breaks, suggesting that lizards with heterospecific mtDNA were less successful at escaping predators.

Ice Storm Effects on Secondary Succession in EUF

Madeline J. Turnau (Dr. David Vandermast) Department of Biology

A storm on March 6th, 2014 brought unusually heavy ice and snow to Elon, North Carolina. Data were collected in Elon University Forest (EUF) during 2018 and compared to data from 2010 and 2014 to understand how this storm affected ecological succession. EUF is a patchwork of different aged trees, ranging from 50 years to areas called “forests of continuity” that have never been clear-cut. The 2014 study found significant mortality and damage to Virginia pine (*Pinus virginiana*) suggesting that storm-caused changes to the forest were primarily driven by changes in abundance of this species. Here, we seek to determine whether the storm increased the rate of secondary succession in EUF, with a hypothesis that ice storm damage would accelerate secondary succession by hardwoods. Data were collected on eight permanent plots using standard Carolina Vegetation Survey (CVS) protocol. Our results indicate that EUF continues to lose Virginia pine and gain assorted hardwood species. As a result, there has been an increase in Shannon diversity (from 2.43 to 2.54), tree density (from 552.5 to 571.3 trees/ha), and basal area (from 32.6 to 33 m²/ha), since 2014. Our results also show that the storm resulted in a significant decrease in tree density from 2010 to 2014 (from 622.5 to 552.5 trees/ha, $P < 0.01$).

and that, despite the recent increase, tree density in 2018 is still significantly lower than it was in 2010 (622.5 vs 571.3 trees/ha, $P < 0.01$). The annualized mortality rate for Virginia pine was 5.6 trees/ha/yr for the four years prior to the storm and has been 4.1 trees/ha/yr after it. The changes we have observed indicate that EUF continues to recover from the storm but our data do not support our hypothesis that the storm would accelerate the rate of succession.

Common e-Cigarette Constituents' Effects on Neophobia of Adult Zebrafish

Daniel L. Wallowicz & Cory B. Weller (Dr. Eric Bauer) Department of Biology

The popularity and use of e-cigarettes has risen tremendously in the past few years. But, there is very little research on the toxicity of the chemicals found in e-cigarettes when they are inhaled. One possible site of action of these chemicals is the brain. Any effects of these chemicals on the functioning of the brain will manifest themselves as changes in the behavior of the subject. In this study, adult zebrafish were exposed to two common flavorants in e-cigarettes: ethyl butyrate and cinnamaldehyde. Zebrafish exhibit neophobia when there is a change in their environment, and this behavioral response was used to look for effects on brain structures related to fear, stress, and memory. Behaviors related to swimming kinetics and location preference within the test tank were quantified before and after fish were exposed to a novel object within the test tank. Untreated fish were found to show neophobia (avoidance of the side of the tank where the novel object appeared) that persisted for at least 15 minutes, though the intensity of the neophobia weakened during that time. In contrast, behaviors that were not related to the presence of the novel object, such as total distance swum or the amount of time spent at the bottom of the tank, did not change. Repeated trials separated by one week did not alter the neophobic response nor other swimming behaviors. Our experiments are still ongoing, but any neurological effects of ethyl butyrate and cinnamaldehyde may manifest as changes in neophobic behaviors specifically or may impact other swimming behaviors relative to the control data. The behavioral alterations will point to potential neurological functions and structures impacted by these chemicals.

Evolutionary Responses in Copy Number of Kruppel-Associated Box Zinc Finger Proteins: A Test Using Hybrid Lizards

Katherine R. Westover (Dr. Gregory Haenel) Department of Biology

Zinc finger proteins with an associated KRAB domain (KZFP's) form a species-specific layer of epigenetic regulation. These domains are important for regulating gene expression during development and for repressing expression of potentially harmful genes. They are known to vary dramatically in copy number between groups of species. However, the exact reasons for this variation remain unclear. One mechanism thought to drive the increase in copy number of KRAB domains relates to speciation rates. In mammals, groups of species with high rates of divergence tend to have high copy numbers of KZFP's. Another driving factor of KZFP proliferation may be environmental stress. The number of KZFP's may increase in a species that experiences high stress from their environments since KZFP's are regulatory. While KZFP's are well characterized in mammals, less research has been done on them in other vertebrate lineages. Two lizard species, *Urosaurus ornatus* and *Urosaurus graciosus*, are known to hybridize and were useful for testing both possible mechanisms. *U. ornatus* has widespread, isolated populations that are genetically divergent. *U. graciosus* lives in very hot, stressful environments

with low divergence among populations. Hybrids live in environments similar to *U. graciosus* but have the mitochondrial DNA (mtDNA) of *U. ornatus*. Because hybrids have mtDNA which is from a different species than their nuclear DNA, they should experience greater stress in these hot environments. We first characterized KRAB's for *U. ornatus* and *U. graciosus* by BLASTing known KRAB sequences from the lizard *Anolis carolinensis* onto the two lizards' transcriptomes. PCR primers were then designed from flanking sequences. Quantitative PCR was used to determine the copy number of a KRAB sequence among lizard populations. The hybrid lizards had the highest average copy number of the KRAB. The speciation hypothesis was rejected, but the data lends support towards the stress hypothesis. These results are important in understanding the evolutionary role the KRAB domain has had as a powerful gene repressor.

Copulation Control in the Squash Bug (*Anasa tristis*)

Connor D. Whiffen (Dr. Jen Hamel) Department of Biology

In sexually-reproducing species, copulation duration can affect the outcomes of a given mating and also the lifetime reproductive success of the individuals involved. Optimal mating duration may differ by sex within a species. For example, males that engage in longer copulations may transfer more sperm and/or accessory secretions and prevent rival males from mating with a given female; females that mate for longer durations may decrease harassment by other males, and/or gain more resources. By decreasing copulation duration, both sexes may reduce predation risk, metabolic costs, and missed opportunities for foraging or acquiring additional mates. In the squash bug (*Anasa tristis*), copulation durations vary and can be extremely prolonged, ranging from a few minutes to several hours. Prior work suggests that females do not gain nutritional resources from long copulations, and that sperm transfer occurs within the first 30 min. Here, in an attempt to infer which sex controls copulation duration, I evaluated behavior by males and females during and preceding the end of copulation. Data were gathered from hundreds of hours of mating trials video-recorded during Summer 2016. Males end copulations more frequently than do females (χ^2 goodness-of-fit: 6.37, $df = 1$, $P = 0.01$). Copulations end in three ways: after the mating pair folds up (i.e. when during copulation, one individual pivots from the normal end-to-end orientation so that the ventral surfaces of the male and female abdomens are in contact); after a rival male walks past a mating pair; and spontaneously, when one individual pulls away from the other. I discuss likely explanations for prolonged copulations in this species that relate to fitness, including first male precedence, and I suggest future directions for this project.

Chemistry

Investigating the Effects of Stereochemistry on the Cyclization of Sorbitol and Allitol Sugars and Non-sugar Model 1,4-pentanediol by $B(C_6F_5)_3$ and Allylsilane Co-catalysis

Erin B. Armstrong (Dr. Jennifer Dabrowski) Department of Chemistry

Many of the products we utilize every day come from crude oil, including gasoline, plastics, and cosmetics. While it is commonly known that fuels come from crude oil simply through refining, it is less commonly known that crude oil is the main starting material to produce numerous ingredients used in consumer products. Non-renewable resources have simpler chemical structures to renewable resources and are mainly composed of hydrocarbons that function as the

backbone for more highly engineered products. Because of their simplistic structure, crude oil requires a series of chemical modifications in order to be used as ingredients. The purpose of this research is to find an alternate way to produce consumer products so that crude oil is no longer heavily relied on. Initial investigations utilized silyl-protected sorbitol and allitol (Si-sorbitol and Si-allitol). These are linear six-carbon sugars that vary in their stereochemistry (the arrangement of groups in 3-dimensional space) which was hypothesized to affect reaction efficiency and selectivity. Reactions were conducted in CDCl_3 , and a co-catalyst system involving trimethylallylsilane and trispentafluorophenylborane, $\text{B}(\text{C}_6\text{F}_5)_3$, resulted in a five-membered ring via cyclization as determined through NMR analysis (proton, carbon, COSY, NOSY, HSQC). Preliminary optimization of isolation protocols were conducted including purification through silica gel chromatography and subsequent removal of silyl protecting groups. Optimal cyclization occurred when the reactions were performed in the glovebox under nitrogen gas (N_2). Multiple trials were run to screen catalyst loading and to monitor reaction progress over time. Si-sorbitol required lower temperatures and extended reaction times to achieve selective single cyclization, as a second cyclization was discovered to occur at room temperature. Conversely, Si-allitol cyclized at room temperature to exclusively form a single cyclization product. Exploration of a non-sugar model system, silyl-protected 1,4-pentanediol (Si-1,4-pentanediol; linear five-carbon alcohol), indicates that the sugar scaffold is critical for the observed reactivity due to its failure to cyclize. Future studies will investigate which groups on sugar molecules are responsible for the observed reaction differences.

Kinetic Studies of the Aqueous Carbonate System by Raman Spectroscopy

Jake Don Boyar (Dr. Anthony Rizzuto) Department of Chemistry

Despite its integral role in physiological buffering and the global carbon cycle, the central piece of the carbonate system, carbonic acid (H_2CO_3), remains incompletely characterized in an aqueous environment. Carbonic acid has only been identified previously using a high-powered x-ray source, a technique that is not viable for every research laboratory. Therefore, a novel alternative approach to the detection of carbonic acid was selected to study the decomposition of carbonic acid. Raman spectroscopy has been employed to study the decomposition of aqueous carbonic acid. The high-resolution technique allows for differentiation between the very similar derivatives of carbonic acid (i.e. carbonate, CO_3^{2-} , bicarbonate, HCO_3^{-1} , and carbon dioxide, CO_2). The formation of carbonic acid in aqueous solution is achieved by mixing bicarbonate and acid via a novel fast-flow liquid microjet system wherein the reaction time is entirely under experimental control. By using the rate of appearance of the carbonic acid feature, it will be possible to collect quantitative kinetic information about the decomposition of carbonic acid in a aqueous phase.

The Aggregation of Amyloid Beta and Insulin Peptides

Sarah A. Brown (Dr. Kathryn Matera) Department of Chemistry

Neurological diseases, such as Alzheimer's, have been correlated to the aggregation of peptides in the brain. Peptides such as amyloid-beta ($\text{A}\beta$) and insulin (Ins) are very susceptible to aggregation. When Ins and $\text{A}\beta$ are aggregated separately or together, both soluble oligomers and

insoluble fibrils form which prove to be toxic within the brain. With A β correlated to Alzheimer's disease (AD) and Ins to diabetes, the resulting aggregation patterns are used as evidence supporting the hypothesis that having diabetes increases the risk of developing AD. To examine the aggregation patterns of these peptides, solutions of Ins and A β monomers were allowed to aggregate and the resulting solutions were analyzed using gel electrophoresis, Bradford assays, and Thioflavin T assays (ThT). For further analysis of the aggregation patterns, the insulin B chain (InsB) was used in place of normal Ins (A and B chains) with A β . Three mutated InsB chains (K29A, P28D, P28K/K29P), two of which being current diabetes treatments, were then tested for aggregation abilities to further establish modes of aggregation between peptide strands. The findings showed that when A β and a form of Ins were aggregated together, there was a larger presence of fibrils than when aggregated separately. Further examination of peptide aggregation between both Ins and A β with α -lactalbumin have identified key components of the peptide chains that aid aggregation and helps link AD and diabetes.

The Stabilization of A β Oligomers Using Serotonin, Indole, and Catechol and Their Effects on DNA

Elizabeth A. Chapman (Dr. Kathryn Matera) Department of Chemistry

Alzheimer's disease (AD) is one of many diseases that causes the breakdown of cerebral tissue and subsequent symptoms like difficulty in forming memories, confusion, personality changes, and inhibition of motor function. The amyloid hypothesis states that amyloid-beta (A β) peptide aggregates play a role in the death of brain cells and is one of the most accepted explanations for AD propagation. Smaller, soluble aggregates of A β known as oligomers have oxidative effects on the brain, which can result in the brain damage characteristic of AD. In this experiment, the effect of aromatic compounds on the formation of oligomers was studied, since some aromatic molecules in the brain, like the neurotransmitters dopamine and norepinephrine, stabilize A β oligomers and may mediate their toxicity. Experiments involving damaging DNA via these oligomers were also conducted. Thioflavin T assays and gel electrophoresis were used to observe the extent of aggregation of A β peptides and their ability to oxidize DNA. In the presence of the neurotransmitter serotonin and several molecules of similar chemical structure, it was shown that small molecules with two hydroxyl groups adjacent to one another on a benzene ring do stabilize oligomers and may mediate their toxicity more effectively than those small molecules without the hydroxyl functionalities. Determining how A β oligomers are affected by small molecules in the brain will help ascertain the pathology of AD and lead to more effective treatments and medication.

Synthesis, Characterization, and Bioactivity of Coordinate Vanadium Complexes as Antibiotic Compounds

Nicholas G. Ciolkowski (Dr. Jennifer Dabrowski) Department of Chemistry

Increasing incidences of antibiotic resistance among pathogenic organisms in recent years has led to a greater interest in the development of new alternatives to conventional antibiotics. Coordinate metal organic complexes are a promising source of development in this area, particularly those targeting phosphatase enzymes in bacteria as phosphate groups are important

components of many biochemical reactions. Vanadates are metal coordination complexes that are structurally analogous to phosphate groups, where the central phosphorous atom is replaced with vanadium. The ability of vanadates to mimic phosphate groups and act as phosphatase enzyme inhibitors in biological systems indicates potential for these compounds to be used for the development of novel therapeutics. It is thought that this inhibitory activity could work in tandem with commercially available antibiotics to enhance their activity against resistant organisms. The bioactivity of coordinate vanadium complexes of commercially available antibiotics is under investigation. Three complexes of vanadium (IV) and a series of antibiotics including ampicillin, erythromycin, and tetracycline have been isolated. These complexes have been characterized via infrared and UV-vis spectroscopy, as well as ^1H , and ^{13}C nuclear magnetic resonance spectroscopy. Preliminary results from minimum inhibitory concentration assays against *E. coli* and *B. subtilis* indicate that the vanadium–tetracycline complex best retains the bioactivity of the original antibiotic, while complexes of vanadium–erythromycin and vanadium–ampicillin show partially impaired and negligible activity respectively. Examination against antibiotic resistant bacterial strains are ongoing.

The Effects of Cholesterol on the Aggregation of Amyloid Beta in Alzheimer's Disease

Bailey Gilmore (Dr. Kathryn Matera) Department of Chemistry

Amyloid beta, a peptide found naturally in the brain, readily aggregates to exert toxic effects on the brain, causing diseases such as Alzheimer's. The peptides interact through non-covalent bonds to form soluble oligomers and eventually larger, insoluble fibrils. The oligomers are considered the toxic form, causing oxidation of nearby biomolecules, while fibrils are believed to be too insoluble to likely play a role in neurodegeneration. Cholesterol, an essential component of cell membranes, has been shown to stabilize the oligomeric form of the aggregates, as seen through Thioflavin T assays, Bradford assays, and gel electrophoresis, all of which quantify and qualify the presence of oligomers and fibrils. Initial results indicate cholesterol stabilizes small oligomers of the peptide and further investigation into the mechanism by which cholesterol stabilizes soluble oligomers of these peptides will determine which components of the cholesterol structure are necessary for this aggregation stabilization in a cell membrane. NMR and Western blot techniques will be utilized to study any potential oxidative properties of cholesterol stabilized aggregates that may occur in cell membrane lipids, as well as complete cell studies that can show the toxicity of the peptide as it interacts with cholesterol.

Why Are Carboxylic Acids Stronger Acids than Alcohols? Contributions by Resonance and Inductive Effects

Joel P. Harvey (Dr. Joel Karty) Department of Chemistry

Carboxylic acids and alcohols are two major classes of organic compounds. The collection of atoms that characterizes a carboxylic acid, a CO_2H group, is found in amino acids as well as acetic acid—the key component of vinegar. The collection of atoms that characterizes an alcohol, a COH group, is found in sugars as well as ethanol—the type of alcohol consumed in alcoholic beverages. A molecule of a carboxylic acid can have similar structure to a molecule of an alcohol, but their acid strengths, measured in water in units of $\text{p}K_a$, are very different: The $\text{p}K_a$

of an alcohol is about 12 units lower than that of a carboxylic acid, meaning that a carboxylic acid is the stronger acid by about twelve orders of magnitude. It is important to understand why there is such a difference in acid strength between these two types of molecules because carboxylic acids and alcohols play major roles biochemically and industrially. For example, the carboxylic acid portion of an amino acid is involved in forming proteins, and a reaction between alcohols and carboxylic acids can be used to produce polyesters. In this study, the magnitudes of two contributions toward the lower pK_a of carboxylic acids than alcohols were determined—resonance effects and inductive effects. A vinyllogue extrapolation computational method was applied, and formic acid (HCO_2H) was used as a model compound for carboxylic acids, whereas methanol (CH_3OH) was used as a model for alcohols. Acidities were calculated using the Gaussian 09 software, at the B3LYP/6-311+G(d,p) level of theory. Solvent effects were taken into account by applying the conductor polarized continuum model (CPCM), assuming water as the solvent, and applying empirically derived corrections determined by Muckerman et al. Extrapolated resonance and inductive contributions toward the enhanced aqueous acidity of formic acid over methanol were found to be 5.8 and 3.6 pK_a units, respectively. Thus, inductive effects are somewhat less significant than resonance. These relative contributions in aqueous solution are similar to those determined in the gas phase in a previous study, but are smaller in magnitude.

Transformation of Metal Oxide Nanoparticles in Surface Coatings: Hazards of Inhalation and Ingestion during Application

Avery C. Hatch (Dr. Justin Clar) Department of Chemistry

Surface coatings, including paints, stains, and sealants, have recently become a focus of “nano-enabled” consumer product engineering. Nanoparticles are defined as engineered materials between 1 to 100 nanometers (nm) in size. Specifically, zinc oxide (ZnO) nanoparticles (NPs) have been introduced to surface coatings to increase ultraviolet ray resistance and resistance to wear. As more products available for purchase are made with NPs, questions arise regarding the long term environmental and human health effects of these materials. This study modeled the bioavailability of NPs similar to those found in consumer products. The initial stages of this research have focused on incubating NPs in multiple synthetic biological fluids (SBFs) in order to model inhalation and ingestion that could occur during product application and use. Control samples consisted of manufactured ZnO NPs, while experimental samples incorporated ZnO NPs into commercially available stains. Samples were taken at various time points and analyzed via Atomic Absorption Spectroscopy to determine both the total zinc concentration and the percentage of ionic zinc present to estimate bioavailability and toxicity. Zinc concentrations were found to be dependent on the SBF. In all systems smaller particles were more easily suspended than larger particles, and both suspended and ionic zinc concentrations were seen to decrease over time as incubation fluid was replenished. Future analysis will focus on products on the market that are sold containing ZnO , as well as other relevant NPs.

Study of Fluorescence and Electrochemiluminescence Quenching of Luminescens by Explosives

David Ogburn (Dr. Karl Sienerth) Department of Chemistry

Within the field of forensic chemistry, only one laboratory in the United States is used to analyze explosive composition. The testing procedure is expensive and time consuming, causing the laboratory to often run on a delay, sometimes up to four months. This delay diminishes the practicality of using explosive composition as a forensic countermeasure, because within four months most cases have either been solved or gone cold. This larger project aims to develop a more accessible technique that can be used on-site to determine general composition of explosive material. Our current work attempts to expand prior research which determined that several explosive compounds are able to quench (or effectively deactivate any unreacted agents) electrochemiluminescence (ECL) proportionally to the concentration of the explosive, within an aqueous environment. In the previous work, the reproducibility suffered, so the current work sought to examine relationships via fluorescence rather than electrochemiluminescence because data can be collected more rapidly with fluorescence. Using a plate reader fluorimeter, the relationship between quenching of luminol fluorescence and the concentration of TNT was studied. Within this examination of fluorescent quenching, two independent relationships between quenching and the concentration of TNT have been identified: one at concentrations lower than 40 $\mu\text{g/mL}$ TNT, and one above 50 $\mu\text{g/mL}$ TNT. However, we have experimentally found these two linear relationships to be independent, as their slopes differ significantly. Based off these findings, further research will be undertaken to determine the relative impact of static and dynamic quenching, along with working to optimize conditions to gain reproducibility.

Catalytic Cyclization of 1-amino-1-deoxy-D-galactitol towards a Renewable Alternative to Petroleum-based Medicines

Eleanor R. Scimone (Dr. Jennifer Dabrowski) Department of Chemistry

It is well-established that crude oil is converted to consumer energy products such as gasoline and oil by a simple refining process. Less commonly known is that the same crude oil is also transformed into many common medicines through a series of complex steps, including the formation of various ring sizes. In order to create a greener pharmaceutical industry, this research focuses on developing reactions that convert renewable resources, particularly sugars, into the same ring structures. This project utilizes a sugar currently used as a precursor to a cancer therapeutic (1-amino-1-deoxy-D-galactitol or D-glucamine). Our goal is to efficiently transform D-glucamine into a five-membered ring structure using a catalytic reaction. Two catalysts, tris(pentafluorophenyl)borane and allyltrimethylsilane, have been shown in prior findings to be necessary to alter similar sugar structures which lack amino groups (e.g., D-galactitol). Initially, the alcohols were silyl-protected to allow for a more facile analysis of reaction progress and outcome. Preliminary studies combined D-glucamine, pyridine, and chlorotrimethylsilane under room temperature conditions to afford the trimethylsilyl product. Optimization of purification techniques were conducted and toluene was found to be essential in order to isolate the desired product. The structure was elucidated by a series of NMR experiments, including proton, carbon, COSY, TOSCY, HSQC, and HMBC. Ongoing research entails optimizing the conversion of the silyl-protected D-glucamine using the co-catalysts to form the desired ring structure with respect to reaction efficiency and selectivity.

Quantifying Nanoparticle Release from Surface Coatings via Dermal Transfer

Sydney B. Thornton (Dr. Justin Clar) Department of Chemistry

A major area of growth for “nano-enabled” products has been the addition of nanoparticles (NPs) to surface coatings including paints, stains and sealants. NPs are particles defined as engineered materials between 1-100 nm in size. Zinc oxide (ZnO) NPs, long used in sunscreens and sunblocks, have found growing use in surface coatings to increase their UV resistance, although conditions under which these NPs may be accidentally removed from the coated surfaces is poorly understood. In this study, ZnO NPs of different size (20nm, 40nm, 60nm) were dispersed in either milliQ water, or a commercial deck stain. Resulting solutions were applied to both pristine pressure-treated lumber and heavily degraded pressure-treated lumber (1-year outdoor aged). Estimates of dermal transfer, defined as the removal of ZnO NPs and degradation products via skin contact, from coated surfaces were obtained using a method developed by the Consumer Product Safety Commission (CPSC) via wipe cloths. The results showed that aged lumber coated in stain-based formulations released the most total zinc release, $\sim 38 \text{ mg/m}^2$, regardless of NP size. Alternatively, pristine lumber coated in stain-based formulations released the least zinc ($\sim 7 \text{ mg/m}^2$), suggesting that the character of the coated surface (aged vs. pristine) may be the driving factor governing NP release from these products.

Analysis of Adonitol as a Resource for Future Sustainable Consumer Products

Put Usaphea Vanna (Dr. Jennifer Dabrowski) Department of Chemistry

Crude oil is a naturally unrefined source of many consumer products such as fuels, and ingredients in healthcare products and cosmetics. Since crude oil exists in a finite amount, there needs to be a replacement. Renewable resources are an attractive alternative such as readily available sugars, which can be found in nature, in living tissues, and also can be industrially grown. While research has been conducted to transform sugars (e.g., glucose, fructose, etc.) into biofuels, less research has been pursued to access more complex consumer products. The focus of this research is to determine whether various sugars are good candidates for producing the same materials that are currently derived from crude oil. Our initial studies investigated the efficiency of a three-step protocol for using adonitol, which contains five C atoms in its molecule, as a building block for the formation of a five-membered or six-membered ring. These rings are a common motif found in consumer products and are challenging to prepare from the molecules found in crude oil, requiring multiple steps. The current project is based on previous studies of six-carbon sugars utilizing tris(pentafluorophenyl)borane $[\text{B}(\text{C}_6\text{F}_5)_3]$ and allyltrimethylsilane as co-catalysts. Reaction conditions similar to those involving the six-carbon sugars were applied to adonitol, and results indicate that a five-membered ring is preferentially formed as determined by proton, carbon, COSY, and HSQC NMR spectroscopy. Purification and isolation were performed utilizing silica gel column chromatography. Current efforts are underway to optimize reaction yields and extend these conditions to other five-carbon sugars.

Iron Welding Fumes: Human Health Consequences and Potential Beneficial Reuse

Annie Yang (Dr. Justin Clar) Department of Chemistry

Many industrial welding operations produce undesired aerosolized byproducts known as welding fumes. Once condensed, the resulting solids contain a complex array of metals, metal oxides, and other chemical species such as iron. Interestingly, the physical and chemical properties of welding fumes are similar to nano zero valent iron (nZVI). nZVI is engineered iron metal at the nanoscale (1×10^{-9} meters) that has previously been utilized as a remediation strategy for both chlorinated solvents and inorganic contaminants (i.e., arsenic) in groundwater. Due to these similarities, welding fumes may serve as a low-cost alternative to nZVI remediation strategies. In this study, welding fumes provided by the Toyota Corporation were evaluated for their ability to dechlorinate the model compound trichloroethylene (TCE). Welding fumes and nZVI were mixed with known concentrations of TCE and degradation was tracked over time via gas chromatography. Initial results suggest that these welding fumes do not dechlorinate TCE to the same extent as nZVI controls, likely due to the decreased iron content (~ 30%). Additionally, potential health impacts of direct inhalation of these welding fumes was quantified by incubating welding fume samples in two synthetic lung fluids for a period of two weeks. Larger concentrations of toxic trace metals were found in artificial lysosomal fluid (ALF) compared to Gamble's solution (GS) lung fluids due to the low pH. These results highlight the potential consequences and beneficial reuse of welding fumes generated from industrial process.

Communications

Making Sense of a Celebrity Suicide: Qualitative Analysis of High-Engagement Tweets Following the Suicide of Anthony Bourdain

Jenna L. Barone (Dr. Daniel M. Haygood) Department of Communications

In nearly twenty years, suicide rates have increased by 25% across the United States (Stelter, 2018). Following a celebrity suicide, social media explodes with commentary, bringing national attention to the prominent issue. This research looks at how society and individuals emotionally process and react to celebrity suicide on social media. It provides a foundation for understanding how conversation flows following high-profile suicides so that professionals can help guide healthy conversation or integrate effective prevention strategies. The research identifies themes, theme frequencies, and theme patterns/trends present in high-engagement tweets following, in this case, Anthony Bourdain's suicide. Tweets were filtered for "#suicide" and "Bourdain" and/or "#Bourdain" to ensure relevance to the subject's death. Qualitative content analysis was used to identify thematic content present in the 50 highest engagement tweets each day for one month following Bourdain's suicide. In total, 438 tweets were analyzed, and several themes were identified and divided into five categories: references to Bourdain, consoling individuals in need, the nature of suicide and addressing suicide as an epidemic, addressing and discussing suicide as a society, and references to individuals/groups. In terms of prominent themes and trends, some were strong and present only during certain time periods, some weak overall but occurred consistently throughout the time period, and others fell somewhere in between. Results showed that the conversation surrounding Bourdain and suicide decreased rapidly after only a few days. The data suggests a small population of users continued the conversation beyond this point, perhaps looking for meaning and encouraging change as a coping mechanism for grieving Bourdain's death. For this subgroup, the data suggests the societal effects of Bourdain's suicide

became more concerning and relevant over time than the event itself. The conversation, and even individual themes themselves, evolved over time from immediate reactions to more insightful and reflective dialogue. The data also suggests emotional responses outlive news itself, and users are more likely to use positive remembrance in processing Bourdain's death rather than express sadness. Overall, the study likely reflects one potential avenue of the healing process by exploring online expression of grief following celebrity suicide.

Using Twitter Sentiment to Advice Municipal Decision Making

Anna Kathryn Cosentino (Dr. Derek Lackaff) Department of Communications

The recent eruption of real-time, accessible data describing everything from geolocation, transportation flows, and economic health to sentiment and social interaction creates a unique opportunity for municipalities to better understand the dynamics of their cities through qualitative and quantitative study. Citizens' evolving needs are exceeding the public sector's resources and governments must turn to new innovative ways to deliver services. When leveraged correctly, social media has the potential to break down barriers between municipal governments and their constituents. The open data movement, although relatively new, has the potential to be a significant force. This research introduces a web-enabled geovisual application that leverages Twitter and open government data to provide insights that can advise municipal decision making. A review of current research identified geolocation and interactivity as gaps in the current technology. This project addresses these gaps by visualizing Twitter sentiment against open data sets, such as neighborhood revitalization project locations, parks, and eviction rates on a map of San Francisco. User testing of the application reveals that by including features like a time scrubber and search filter this technology is a valid tool to help government officials and urban planners develop an understanding of what elements of their cities have an impact on citizen happiness throughout time.

Speaking Out: Exploring Alignment between Stated Corporate Values and Corporate Advocacy on Environmental and Social Issues

Rebecca C. Foley (Dr. Barbara Miller Gaither) Department of Communications

Corporate Social Responsibility is defined as a business-society relationship in which a company's operations support greater societal or economic concerns. CSR strategy is often designed to address social issues that will likely generate positive responses from consumers. Corporate Social Advocacy (CSA), however, moves beyond CSR into instances when a business takes a definitive and public stance on a controversial political or social issue. Although this trend is increasing, little academic research exists on CSA. This research seeks to address this gap in literature by exploring the prevalence of CSA among leading CSR-focused companies, as well as explore how the CSA aligns with the company's stated values. Specifically, this research examined how many of the nation's top-ranked CSR companies engaged in CSA relative to six prominent environmental and social issues (RQ1), and how their response (or lack of response) aligned with their stated values related to the issues (RQ2). Twitter accounts for 64 top-ranked CSR companies, according to the Reputation Institute and Forbes, were analyzed for instances of CSA engagement within one week following the announcement of each prominent environmental or social issue. Individual tweets were coded for CSA engagement, and then

qualitatively examined for alignment between corporate values and CSA engagement or lack of engagement. Only three events warranted CSA responses from any of the companies, and only 18 companies (28%) engaged in CSA. Qualitative analysis suggests direct alignment between stated values and response for many companies that *did* engage in CSA, while a misalignment existed for many companies with stated values that were contradicted by a lack of CSA engagement. In short, many companies publicly state their values to stakeholders, while few actually support their values with CSA. Utilizing the lens of stakeholder theory, this study created a typology of CSA-stakeholder alignment scenarios to demonstrate the various ways CSA may support or violate stakeholder expectations of a company's social or environmental positions. Finally, this study discusses the implications of violating stakeholder expectations when engagement or lack of engagement contradicts stated company values, causing companies to appear hypocritical and potentially lead stakeholders to grow skeptical of CSA efforts.

Top Global Internet Leaders Outline Key Challenges for Technology Governance

Meagan L. Gitelman & Alexandra Roat (Professor Janna Anderson) Department of Communications

What are today's most pressing networked-communications concerns or issues and how can they be addressed to ensure a better future? One hundred fifty-two of the world's top Internet leaders and innovators, hailing from 34 nation-states across the globe, answered this question in video interviews at United Nations headquarters in Geneva, Switzerland, during the 12th Global Internet Governance Forum in December 2017. The respondents were selected in a convenience sample, chosen from among the more than 2,000 registered participants in this global technology policy event. A nine-student research team from Elon University recorded several hours of responses to a set of comprehensive research questions over a four-day span, then posted the interviews online as part of the Imagining the Internet Center's ongoing documentary coverage of the evolving issues surrounding the progression of communication technologies. Among the respondents were leaders of ICANN, IEEE, IETF, ITU, governments, technology companies, and civil society groups. Interviewees represented diverse age groups and geographic, social, political and economic backgrounds. A qualitative content analysis identified the most commonly expressed issues among the 152 responses. Among them were worries over cybersecurity (with an emphasis on data privacy and protection) and concerns tied to the push-pull of the pros and cons of government regulation (including net neutrality). Solutions were suggested by 16 percent of respondents. The remarks generally centered on the need to find new approaches to enhance global digital cooperation so that common values and principles can be defined and successfully applied via appropriate mechanisms in order to work toward the best future possible at this time of rapid technological change.

Media Coverage in Colombia: A Content Analysis of New York Times Articles and Original Journalistic Report

Selina S. Guevara (Dr. David Bockino) Department of Communications

When covering international news, U.S news outlets mention the region of Latin America less than any other area of the world (Chang, 1998). Studying media coverage of Colombia fills an important gap in news content analysis literature. This SURF presentation contains two parts: a

traditional content analysis and a journalistic project which was informed by the content analysis and aims to tell original stories with different themes than the ones found in the content analysis. The content analysis looks at all news articles from *The New York Times* with “Colombia” in the headline from January 1, 2013, until December 31, 2018. It pinpoints what the major themes of coverage have been over the past five years and how, if at all, the coverage has changed. An inductive approach was used to determine the major themes of coverage, complemented by a quantitative analysis using the tags from ProQuest to count the most frequent organizations, people, and topics tagged in the articles. The most common tagged themes were guerilla forces and peace negotiations, tagged in 37 articles, and the most commonly tagged organization was the FARC, in 62 articles. In 2013 and 2014 there were more short news briefs about violence than the other years, and there was a spike in editorials as well as a diversification of reporter bylines starting in 2016 when the peace negotiations were happening. Overall, a wider diversity of coverage themes was found in the later years. The journalistic project is a four minute video that will be shown during the presentation about economic revitalization and the changing role of women in parts of Colombia hit hard by violence from guerilla fighting groups in the ‘90s and 2000s. It was produced during a ten-day visit to La Union, Colombia, a small town about 60 km outside of Medellin which used to have a mostly potato farming economy but now has shifted to more diverse crops such as flowers and has more small businesses. Ten interviews were conducted on-camera, and several more off camera and on background, with local business owners, workers, government officials, and an economic developer.

Knowledge, Attitude, Practices and Insight of the Children and Adults Who Survived a Natural Disaster

Lucía Jervis (Dr. David Copeland) Department of Communications

Ecuador experienced a 7.8 magnitude earthquake in April 2016. Almost 700 people were killed, 30,000 were injured, and coastal areas were destroyed. The epicenter of this earthquake was in a coastal town called Pedernales. Unfortunately, for a natural disaster, media reports were largely quantitative. Statistics failed to depict the suffering and plight of victims. My project is a qualitative study seeking to portray the sentiments and experiences of survivors, with the hope that they can share their testimonies and convalesce while promoting a sense of empowerment and autonomy. Interviews were conducted with 21 survivors at three stages - two months, a year and two years after the earthquake. The interviews serve to depict Ecuadorians’ personal growth throughout time, level of resiliency, healing process of divulgence and the reconstruction or lack of reconstruction of lives. These survivors are all from small towns with few resources. These towns are El Churo, El Cañaveral, El Aguacate and the town at the epicenter of the quake, Pedernales. El Churo and El Aguacate are so small that many Ecuadorians would not be able to locate them on a map. Furthermore, it is important that the stories of the people who at first had to rebuild their houses with plastic sheets because other resources were not available are known, so that even years after the earthquake, it might be possible for them to receive aid. Moreover, studies by scholars (Leary, Mitchell, Ritchie, Wilson, 2009) suggest that sharing stories after traumatic events serves to assist the healing process for victims (Bahamonde, Cordero-Reyes, Egas, Grunauer, Palacios, Ramia, Rodas, Valencia, West, 2016), hence, the interviews conducted also serve as a way for survivors to be able to share their stories with the hopes that this will help with their healing progression. This project compiled all the interviews in a book, written in Spanish and English. The testimonies were largely positive, as all the survivors of this

earthquake who were interviewed, rebuilt their homes and lives and overcame or are working toward overcoming their fears and trauma.

Telling the Stories of Trauma Survivors: How Journalists Navigate Interview Relationships in News Reporting

Deirdre G. Kronschnabel (Dr. Glenn Scott) Department of Communications

The relationship between reporters and interview subjects who have experienced recent traumas is a timely and delicate area of study. It prompts questions about journalistic ethics as they relate to reporters' treatment of vulnerable sources, reporters' duty to bear witness to suffering, and reporters' willingness to expose sources' voices as a means of serving the public. This study seeks to determine how reporters approach and conduct interviews with trauma victims using narrative theory (Kim, 2016) to understand the layering of stories told by the victim to the reporter, the reporter in their written work, as well as from reporter to the researcher. This research differs from prior scholarship on trauma reporting, which generally examines the psychological effects on journalists who witness traumatic events as they unfold (Seely, 2017). Instead, this research concentrates on (a) the relationship that develops during the interview process and (b) the specific interactions that take place between reporters and interviewees that lead to the construction of a story. The study examines the social skills and ethical decision-making unique to journalistic practices. Using qualitative methods, the researcher conducted in-depth interviews with 12 professional journalists who communicated their ideas and experiences about interviewing trauma victims, and how they worked to gather and tell their stories humanely. The interview transcripts were analyzed using narrative theory; results revealed five categories: *interviewing behavior and mechanics*, *developed skills and lessons learned*, *being human*, *the journalists' dilemma*, and *the larger story*. The findings contribute to a deeper understanding of how journalists make meaning of their interactions with people who are vulnerable, expanding on worthy practices and universal techniques for interviewing trauma victims. The researcher found that for all the skill and intricacies employed during sensitive interviews, reporters acknowledged the published piece is only a partial narrative of the victim's story.

Society-Driven Responsibility: Corporations beyond CSR

Stefanie R. Milovic (Professor Lee Bush) Department of Communications

Over the past 30 years, corporate social responsibility (CSR) has increased exponentially through partnerships between businesses and charitable causes (Wymer & Samu, 2009). CSR has now become an expectation among stakeholders (Sherman, 2018), and younger consumers like Generation Z have advocated for corporations to take CSR to the next level and lead the charge on broader and potentially controversial social, political and environmental issues (Havas Media, 2011). This research examines the corporate shift from CSR to "society-driven responsibility" (SDR) and investigates how corporations are already approaching SDR. It will provide insight into the professional implementation of SDR with the purpose of assisting corporations in deciding whether to pursue it in the future and how to do so. The data was collected qualitatively through case study and interview methodologies and analyzed using grounded theory and the constant comparative technique. To examine the overarching trend of SDR, phone

interviews were conducted, recorded, and transcribed with experts from five different communications agencies (Ketchum, Cone Communications, McPherson Strategies, APCO Worldwide, and Fenton). An additional two phone interviews were held with top leaders of national corporations (Ben & Jerry's and Replacements, Ltd.) to explore their companies' specific approaches toward implementing SDR. To further investigate corporate approaches, six case studies were analyzed: Dick's Sporting Goods, Nike, Chick-fil-A, Hobby Lobby, Starbucks, and Mars Company (Skittles). Findings confirm a clear trend from CSR to SDR with increasing public support for corporations pursuing SDR. Additional findings establish the following: 1) SDR must be authentic and values-based; 2) trend motivators include Generation Z and the current U.S. government; 3) benefits and risks include amplification of message, sales, hiring and employee retention, and brand loyalty; and 4) SDR is manifested differently by companies under conservative and liberal leadership. The findings point to a decision-making process for companies to consider before pursuing SDR such as social media listening, analyzing consumer audiences and preferences, engaging employees before customers, and making decisions among several departments beyond the C-suite. Research findings lead to conclusions that corporations should pursue SDR and take well-defined stances on social, political and environmental issues using a "proceed with caution" mentality.

How Do Gaming Streamers Develop Their Brand? A Look into Channel Recognition and Audience Rapport among Twitch and YouTube Streamers

Gilbert H. Schultz (Dr. William Moner) Department of Communications

Live streaming is an emerging practice in the entertainment industry primarily among video game players. Many "streamers" have wide audiences, and some even make millions of dollars a year playing video games through donations and advertising placed on their videos on platforms including Twitch and YouTube. The streamers that attempt to build an audience on these platforms cultivate a brand that indicates what that channel is about and who is involved, usually identified by a channel logo and the personality presented by the brand. Many scholars have addressed video game live streaming and brand theory separately, but have sidestepped observing both simultaneously. In order to fill this gap, this study employs mixed methods and is analyzing the development of 12 streamers' brands on YouTube and Twitch. More specifically, qualitative, semi-structured, case study interviews with streamers are being conducted to see how individual streamers design their brands and how these brands are developed. Secondly, quantitative content analysis is being further conducted through emergent coding software to analyze the streamers' channel chat logs in order to provide information on how audiences are experiencing the brands and their effectiveness. Finally, a quantitative analysis of channel analytics is being used for comparison with findings from the interviews and chat logs to understand if the channel's brand successfully attracts the demographic the streamer is trying to pursue. Channel analytics include information such as audience demographics, which is available for streamers to download from their accounts. This research is still a work in progress but preliminary hypotheses are forming. One such hypothesis is that lower profile streamers put less resources into designing their logos compared to higher profile streamers. Audiences of lower profile streamers will mention channel branding less compared to audiences of higher profile streamers. As the next few months progress, more research will be conducted and findings and implications will be more available.

Examining the Impact of Systemic Racism on Expressions of Masculinity in Hip-Hop Music Videos

Matthew R. Simmons (Professor Nicole Triche) Department of Communications

While research surrounding hip-hop has grown alongside its popularity, the majority of scholarship restricts its focus on expressions of masculinity to the images and lyrics of hip-hop videos, rather than to larger historical contexts that have informed them. This project takes an in depth look at systemic racism and its impact on expressions of masculinity in hip-hop music videos, through a historical overview and literature review that inform the creation of two music videos. The written work focuses on providing a timeline of major historical events, their impact on black masculinity, and how they have shaped expressions of masculinity in hip-hop music videos. Based on the research, two main areas were chosen to explore in video form: systematic disenfranchisement and physical violence against black men. The researcher collaborated with local hip-hop artist Will Henderson to write video treatments on these main themes. *Novacane* follows the story of two children who find a black man in a field with an auxiliary audio port impaled in his chest. They plug headphones into the port, and hear his struggles with resisting the institutions pitted against him. *Perspective* takes the viewer through different futures that American society offers black men, and their potential outcome. These treatments went through multiple rounds of revision including review by men of color in the film and music industries. The videos were produced throughout October and November of 2018, and also underwent a series of revisions conducted by men of color and faculty members at Elon University. Upon completion, the films will be premiered in Turner Theatre, submitted to festivals, and distributed across multiple digital platforms, including Will's social media and professional profiles. The project will be released in conjunction with the two singles accompanying the videos, in order to draw attention to the ideas expressed and Will as an artist.

Pregnancy in Film: How Do Filmmakers Demonstrate Industry Portrayals of Pregnancy and Childbirth in Modern Films?

Wynter Wates (Dr. Naeemah Clark) Department of Communications

This research is an analysis of filmmakers' narrative and aesthetic decisions in fictional feature films about pregnancy and childbirth. This critical analysis of filmmakers' depictions of 11 women from seven feature films focuses on the portrayals of pregnancy and childbirth and will posit ideas of how these depictions can shape expectations of childbirth in the mind of the viewer. To be included in this study, the films had to have been released in the past 15 years and had to feature a woman experiencing pregnancy and childbirth over the majority of the film. An emergent coding sheet was developed based on the various aspects of characterization, narrative, and aesthetic components pertaining to each woman throughout her story and later analyzed for patterns across all films. Analyses identified four major components of films used to portray pregnancy: the role of agency versus powerlessness, acceptance versus stigmatization, the language around science, and cinematic aesthetics. This analysis focused on identifying aspects in the portrayals of pregnancies and childbirth that are realistic or exaggerated for the sake of the viewers' entertainment. For example, in some cases, women are portrayed as being powerless, pregnancy is viewed as a minor disruption to a woman's body, and birthing scenes downplay the length of the delivery. It is important for filmmakers to understand the role and responsibility

they have to find the balance between realistic and entertaining depictions in order to not misinform viewers and shape their expectations incorrectly. Since there is very little research that has already been done about pregnancy and childbirth in film, this research can serve as a contribution to a better understanding of the responsibility filmmakers have to present complete and accurate depictions.

The Framing of Refugee Status and of Refugees through U.S. Presidential Discourse Following September 11, 2001 until September 11, 2018

Kimberly Asin Wilson (Dr. Vanessa Bravo) Department of Communications

The topic of refuge and asylum seekers has again come to the forefront of the United States national conversation as the Syrian conflict continues on its 8th year, since 2011, and several thousand Central American migrants and asylum-seekers have journeyed to the country's southern border in 2017 and again in 2018. This study analyzed the framing of refugee status and refugees by U.S. presidents since the terrorist attacks of September 11, 2001 until September 11, 2018. With framing theory (DeVreese 2005; Entman 1993) as its theoretical framework, a qualitative content analysis was conducted to evaluate the U.S. presidential discourse of George W. Bush, Barack Obama, and Donald Trump on refugee status and refugees in a total of 72 speeches collected from their respective administrations' official websites. This study analyzed what was said, and how, by each leader of the United States in the timeframe outlined. The coding process, upheld by a satisfactory intercoder reliability level of 93.3 percent, sought to identify the presence of generic frames (DeVreese 2005) such as Conflict, Human Interest, Responsibility, Morality, and Economic Consequence. Although Bush and Trump are both Republicans, while Obama is Democrat, this research shows that Bush's and Obama's references to refugee status and refugees were very similar, emphasizing a national responsibility to assist, while Trump adopted an opposite stance on the issue of refuge and the human worth of refugees, focusing on the danger they could bring. The topic of how our political leaders talk about and frame the issue of refugee status and of refugees in the U.S. is not only relevant, but urgent, as the lives and livelihoods of generations of people are impacted by the president's decisions on the cap of refugees accepted each year to the United States as well as the resources available to them.

Computer Science

Computational Gerrymandering: Algorithmically Drawing District Lines for Fair Elections

Jack Amend, (Dr. Scott Spurlock) Department of Computer Science

Gerrymandering has become a hot topic in North Carolina; the United States Supreme Court will be hearing arguments on whether or not the districts in North Carolina are unconstitutional. The term "gerrymandering" is named after Elbridge Gerry after he famously drew district lines in Massachusetts where one looked like a salamander, and thus the name "gerrymander" was born. Gerrymandering has the ability to change the outcome of elections by either *packing*, grouping together the constituents of the opposing party in one district to weaken their count in several other districts, or by *cracking*, dividing large groups of opposing constituents into many districts

so they can be easily outvoted. The aim of this research is to explore a fair and reliable way to draw district lines that conform to the law. Census data blocks will be used to identify small groups of people who are near. These blocks will allow us to combine similar ones together. We will then attempt to draw district lines to minimize travel time from one block to the center. Other projects have considered a variety of different criteria (e.g., geographic distance) to draw boundaries. However, large natural barriers, like lakes, mountains, and rivers, are not accounted for when drawing lines strictly based on straight-line distance. By incorporating travel time into the criteria for drawing districts, we hope to be able to automatically create fair districts.

Collision Avoidance System for Unmanned Aerial Vehicles Using LiDAR and Optical Flow

Jack J Amend & Mason C Seeger*(Dr. Richard Chapman[†], Dr. Saad Biaz[†]) Department of Computer Science

* DePauw University's Computer Science Department

[†] Department of Computer Science and Software Engineering

With the rise in popularity of unmanned aerial vehicles (UAV), automated collision avoidance is becoming essential. Advancements in technology are making light detection and ranging (LiDAR) and computer vision-based collision detection viable for small UAVs in a variety of different environments. These systems can be used on tiny and cost-effective computers, such as the Raspberry Pi. Existing methods for collision avoidance have included visual and non-visual sensors that have strengths and weaknesses. Even though the identification of interest points needs to be improved upon, the results show promise for a cheap and reliable system for dynamic object avoidance for use in small UAVs. This poster explores the feasibility of a combined system that combines LiDAR and computer vision with computations to be performed on a small embedded computer. (This research was conducted at Auburn University a part of the Research Experience for Undergraduates during the summer of 2019. The research was funded by the National Science Foundation and the Department of Defense.)

Understanding the Role of Corporate Participation in Open Source Software Communities

Jack M. Hartmann (Dr. Megan Squire) Department of Computer Science

Free, Libre and Open Source Software (FLOSS) has become increasingly important to a technology-driven world. FLOSS products all have a software license that explicitly gives the user the freedom to use, share, study and modify the software, including its source code. This user-oriented focus meant that initially many FLOSS projects were small "hobby" projects with one or two core members. Nowadays, blue chip software companies such as Samsung, Microsoft, Facebook, Google, IBM and HP are hiring software engineering teams specifically for the purpose of working on FLOSS projects. FLOSS projects have a core set of values, with one of the values being "diversity" amongst project members and ideas. The Apache Software Foundation is one of the most established FLOSS Organization and works as the sample for the analysis of diversity. When treating FLOSS projects and organizations as a two mode social network, structural holes and clustering metrics can visually and quantitatively describe different communities and their corporate diversity. Our results show some large companies are crucial to the current social network structure of ASF. Additionally, certain projects have less corporate

diversity, leading to the potential of uneven influence. Findings will help the FLOSS community as a whole to better understand the impact of growing corporatization of FLOSS projects.

The Effect of Quick Release and Dwells Time on Encumbered Interaction

Sam Jimenez (Dr. Duke Hutchings) Department of Computer Science

As smartphones get more advanced, there are changes and improvements on how to interact with them. Consider for example a button. For some time, a button could be only clicked or tapped to indicate a specific action. More recently, phone touchscreens can sense the pressure exerted by the user and can use different amounts of pressure to indicate different variations of an action. The current barrier for widespread use of pressure input is how to let users accurately, quickly, and confidently indicate the desired variation based on the force applied. Common methods include holding a certain force for a specified time period. This is known as Dwell. A more recent alternative to this is known as Quick Release, where the user applies the desired force and then quickly lifts their finger to select the action. Research has shown that Quick Release is a promising technique, however in this past research participants have been in non-mobile scenarios such as sitting in a chair. An equally common scenario is a mobile user, such as someone walking while both holding a bag and interacting with the phone. We endeavor to augment the research on Dwell and Quick Release techniques with users interacting in a truly mobile, encumbered situation. Specifically, we have designed a mobile app that senses 5 levels of pressure and presents the user with a button that must be activated with a specific pressure level. The app systematically varies the button location and necessary level pressure to activate the button to examine effects of pressure levels and on-screen location and captures user interaction data. We have designed an experiment that incorporates this app with participants walking at a controlled, leisurely pace and holding bags with a fixed weight. As of March 1, 2019 we have completed initial experiment piloting and have submitted our refined experimental protocol to IRB. By SURF day, we will have collected and analyzed our preliminary data in a manner that can be presented.

Comparing Physical and Virtual Educational Practices

Danielle L. Marzullo (Dr. Shannon Duvall) Department of Computer Sciences

This study is a multidisciplinary look into the pros and cons of using digital tools in education. Currently, there are a variety of educational software and digital programs used to encourage learning in classrooms. However, most of the software is designed in the same way - around a structure that “tends to dictate a sequence of actions” instead of allowing the child to control it with his or her mind or body (Keay-Bright, 2008). For many children, the immediate feedback and interactivity provided by the use of digital applications provides an extra level of motivation, engagement, and interest. In addition, students with physical or cognitive disabilities can be engaged with digital tools in ways they cannot with traditional means in the classroom. To compare student engagement with traditional and digital activities, we designed an experiment with two trials, one using the traditional physical medium of teaching color mixing with finger-paint and another using the virtual paintbrush application developed by Computer Science students at Elon University. Our hope was that through the trials we could study the outcomes of

teaching children about color mixing using two different tools. We had a combined total of eleven preschool-aged participants gathered from the local children's museum. During the first day, five participants approached the table and used the physical medium of finger paint. On the second day, six participants used the magic paintbrush tool which was set up using a laptop and a poster board with colored swatches. As participants pointed to a color swatch on the poster using a paintbrush, the screen on the computer would splatter that paint color. Participants could add and take away colors as they wanted. The results showed a longer duration of engagement with the physical medium of finger painting. However, all participants except one showed many signs of enjoyment for both the physical medium and the digital tool. When using the virtual tool, participants asked more probing questions. As a result of this study, we are able to provide data to aid both members of the Computer Science Department and the Department of Education and Wellness by field-testing both the software and theory involved in learning in virtual environments.

Economics

The Impact of Political Protests on National Football League Television Ratings

Judah Brown (Dr. Brandon Sheridan) Department of Economics

This research determines how much, if any, of the recent decline in the National Football League's (NFL) television ratings can be attributed to national anthem protests inspired by Colin Kaepernick. Much of the existing research on sports (i.e., association football, American football, and baseball) and television ratings identify factors such as team quality, "star power" of players, and amount of scoring as reliable predictors for ratings. However, none of the existing research includes protests as a potential factor. The data analyzed includes aggregate Nielsen ratings and streaming statistics for the four NFL seasons between 2014 and 2017, which covers the two years before and the first two years of the protests. In addition to the protests, variables analyzed include five general categories of demand determinants for sports—preferences, price, quality of viewing, characteristics of the contest, and supply capacity. These variables were then analyzed in a series of ordinary least-squares (OLS) regression models. Preliminary regression results indicate that protests do contribute to the decline in NFL TV ratings, but their impact is not as consequential as other variables such as the team's record or the time slot in which the game is played. This research identifies and fills a gap in economic knowledge, and sheds light on the possible connection between economic rationale and the effectiveness, or even utilization, of social protest.

The Impact of Water Quality on the Value and Size of the Blue Crab Fishery in the Chesapeake Bay

Jacob K. Crouse (Dr. Brooks Depro) Department of Economics

The Chesapeake Bay, once one of the most productive fisheries regions in the United States, has experienced a decline in the blue crab population for several decades. Upstream factors such as river erosion and the overuse of fertilizer have contributed to deteriorating water quality. Although blue crab populations and the value of the fishery fluctuates from year to year, data

from the National Marine Fisheries Service (NMFS) indicate that the 2017 blue crab harvest was valued at \$73.7 million making it economically important for surrounding states. Past researchers have found that an important water quality measure, low levels of dissolved oxygen, leads to declines in populations of aquatic species. Using harvest value data from NMFS, population data from the Maryland Department of Natural Resources' Winter Dredge Survey, and water quality data from the Chesapeake Bay Program, I will study the impact of water quality on the blue crab population and the price of blue crabs in the Chesapeake Bay between 1990 and 2017 by running several regressions. It is hypothesized that as the amount of dissolved oxygen in the water decreases, the commercial harvest of blue crabs will decrease. Based on past research findings, I am also expecting the price of blue crabs to increase as water quality worsens.

The Effects of Dispensaries on Surrounding Real Estate Values

Carson C. Fawzi (Dr. Tonmoy Islam) Department of Economics

Since the legalization of recreational marijuana in 2012, the Denver metro area has exploded with dispensaries, holding 177 dispensaries within the 155 square miles. While rapid growth has occurred, there is still little research as to the effects that these are having on the surrounding neighborhoods. The National Association of Realtors asserts that three quarters of residential realtors saw no change in residential property values near dispensaries while one tenth have observed an increase, and 12 – 14 percent observed a decrease (MacNeill, 2018). In this study, I provide additional evidence on this question, identifying the effects of dispensaries on surrounding residential real estate values. I created a dataset using Zillow, Colorado State Government dispensary data, and Google Maps API. I use a hedonic regression analysis, a method commonly used in the housing literature, to estimate the marginal contribution of individual characteristics on home values (Sirmans, 2005). I hypothesize that dispensaries are perceived as a negative amenity; therefore, homes that are in the immediate proximity would reflect a lower home price. Results suggest that for each additional mile a home is from a dispensary, list price falls by 8.95%. When observations above \$2,000,000 are excluded, home price falls by \$50,693 for each additional mile away from the dispensary location. Further research is needed to fully understand the externalities associated with dispensaries.

Impacts of Contraception on Women's Decision-Making Power in Indonesia

Michaela J. Fogarty (Dr. Steve DeLoach) Department of Economics

Increasing access to contraception has the potential to empower women and improve the economic standing of families across the globe. Many researchers have explored the impacts of contraception on families and the determinants of women's level of empowerment, but little scholarship exists on their direct relationship. In this paper, I explore the impacts of contraceptive use on women's empowerment, measured by an index of women's household decision-making power. I use panel data from three rounds of the Indonesian Family Life Survey to run multiple regression with household fixed effects. I find that women who use contraception have input on over two additional household decisions, compared to women who do not use contraception. Though additional research is necessary to prove causation and further understand

this relationship, these preliminary findings suggest that use of contraception increases women's decision-making power in their households.

The Gender Gap in STEM Fields: Female STEM Student Attrition

Camille Marie Kelley (Dr. Katy Rouse) Department of Economics

Innovations rooted in science, technology, engineering, and mathematics (STEM) have resulted in notable economic growth in the United States over the past few decades, leading to an increased demand for STEM professionals (Hossain, 2012, p. 442). Due to stagnation in the domestic production of STEM-qualified workers, this increased demand is currently being fulfilled by foreign-born workers (Hossain, 2012, p. 443-448). In addition to this stagnation, the United States has also experienced a persistent gender gap within STEM labor force participation and educational attainment (Dasgupta, 2014, p. 21). According to the report on women in STEM by the U.S. Department of Commerce's Office of the Chief Economist (2017), roughly half of the United States' undergraduate degree holders are women, yet only 30 percent of the United States' STEM degree holders are women. Similarly, women constitute 47 percent of the United States' labor force, but just 24 percent of U.S. STEM workers (Office of the Chief Economist, 2017, p.1). While both STEM attrition and female underrepresentation have been researched extensively, there has been little generalizable research into female STEM attrition (Beasley, 2011, p. 427). With this in mind, I analyze data collected within the National Center for Education Statistics' High School Longitudinal Survey of 2009 to identify the driving factors contributing to female STEM attrition rates, which I define as the proportion of students who expressed interest in a STEM major but earned a bachelor's degree in a non-STEM field. After accounting for sample selection bias using the Heckman correction method, I find that the female STEM attrition rate is 6.5 percentage points higher among more selective universities, and 10.7 percentage points higher among students who work for pay while at school. Further, I find that female STEM attrition decreases if, while in high school, a female student perceives herself as a math person or that females are better than males at science. Lastly, I find the female STEM attrition rate is 7.9 percentage points lower among students who live on campus while working towards their degrees.

The Effects of Mental Health on Academic Achievement of College Students

Erin E. Kelly (Dr. Katy Rouse) Department of Economics

The rising prevalence of mental health issues among students in higher education is one of the most pressing concerns facing undergraduate institutions. According to a survey conducted by the Center for Collegiate Mental Health (2018), between 2009 and 2015, the number of students visiting counseling centers increased by about 30% on average, with anxiety and depression cited as the most common concerns. This continual upward shift is particularly worrisome in light of the probable impact mental health has on student academic performance. A recent study finds that adolescent depression is positively correlated with dropping out of high school and negatively correlated with enrolling in higher education (Fletcher, 2008). More specifically, Ding and colleagues (2007) find that depression leads to significantly lower GPA among high school students. Despite growing concerns over student mental health in universities across the U.S. and

the likely effects these issues have on student performance, the economics research on this question is notably sparse. To my knowledge only two studies specifically look at the link between mental health outcomes and GPA in college students. Hysenbegasi et al. (2005) find a diagnosis of depression is associated with a 0.49 point decrease in student GPA, and Eisenberg et al. (2009) conclude depression has a significant negative association with GPA. However, both studies have small sample sizes across short ranges of time. Using regression analysis and data from the American College Health Association's National College Health Assessment between the years 2011 and 2018, I investigate the impact of mental health on academic achievement of college students. Given the documented growth of depression, anxiety, and eating disorders, the paper gives particular attention to these conditions. Preliminary results show a small, positive relationship between mental health and GPA, suggesting higher achieving students may be more likely to have these conditions. Further, the data shows an increase in the prevalence of these disorders over time, alongside an increase in the effect these disorders have on specific academic outcomes. This research has considerable potential in highlighting the importance of future policy interventions on mental health disorders across college campuses.

The Impact of Village Loan and Savings Associations (VSLAs) on South Sudanese refugees and Ugandan citizens in Northern Uganda

Luz R. Mendoza (Dr. Steve DeLoach) Department of Economics

The purpose of this research is to determine the economic and social impacts of participation in Village Savings and Loan Associations (VSLAs) on South Sudanese refugees and host citizens in Northern Uganda. This is valuable as there is little research on the impact of savings in Sub-Saharan Africa or research that focuses on the VSLAs on refugees and the effectiveness of microfinance on refugees. We collaborated with a non-governmental organization called Seed Effect to assess the impact of their VSLA program. The survey, administered by Seed Effect, assessed the impact of savings and loans in the overall quality of life of the participants. It looked at social factors such as number of children in school and economic factors such as value of the participant's animal assets. Regression estimates show that refugees tend to borrow more, specifically on school fees, than non-refugees. Furthermore, an increase in the amount participants are allowed to save in each period decreases the ability for many participants to save and borrow, limiting the positive impact of the VSLA. The results suggest that Seed Effect could increase their impact by limiting the value of each share chosen by savings groups.

An Analysis on the Relationship between Obesity and Income

Rodrigo M. Pires (Dr. Mark Kurt) Department of Economics

This paper attempts to understand the relationship between obesity and wages. Previous studies have shown mixed results about the relationship. Further, some studies even argue that it is optimal to be close to the obesity threshold (BMI greater than or equal to 25). Studies related to the topic have also analyzed the obesity trend historically to predict future obesity rates. Previous literature estimates that by 2048, all Americans will be considered obese. The majority of the studies performed to date on this field only analyze the NLSY79. However, seeing that eating habits, calorie intake and consequently BMI have all dramatically changed in the past decades,

this study will use data from the most recent cohort, NLSY97. Preliminary OLS results indicate that an increase of 50 pounds in an individual's weight yields a decrease of 2% in annual income on average. Previous studies failed to control for the industry, occupation and field of study in college of the respondents. This study will provide a perspective of how obesity and wages relate to the field of study, work area and occupation of the individual. This control will ultimately allow for a deeper and more valuable analysis of how the wage penalty/advantage changes for an individual as these characteristics change. Potential endogeneity through reverse causality between weight and income is controlled with the use of instrumental variables.

The Relationship Between Education, Experience, and Political Productivity

Hannah M. Quinlan (Dr. Vitaliy Strohush) Department of Economics

Enacted legislation signed into law during a congressperson's career is a measurement often associated political productivity in the US House of Representatives. A bill is considered enacted if one of the following is true: a) it is enacted itself, b) it has a companion bill in the other chamber (as identified by Congress) which was enacted, or c) if at least half of its provisions were incorporated into bills that were enacted. The purpose of this paper is to test whether there is a relationship between education, experience, and political productivity within the House of Representatives from 1973-2018. Based on the human capital theory, I hypothesize that graduate or formal law education and relevant pre-congressional experience should lead to success in office. Pre-congressional careers in private practice increased enacted legislation by 1.35, state legislature experience increased enacted legislation by 1.50, and military experience increased it by 1.29, presenting a positive correlation with political productivity like initially predicted. The results also show that representatives with graduate education actually enacted 1.34 fewer pieces of legislation than those without a graduate degree, and a law degree is insignificant. These results suggest that a Representative's educational background is less important than experience, and pre-congressional experience, such as private practice, state legislature or military careers are more strongly related to passing bills.

The Effects of Micro-Insurance on the Poor's Ability to Smooth Consumption

Katelyn S. Roache (Dr. Steve DeLoach) Department of Economics

The world's poorest citizens often face unexpected risks, from natural disasters to unexpected illnesses. Without resources to rely on, these risks can have devastating results for those already living in poverty. This paper examines the following question: How does the presence of insurance allow the poor to guard themselves against unexpected risks? In the face of an adverse shock, people often smooth their consumption using various techniques, such as drawing from their savings or selling off their assets. While other papers have examined consumption smoothing in the context of various micro financial services, such as micro savings and microcredit, this paper examines the impact of micro insurance. To analyze how households respond to health shocks, this paper uses data from the 2007 and 2014 Indonesian Family Life Survey (IFLS), which contains data from individual households, alongside data from village leaders about their respective communities. I use this data to examine whether insurance impacts a household's probability to save. Using multiple regression analysis with fixed effects, I find

evidence that access to insurance during a health shock has a positive impact on a household's probability of saving. It seems that insurance could have the ability to help the poor manage unexpected risks. Insurance could be a viable option for the world's poorest population and increasing access to this financial resource could transform people's quality of life.

The Effects of Divorce on Parental Investment and Children's Later Life Outcomes

Morgan G. Valeo (Dr. Katy Rouse) Department of Economics

About 50% of all American children will witness their parents' marriage end in a divorce. Of those children, 50% of them will see their parents' second marriage also end in a divorce (Furstenberg, Nord, & Peterson, 1983). Previous studies have confirmed that adult children of divorced parents have a lower well-being than those who have parents who've been continuously married (Amato & Keith, 1991). For example, results from a recent study found that children who lived with a step-father, single mother, or in families where parents had conflict in their marriage, reported higher symptoms of psychopathology at 21 years old (Hayatbakhsh, Clavarino, Williams, Bor, O'Callaghan, Najman, 2013). Although there is evidence documenting the negative effects of divorce on children's well-being, less is known about the mechanisms through which this occurs. This study narrows the gaps in the literature by examining how parental investments are affected by marital status. The data used in this study comes from the National Longitudinal Survey of Youth from 1979 (NLSY79). This dataset follows children and their parents from 1979 until 2014, which allows for the observation of trends over time. From the NLSY79 dataset, the study is able to evaluate several measures of parental investment in their children (such as how often they help their children with their homework or how frequently parents discuss with their children about going to college) and how these investments differ according to marital status. In addition to investigating the role divorce plays on parental investment, the study also examines how it may affect a child's education and future earnings.

Education & Wellness

Beyond Science in Environmental Education: Examining the Effects of Teaching Math Outside

Mirella F. Cisneros Perez (Dr. Scott Morrison) Department of Education and Wellness

According to Louv (2005), children are spending less time outside compared to previous generations. One of the purposes of environmental education is to disrupt this trend (Sobel, 2012). As a future math teacher, I am interested in the effects of teaching math outside, and specifically how it impacts students' learning of mathematics and their connection to nature. Studies show that spending time outside has numerous cognitive, psychological, and emotional benefits (Atchley, Strayer, & Atchley, 2012; Berman, Jonides, & Kaplan, 2008; Berto, 2005; Li, 2010; Faber Taylor & Kuo, 2009). Research has also shown that incorporating mathematics in real-life environmental situations helps students understand abstract mathematical concepts (American Association, 1989; McBride & Silverman, 1991). Recently, the National Council of Teachers of Mathematics (NCTM) published an article about kindergarteners learning math in natural spaces (McLennan, 2018). The students used their curiosity about the environment to

observe and wonder about the mathematics surrounding them. My research project seeks to extend this kind of learning to other age groups. I conducted a case study (Merriam, 2009) with over 40 middle grades students at three schools in central North Carolina. My research questions were as follows: *How connected do middle school students feel toward nature? What do they think of going outside for academic purposes during the school day? More specifically, what do middle school students think about learning math outside?* All participants completed a survey that included demographic information and modified questions from the Nature Related Scale (Nisbet, Zelenski, & Murphy, 2008). Participants were interviewed before and after a series of at least three math lessons that occurred outside. Analysis of the data suggest that students respond favorably to learning math outside, with most reporting that they are able to focus more easily and understand math concepts more deeply. Conclusions from this study will be of interest to teachers and teacher educators seeking to integrate math and environmental education.

Instagram Microcelebrity and Educators' Uses of Instagram

Madeline B. Craft (Dr. Jeffrey Carpenter) Department of Education and Wellness

In recent years, various social media platforms have become integral to educator professional development and networking. The widely used social media service Instagram has received little attention in prior research. Instagram's visual nature allows for quick information sharing and creates a window into classrooms. Instagram also provides a space in which some educators can develop a large following and achieve microcelebrity (Marwick & boyd, 2014) status. This research attempts to fill a gap in literature by addressing the following research questions: How and why do educators use Instagram for professional purposes? What are opportunities and challenges associated with teachers achieving microcelebrity status on Instagram? In order to answer these questions, data were collected using a survey. Survey items were brainstormed and consolidated through rounds of discussion and feedback, and the survey was disseminated via multiple social media platforms. We received 841 responses. Eighty-seven percent stated that a major reason for Instagram use was to look at ideas and content shared by other educators, reinforcing the idea that the visual nature of content sharing is valued. Interestingly, a much smaller percentage of users (35.53%) indicated that sharing their own ideas and content was a major reason for their Instagram use. Learning about and understanding why educators use Instagram can provide insight into self-directed professional learning that educators are participating in outside of their schools and conferences. Follow-up interviews are being conducted based on pertinent survey data and questions that were not able to be addressed fully in the survey. Interviews will explore the experiences of educators who have achieved microcelebrity status on Instagram. These educators are interesting case studies because of how they are using social media to extend their role and impact as an educator beyond their individual school and district. The results of this research will help build understanding of the perceived advantages and professional usefulness of platforms such as Instagram that were not intentionally designed for the professional development of educators.

Perceptions of Service Learning

Julia M. Field (Dr. Jennifer Eidum) Department of Education and Wellness

Currently, there is very little scholarly research on international students and service learning. However, based on previous research on service learning by James Minor (2002), the effects of the service learning for international students is positive. Although, no known research has examined the difference in perception of service learning amongst domestic and international college students. This study asked both international and domestic students at Elon to respond to a survey on their perceptions of service learning at Elon and abroad. Throughout the study, domestic students are those who defined the United States as their primary country of residence, whereas international students are those who defined their primary country as residence as outside of the United States.

To conduct this study, we invited students to complete a survey via email, using the Isabella Cannon Global Education center, the Kernodle center, Elon Core Curriculum, and international Living-learning community to reach students. Both international and domestic students were invited to complete the survey. Following the students' completion of the survey, the data was analyzed for key words and phrases, so as to gain insight on perceptions of service learning. Overall, there were 26 survey responses. Respondents came from all over the world, including, but not limited to, China, Germany, the Bahamas, and the United States, and the majority were female. Further, 85% of respondents said they have participated in a service-based activity. The results of the survey varied. Numerous students felt that both their home country and Elon community place an important value on service. However, many respondents felt that while Elon University provides ample opportunities for service, many Elon students may get involved in service with selfish motivations. These findings provide interesting insight into the lives of domestic and foreign students, while just scratching the surface of how service has impacted their lives and college experience.

Reflective Writing in Pre-service Teachers: Habits, Techniques, and Effectiveness

Emily T. Ford (Dr. Stephen Byrd) Department of Education and Wellness

Research suggests that reflection is crucial for education majors to establish a foundation of effective teaching practices (Sweeney, 1998; Black, 2002). Specifically, reflection can be used as a practical tool for educational planning (White, 2002; Pedro, 2006), professional development (Vacca, Vacca, & Bruneau, 1997), as a way to process ideas and beliefs (Hatton & Smith, 1995), and for preparing cultural critical consciousness in pre-service teachers (Gay & Kirkland, 2003). However, there is a lack of research regarding how pre-service teachers feel about and interact with reflective writing. This study explores how pre-service teachers in their Math/Science Methods placements interact with writing. To collect data, six participants were asked to complete a pre and post-research survey, participate in a focus group, and reflect on their school placements over a two-week period of time. The first week of writing was unprompted and participants were free to write whatever and however they chose. In contrast, while the participants could still engage in free-writing during the second week, they also had the option to use a list of prompts that was shared with them. Through the collection and qualitative analysis of the focus group, answers to two surveys, and their reflective writing, the study focused on how and what pre-service teachers write as part of their reflection, how they feel about the process, and what habits they have regarding their own writing. Currently, data analysis of the answers provided during the focus groups and surveys suggests that pre-service teachers

recognize the importance of reflective writing practices for their career, but lack the motivation to apply that knowledge and create a habit of reflective writing. The perception of reflective writing tends to hold more negative connotations in the minds of the pre-service teacher participants and, therefore, has influenced the extent to which they engage in the process. Results of this project will provide insight into how pre-service teachers feel about the effectiveness of reflective writing practices which can better aid professionals in the field of pre-service teacher education to encourage students to develop effective reflective writing practices.

Least Restrictive Environment Doesn't Look the Same: Three Case Studies in the Alamance Burlington School System

Sara R. Gostomski (Dr. Stephen Byrd) Department of Education and Wellness

IDEA requires that students with special needs be instructed in the least restrictive environment. This means students must be included with non-disabled peers as much as is possible so that students can achieve to their highest potential (Hallahan, Kauffman, & Pullen, 2009). This case study examined three different learning environments in which students with autism receive services. The purpose was to document the different patterns of behavior and academic learning that can affect a student's school performance as they learn in their least restrictive environment. Participants for this study were elementary aged students diagnosed with autism enrolled in a local elementary school. The first setting examined a self-contained classroom where students are taught in small groups according to their academic level. The next environment was a general education classroom in which students of differing abilities were taught by one classroom teacher. The last setting was a combination of these first two, where students were pulled out of their general education classroom and offered additional instruction for a small part of the day. Data was collected in several ways to explore the least restrictive environment. Through a checklist, students' behaviors were documented including fidgeting, movement, etc. Observational data was taken to note student engagement with their schoolwork and teacher in each setting. Various patterns were discovered specific to each of the three learning environments that point towards the benefits and areas of challenge for the least restrictive environments. Implications from these findings can give direction for the settings most conducive to learning for individual students with autism as well provide support for teachers working with these students.

Beyond Interconnected Sustainability Education: A Case Study NC Green Schools

Nathan W. Hunnicutt (Dr. Scott Morrison) Department of Education and Wellness

The green school movement began several decades ago “as an effort to promote environmental literacy” (Sterrett, Imig, & Moore, 2014, p. 2). In 2011, North Carolina developed the Green Schools of Excellence award, grading applicants based on five criteria: culture and community, school sustainability, healthy schools, curriculum integration, and innovation. There are few studies on green schools in the U.S. In this qualitative case study, I investigated whether and/or how three NC Green Schools of Excellence took an interconnected approach to sustainability education (Henderson & Tillbury, 2004). According to Warner and Elser (2015), interconnectedness refers to “the facilitation of the interactions, collaborations, and integrations

between diverse and relevant disciplines, ideas, and educational stakeholders in order to teach students that our actions may, and often do, result in unintended consequences” (p. 2). My primary research question was as follows: *In what ways are NC Green Schools of Excellence providing an interconnected approach to sustainability education?* In addition, I was interested in the following sub-question: *What do green schools offer, other than typical content and experiences, that can make the case for continued support?* To answer these questions, I surveyed over 50 teachers and administrators; interviewed over 30 teachers, administrators, and students; observed teachers and students in over 15 classrooms; and analyzed each school’s Green School of Excellence application. I found evidence that all three schools exemplified interconnected sustainability education. For example, each school had gardens and other outdoor learning environments, intentionally connected with community members outside of the school, and encouraged interdisciplinary projects and collaboration among the teachers. Perhaps more importantly, I noticed other factors -- not necessarily related to being green -- that contributed to their identity and culture: *philosophy*, reflecting the values and practices of progressive education; *ethos*, a multidimensional and multidirectional ethic of care; and *vision*, preparing students for the innovation era with a focus on 21st century skills (Wagner & Dintersmith, 2015). These three factors may lead to new questions about the roles that green schools might be able to play in transforming education more broadly.

Implications for Elementary Educators’ Abilities to Accurately Self-Evaluate Their Mathematics Teaching Practices in Relation to Math Anxiety Levels

Molly C. Kearns (Professor Erin Hone) Department of Education and Wellness

Elementary teachers’ math attitudes influence the math experiences they create for their students, fundamentally shaping students’ attitudes about math at an early age. Considering that approximately 87% of elementary school teachers in the United States are female (UNESCO, 2015) and that females experience higher levels of math anxiety than males (Hyde, J. S., Fennema, E., Ryan, M., Frost, L. A., and Hopp, C. , 1990; Else-Quest, N. M., Hyde, J. S., and Linn, M. C., 2010), it is necessary to analyze the relationship between how a teacher feels about mathematics and how she impacts her students’ mathematical experiences. While the literature already highlights the relationship between teachers’ math anxiety and students’ math attitudes and success, little is known about the relation between a teacher’s math anxiety and her cognizance of use of positive math teaching practices, also referred to as self-reflection abilities. This mixed-methods study explored elementary teachers’ abilities to self-evaluate their math teaching practices in relation to their levels of math anxiety, as well as other demographic factors using quantitative data analysis. Teachers (N= 202) from 40 states participated in a 3 part survey comprised of the Math Anxiety Rating Scale-Revised (MARS-R), questions about teaching practices aligned with the NCTM Effective Mathematics Teaching Practices, and beliefs also aligned with these practices. These findings were then compared to qualitative data examining the same teaching practices within three case studies (N=3) in Alamance-Burlington School System in North Carolina. Overall, across all math anxiety levels, teachers in this study were only somewhat accurate at self-evaluating 50% of the time, and only very accurate 15% of the time, and strengths and weaknesses for the eight individual NCTM practices differ based on anxiety level. We discuss implications for the ways educators reflect on their practices and

identify those math practices which are most difficult for teachers to execute and self-reflect on based on anxiety levels and other factors.

Math Anxiety: Is There a Correlation Between Awareness and Reduction?

Nicole M. Kister (Professor Erin Hone) Department of Education and Wellness

The literature on math anxiety indicates that young students' anxiety can form as early as elementary school (Perry, 2004). Math anxiety can develop in early childhood if parents themselves are math anxious (Beilock, 2017). Students who are math anxious do not typically score well in math. This continues into high school, inhibiting students from reaching their full potential within their math classes. The goal of this study was to see if awareness of math anxiety helps students to recognize their own anxiety, and in turn, identify strategies that will help to learn math with more ease. Research questions included the following: If students know about math anxiety, can they be helped? If students have information about why math anxiety exists, can they attend to strategies to alleviate some of that stress?

This research took place in a high school in the Alamance Burlington School System, in two classes with similar populations, studying the same level math content with the same teacher. Using the MARS-R survey, students were assessed on their level of math anxiety. After this baseline assessment, one class was given a presentation about the possible causes of math anxiety and strategies for combating their potential math anxiety. The teacher continued to use the same practices and pedagogy throughout the semester with both classes, but only emphasized and referred to strategies for reducing math anxiety to the class who were given the presentation. Initial surveys displayed a common range of math anxiety across both classes, with both classes averaging in the low-mid range.

At the end of the semester, students in both classes were administered the MARS-R again to see if there was any impact from this process. Initial findings indicate students who were not made aware of causes and strategies stayed within their original math anxiety range on the second survey, while students who were made aware stayed the same or dropped enough to move into a lower range of math anxiety. Results of this project will inform teachers, parents, and students about the knowledge and implications of math anxiety on student performance.

Do Gritty Teachers Create Grittier Students? Implications of Teachers' Dispositions within the Classroom Environment

Paige S. Knapke (Professor Erin Hone) Department of Education and Wellness

The purpose of this study is to determine whether a teacher with a strong growth mindset, who fosters a class culture of gritty dispositions, can impact a student's personal growth mindset, regardless of a student's experiences outside of school. Angela Duckworth (2016) describes the characteristic of grit as a combination of passion and perseverance that drives success and achievement. Research on students living in poverty suggests grit promotes inequities because of the lack of opportunities economically disadvantaged students are afforded to build such dispositions. While teachers cannot control students' experiences outside of their classroom, we

wonder if they can instead build a culture and atmosphere in their classrooms that promotes grit and a stronger growth mindset. Three teachers from the Alamance Burlington School System were selected for the study based on high results from the Patterns of Adaptive Learning Scales (PALS) survey distributed by Teaching Fellow, Micaela Malachowski. The students in these three classes were given a survey to evaluate their own dispositions and mindset at three points in the 2018-2019 school year. The present study builds on this work, administering an additional survey to the families of those students to gather information about the types of opportunities and experiences the students had outside of the traditional school setting. Questions inquired about students' opportunities prior to their formal school years (pre-school years), during their time in elementary school, and during school breaks. From this data, this study focuses on several students from four different groups in those classrooms: 1) formal learning experiences and opportunities, 2) mixture of formal and informal learning experiences, 3) informal learning experiences and opportunities, 4) lack of formal or informal learning experiences and opportunities. Final data will be compared with the three data points of the students' PALS surveys to determine how the students' mindset and dispositions are related to the experiences in their classrooms, with the additional knowledge of their formal and informal learning opportunities. This study can bring a general awareness to how teachers can better develop students within the school walls, regardless of their opportunities and experiences outside of school.

“My Hand Feels Relaxed”: How Children Use Fidget Spinners to Manage Activity and Attention in a Play-Based Environment

Rachel E. Kowalewski (Dr. Julie Justice) Department of Education and Wellness

The focus of my inquiry is examining how children use fidget spinners while they are learning and playing. Fidget spinners are hand-held devices that are designed to spin freely in hand. They became very popular with children around 2017 and both social and mainstream media covered the fad extensively. Despite a lack of scientific evidence, these sources presented them alternately as toys, distractions, toys that prevent distractions, while, benefitting children with ADHD, anxiety, autism, and sensory issues (Schechter, Shah, Fruitman, & Milanaik, 2017). Research has indicated that these tools can enable students to manage sensory issues, anxiety, and attention challenges by redirecting their physical energy into an object, allowing them to remain calm and participate productively (Biel, 2017). Fidget spinners allow for sensory input which can help calm the body or become more alert (Entwistle, 2017). However, a group of researchers found that while fidget spinners did help children reduce their activity level, it had a negative effect on their attentional functioning (Graziano, Garcia, & Landis, 2018). This study seeks to answer the following research question: What practices emerge when children are given fidget spinners in a low-stakes, play-based environment? This will allow us to see how children use these devices, deciphering the connection between how they reduce activity levels and whether they improve attention. The participants of this study were elementary age children at a play-based evening childcare program. Children were observed using an observational protocol over five hours spread out over three events. Some of the children were then interviewed to further understand their practices. The following findings emerged: 1) children used spinners primarily during transition periods, 2) they did not use them when their hands were engaged, 3) when they did use them, they frequently allowed the spinner to spin in their hands while on task;

4) some students engaged their whole body while spinning (i.e. moving their arms, standing up). The data indicates that participants used the fidget spinners to channel activity and energy with no distractions. The results of this study will contribute to the field by providing insight into children's experiences with fidget spinners.

How and Why Educators Use Instagram

Michalene Anne Lee (Dr. Jeffrey Carpenter) Department of Education and Wellness

This presentation will discuss a study of educators' professional use of Instagram. Instagram, a widely used social media platform, has received relatively little attention from education researchers, despite its use by many educators. Similar to other social media platforms, such as Pinterest, Instagram is a visual platform that may be particularly appealing to users that are educators. For example, the hashtag #teachersofinstagram has been included in over 4 million posts. Research on other social media platforms (e.g., Twitter) has suggested benefits for educators such as building professional learning networks (PLNs) and as a resource for finding, sharing, and curating curriculum materials; despite this, research on Instagram's uses has been limited in scope and depth. Therefore, the aim of this study is to address a gap in the literature by addressing the following question: *How and why do educators use Instagram?* To answer this question, we collected data from 841 respondents via an online survey disseminated through various social media platforms. A majority of our respondents identified themselves as white females who are early adopters of technology. In this sample, 71% of respondents reported using Instagram for professional uses more than once a day, suggesting intensive use of the platform. Additionally, 87% of respondents reported primarily using Instagram to look at ideas and content shared by other educators, indicating that Instagram's visual nature is attractive for educators. Participants also overwhelmingly reported including aspects of their personal lives in their professional use of Instagram. Preliminary analyses have shown the majority of participants pairing their professional use of Instagram with professional use of other social media platforms. Therefore, this presentation will also compare how educators are using Instagram professionally with their use of other social media platforms. Follow-up interviews are being conducted in the coming weeks with a purposeful sample of survey respondents and will expand upon trends discovered in the survey. Our research on Instagram's usefulness for educators and their purposes when using the platform will help build understanding of how social media sites not originally intended for collaboration by professionals can be adopted for professional use in the digital age.

Do Gritty Teachers Create Grittier Students? Impact of Teachers' Dispositions on Student Mindset

Micaela C. Malachowski (Professor Erin Hone) Department of Education and Wellness

The purpose of this research is to identify the impact a teacher's personal beliefs on growth mindset has on their students' attitudes about intelligence and gritty dispositions. Current research studies focus on the correlation between grit and growth mindset. In a recent study, grit and life satisfaction predicted teacher effectiveness at the end of a school year (Duckworth & Winkler, 2013). Further, Duckworth and Winkler suggest that "one promising direction for

future research entails directly measuring the impact of directing attention to specific, changeable aspects of performance on trait-level grit.” This leads me to believe that teachers with strong beliefs in growth mindset will create a conducive environment that encourages their students to develop this mindset. In order to investigate this, teachers in the Alamance Burlington elementary schools were surveyed using the PALS: Patterns of Adaptive Learning Scales (Midgley, C. et al., 2000) teacher survey, on their beliefs about growth mindset and the teachers who rated strongest in their beliefs about growth mindset were selected. The students of the selected teachers were surveyed in October, January, and will be again in April, of the 2018-2019 school year using the PALS: Patterns of Adaptive Learning Scales student survey. To account for the discrepancies in scores between questions that included “avoid” statements, groups of questions were separated before finding the total of the positive and negative groups. A spectrum of least ideal to most ideal was used to gauge students’ range of cognitive, affective, and behavioral components, and also to compare scores across surveys. Because the final survey will be administered in April, we will report preliminary findings at SURF. Although we cannot make justified generalizations with the small data set between survey one and two, initial comparisons show the majority of students in all classes do fall into the “most ideal” to “ideal” range. This indicates a possible correlation between the teacher’s practices to students’ mindset and beliefs about their own skills and abilities. Ultimately, these findings will add to the knowledge about teacher’s ability to build gritty dispositions in their students, and hopefully, in turn, improve their students’ academic growth.

Mentoring Novice Teachers to Improve Teacher Retention

Elizabeth P. McFarland (Dr. Joan Barnatt) Department of Education and Wellness

Teacher retention is an issue for attracting and retaining a highly qualified and effective work force in a field of critical social and public concern (Barnatt et al., 2017; Cochran-Smith et al., 2012; Darling-Hammond, 2010). The research also indicates that almost half of all teachers will leave the profession by the end of their fifth year of teaching (Ingersol, 2001). The cost of teacher turnover is significant in terms of financial investment in recruitment and support for teachers new to a school. Additionally, there are costs in repeatedly replacing novice teachers who are not fully ready to support student learning and outcomes. This turnover is more likely to occur in areas of most need - particularly schools that serve children of poverty. One means of ameliorating this costly attrition has been to implement mentoring programs for novice teachers (Orland-Barak, 2014). These programs, however, vary widely from state to state, and school to school. Since 2010, North Carolina has required all districts to provide mentoring to novice teachers in K-12 schools (North Carolina Department of Public Instruction, 2010). This study explores the mentoring tenure of a novice teacher in a local K-12 public school, asking: What is the experience of a novice teacher in receiving support for transitioning from teacher candidate to teacher-of-record in a diverse classroom population? An interpretative, qualitative case study of a novice teacher, their school-based mentor, district-based mentor, and the administrator overseeing the mentoring program, was conducted for exploratory purposes (Yin, 2017). Data was collected through face-to-face semi-structured interviews, which were audiotaped and transcribed. Results were analyzed using grounded theory (Charmaz & Belgrave, 2007). Findings to be presented include the advantages and challenges of the team approach in

mentoring; differences in attending to the needs of diverse populations; and a disconnect between resources provided and perceived.

Reading to Succeed: An Examination of the Interests and Engagement of Struggling Pre-Adolescent Readers

Kristen L. O'Neill (Professor Marna Winter) Department of Education and Wellness

Previous research studies examine the centrality of interest to the motivation of students; however, there is a lack of research regarding the influence of interesting reading materials on the motivation and engagement of struggling pre-adolescent readers who are 2-3 grade levels below their peers. Particularly, not only is there a lack of research regarding the efficacy of interesting materials on the engagement of struggling readers in classrooms, but also there is a scarcity of interesting reading materials that are written on their reading level and correspond to their interests and maturity. Struggling readers, defined as students eligible for intervention due to low tests scores and performance, often lack motivation due to learned helplessness and low self-efficacy, which results in difficulties in the classroom (Casey, 2008 and Paige, 2011). Most struggling readers would be willing to read more if given their preferred reading materials on their reading level; specifically, interesting reading materials were the main component behind students' reading motivation. However, despite this conclusion, there is often a discrepancy between what students prefer to read, what is age and reading ability appropriate, and the available materials in a classroom (Broadus & Ivey, 2002). This study investigates the impact of interest-centered leveled readers, or high-interest low-readability books, on the motivation, engagement, and interest in reading of struggling fourth and fifth grade readers. Specifically, can high-interest low-readability leveled readers increase student engagement in guided reading sessions and motivation to read for struggling readers? Through pre-surveys, the creation of leveled readers catered around student interest, implementation of interesting reading materials in guided reading sessions in a literacy intervention classroom, and post-surveys, the engagement and motivation of struggling fourth and fifth grade readers were analyzed. Results from this study suggest that students' engagement increased when given high-interest reading materials. The data from this study shows the necessity of interesting reading materials for this population of students to inform book publishers and pedagogical practices for reading intervention sessions.

English

A Genre against Them: Regulating Young Adults through Literature

Nicole Galante (Dr. Megan Isaac) Department of English

Young adult literature is touted as genre for and about adolescents. Scholars and readers overwhelmingly believe that the genre is one of empowerment, one that is truly *for* adolescents in every sense of the word. The genre does empower adolescents in some ways, like providing mirrors and windows into lives other than their own; however, a close examination of troublesome patterns in the genre reveals that in small yet crucial ways the genre is doing a very

poor job at serving the audience it claims to champion. Rather than empowering young adults, the authors in the genre are attempting regulate their power.

My research explores the ways in which this regulation of adolescent power affects the genre. In order to understand the extent of the genre's regulation of young adult power, I first recognized two common and problematic occurrences in the genre: future-oriented narration and young adult death. When telling stories about young adults, authors of the genre tend to write characters who constantly look to the future: they look to graduation, college, moving out, and falling in love. Additionally, authors of the genre commonly kill off adolescent characters who break rules set forth for them by adults. By looking forward while also cutting life short young adult literature is simultaneously promising future power and removing the possibility of it altogether. My research argues, therefore, that young adult literature is not serving to empower adolescents; rather, the genre is attempting to regulate the power of adolescents by threatening them to follow the rules set forth by adults. Until young adult literature changes the way it deals with topics like the future and death, the genre will not be for adolescents: but against them.

Understanding Character through a Hybrid Genre

Peter J. Connelly (Dr. Cassandra Kircher) Department of English

Characters, like the individuals they represent, are wildly unpredictable and nearly impossible to pin down. For my Elon College Fellows project, I chose to focus on this essential part of fiction. In researching what genre would function best for my research, I read several authors (including but not limited to Kevin Wilson, George Saunders, Merritt Tierce, Junot Diaz, Denis Johnson, and Jennifer Egan).

Based on the models I read, it became clear that I wanted to stay with a group of characters for an extended period of time; however, I knew that a novel would have too large of a scope in terms of both time and narrative structure. At the same time, I understood that a traditional collection of short stories would not allow me to explore the characters I wrote about as thoroughly as possible. As a result, I chose to write a collection of linked short stories. By choosing a hybrid form, I was able to focus on brief and highly impactful moments within characters' lives, while staying with the same group of individuals. This resulted in a deeper understanding of the characters themselves in a shorter and potentially more interesting timespan.

***With Grace Among Men*: The Construction of a Historical Novel**

Elizabeth A. Ainger (Dr. Kathy Lyday) Department of English

The genre of historical fiction serves as a literary middle ground between the fields of English and History. The writing of history is a narrative craft based on the scholar's particular interpretations and constructed presentation of the chosen topic. My research project seeks to determine how a historical fiction novel can be used as a method to portray those interpretations of history to a broader audience of people less likely to show interest in historical texts. After completing this study, I will write my own novel entitled *With Grace Among Men* as an example

of my findings. I focus specifically on the feminine experience of resistance workers during the Second World War. Through studies of newspapers, autobiographies, and oral history interviews, I have researched the ways in which British and French societies constructed feminine identity for the expressed purpose of defeating the Nazis. For example, the life of Nancy Wake Fiocca exemplifies how married women involved in active resistance struggled between societal and government expectations of their roles in the home and as wartime patriots. I apply those historical themes and interpretations to the medium of a novel. After studying contemporary examples of historical fiction, I have developed my own techniques for constructing a narrative using the three characteristics of the genre: a character with whom readers can empathize, an engaging plot, and an immersive setting. Using these developed methods, I am writing my own novel as an example of how creative methodology can interest a wider audience in the stories of women from World War II.

Grammar Guides across the Disciplines

Ashley J. Andrews (Dr. Jessie Moore) Department of English

Having good grammar is an essential skill for any college graduate looking to obtain a decent job. As a Professional Writing and Rhetoric student, I know how important grammar is in forming language, and if used properly, how it can benefit the writer in a rhetorical situation, or a situation where an audience has the potential to be persuaded. It doesn't matter if the student is majoring in biology or English, because eventually, both fields will require the student to perform some form of written analysis. Thus, having good grammar, and being able to use it well, is necessary to be taken seriously in the professional world. This research explores how students' knowledge of grammar differs across the disciplines, and the kinds of grammatical information these students in different majors feel will be beneficial to them, and their future careers, in a basic grammar guide. My research process consisted of surveying students across disciplines regarding their exposure to grammar and the grammatical information they would like to learn more about. This allowed me to examine the students' skills and better analyze their needs and wants concerning the guide. In addition to that, I interviewed a member of the Student Professional Development Center (SPDC) to gain insight from a person who works with a variety of students when writing essential documents, where grammar is crucial, such as cover letters and resumes. I used the most popular information from both the surveys and the interview to create a website serving as a guide for basic grammar across several disciplines.

Thinking Like a Feminist: Persona Poems of Linda Lovelace, Simone de Beauvoir, and More

Natalia L. Conte (Dr. Janet Warman) Department of English

Over the last three years, I have been engaged in undergraduate research through the College Fellows Program at Elon University. My intention was to cement the rich and sometimes forgotten histories of influential women who partook in the feminist movement through persona poetry. My collection showcases about 20 persona poems written about Simone de Beauvoir, Linda Lovelace, and Mary Wollstonecraft, as well as several other poems written about my grandmothers and my own mother. I hope that by connecting feminism and strong female role

models to my own life, I gain credibility and understanding within the eyes of the reader. The work is situated nicely within the realm of creative scholarly work tied to the English discipline as I have performed extensive research with the intention to make my collection feel more accurate, informational, and alive. My research methodology was twofold: first I began by reading successful persona poems such as the works of Natasha Trethewey, Jessica Jacobs, Morgan Parker, and Paisley Rekdal. Each collection gave me further insight into what makes a successful persona poem and how I should navigate my own personal research. I then engaged with several biographical texts concerning each of the women I was researching: from Linda Lovelace's tell-all memoir "Ordeal" to Simone de Beauvoir's collection of letters published posthumously titled "Letters to Sartre." Each provided more insight into the women and their lived experiences. The conclusion of my project is a fully revised manuscript which exhibits the most refined works I can provide.

"I Turn My Face in Silence to the Wall": The Intra-textuality of Christina Rossetti's *Goblin Market and Other Poems*

Mary E. Emmerling (Dr. Rosemary Haskell) Department of English

Throughout *Goblin Market and Other Poems*, Christina Rossetti develops themes of love, loss, and regrowth in her individual poems. However, her poems also echo and respond to one another, repeating similar levels of theme and structure, so when read together, the poems' interactions reveal her subversive commentary. My research investigates these intra-textual spaces to understand how the arrangement of Rossetti's poems further expresses her writing style. Dolores Rosenblum (1986) discusses this intra-textual writing style as a particularly feminine trait, calling it "the poetry of endurance" and arguing that because the woman struggles with oppression in society, her writing must reflect that endurance she employs to combat this oppression. Rosenblum writes that Rossetti's individual poems do not continuously invent new perspectives, but rather repeat the same images and motifs across multiple poems, effectively exemplifying her poetic endurance (Rosenblum, 1986). Rossetti's use of this intra-textual technique reveals the precariousness of her own position: she was too outspoken to stay within the poetic bounds of traditional Victorian structure, but she continued to be limited by her prominent social position. As a result, Rossetti writes surreptitiously, exhibiting a palatable feminine facade, but simultaneously creating an elusive female subject. Rossetti's usage of this technique invites scholars to read her poems intra-textually, and in my study of *Goblin Market and Other Poems*, I track common themes and images through each individual poem to analyze the emerging contradictions. For example, Rossetti commonly portrays twilight as a dangerous time, but in "Twilight Calm", the speaker seems to represent twilight positively. Reading Rossetti's poems together highlights this contradiction and reveals a typically inconspicuous, subversive commentary. When *Goblin Market and Other Poems* is read as a cohesive piece of literature, therefore, the poetic arrangement emphasizes how Rossetti embeds the deeper significances of her poems not only within the poems themselves, but also among the spaces between them.

Putting Journaling in your Teacher Toolbox

Juliette Theresa Firla (Professor Paula Patch) Department of English

Elon Teaching Fellows must develop and present on a significant research question that is connected to our discipline and our passions. This Elon IRB-approved project looks at teachers' general beliefs surrounding journaling and whether it is helpful to incorporate journaling into the classroom, not only for academic success but for the students' mental health and a less stressful classroom environment. High school teachers from the Alamance Burlington School System and English faculty from Elon University were asked to complete a 15-question survey about the benefits and challenges of journaling in the classroom and to upload journaling prompts or assignments, if they chose to. They were also asked questions about why they assign journals (or not), how they assign journals, where they learned about assigning journals, and whether they personally journal. Research shows a strong connection between journaling and positive emotional and mental health, in addition to any academic benefits of journaling (Miller, 2014; Bishop, 1993; Stevens and Cooper, 2009).

Thirty teachers responded to the survey: 11 university faculty and 21 high school teachers. All respondents teach English and Language Arts classes. Twenty-one respondents use journaling in their classroom, while nine said that they do not. Journaling is used fairly equally across all grades, including at the university level. Many teachers shared that they experienced journaling as a student, during undergraduate and graduate coursework. Professional development workshops were also a top answer for the acquisition of knowledge surrounding journaling. More teachers do not keep a personal journal, than do. I received classroom journaling prompts from ten different respondents. Preliminary results indicate that the majority of English and Language Arts teachers use journaling in their classrooms for a variety of reasons. Respondents who use journals in the classroom primarily use it to teach students to be better writers and thinkers. Many teachers said journaling allows for students to write risk-free in a reflective way, connecting to the emotional benefit that research indicates comes from journaling. This research will provide answers to the many unanswered questions teachers have about the correct approach for classroom journaling.

Breaking Down Barriers: A Rhetorical Analysis of College Materials Aimed at First-Generation College Students

Nicole L. Galante (Dr. Jessie Moore) Department of English

This project seeks to understand how eight colleges and universities in the Triad area of North Carolina market to and speak about first-generation college students. Systematic barriers have been in place for decades that marginalize first generation colleges students in the college search process. These include financial barriers like application and standardized test fees. A more nuanced barrier that plays just as big a role in the marginalization of these students is language--specifically, how colleges talk about them and how they are talked to by colleges. In order to determine the ways in which first generation students at these institutions are talked to and about, I performed a close rhetorical analysis of official college documents. These documents include web resources, admissions materials, and materials from targeted events like specialized orientations held just for first generation students. In order to put these documents into context, I performed a comparative analysis of documents created by these same colleges and universities for a general audience, including non-first-generation students. Rhetorical strategies of interest include tone, purpose, and audience appeals. My findings inform a report for senior admission

officials at Elon. Findings have the potential to reveal patterns and/or disparities in the ways these colleges market to and talk about first generation college students, thereby informing university officials of equitable strategies they can use to accommodate for the needs of first-generation students without causing further marginalization.

Looking Beyond the Classroom: Responding to Educator Needs in Linguistically Diverse Schools, A Leadership Prize Project

Courtney N. Kobos (Dr. Jennifer Eidum) Department of English

This Leadership Prize project seeks to understand--and respond to--the everyday challenges of teaching linguistically and culturally diverse students. The Pew Research Center states that by 2020, one in four of American students will be an immigrant or a second language learner (Baltzer, 2015). It is vital that school systems adjust to meet the needs of this new school population and prepare all students to live in a complex world. In North Carolina, there has been a rapid diversification of school populations. The Center for Public Education (2012) reports that between 2000 and 2010, North Carolina minority populations grew more quickly than the total population. The increased cultural and linguistic diversity of school populations requires new approaches to education, both nationally and locally. However, a lack of teacher training, assessment-focused policies, and limited resources have prevented schools from adapting to this despite their increased diversity. This project was conducted in three stages: first, I conducted interviews and utilized an institutional ethnography methodology (Smith, 2005) to conduct interviews with teachers. Second, I identified school resources that support ELL learning. Third, I co-organized the first Elon English Language Teaching Symposium which brought together Alamance Burlington k-12 teachers, administrators, Alamance Community College staff, Elon students, Elon faculty, and two expert keynote speakers to create a community of practice, a group that is dedicated to growing and learning together, which explores the pedagogical challenges they face and enacts local solutions. This SURF presentation will focus on the outcome of my project, a one-day English Language Teaching Symposium held at Elon University that brought together a community dedicated and empowered to serve ELL students. At the Symposium, local educators shared their work and discussed practical solutions to teaching linguistically and culturally diverse students. The collaboration between local educators, Elon students, and Elon faculty will continue as community members continue the conversation on Twitter, over email, and through future conferences. This presentation will also discuss the future of the Elon English Teaching Symposium and the leadership skills that I gained through conducting undergraduate Leadership Prize research.

Integrating Cross-Cultural Students across First-Year Writing

Diana X. Pinel Urrutia (Dr. Jennifer Eidum) Department of English

This research aims to understand collegiate student academic experiences in cross-cultural first-year writing. Studies show that being exposed to cross-cultural writing experiences not only benefit international students in their writing, but also benefit domestic students in facilitating their multicultural knowledge (Barnett, et al., 2017; Larsen-Freeman, 2013; Matsuda & Silva, 1999). Knowing different languages is a positive asset for college students (Hafernik and Wiant,

2012) as well as encouraging multicultural understanding and competence (Barnett, et al., 2017). Acknowledging this foundational research, the study was then set in place to create three cross-cultural first-year writing courses at Elon. This study examines the experiences of students in those classes in Fall 2018.

After a successful pilot study in the semester of Fall 2017, in Fall 2018 groups of diverse students were placed in “multilingual student pods” in English 110, a required first-year writing course for university undergraduates. The goal of this course is to help students from different racial and ethnic backgrounds flourish in their academic lives at Elon as well as increase domestic students’ global awareness. The purpose of this study is to find out whether the course achieves its intended goals and is successful in increasing students’ cross-cultural awareness and building cross-cultural relationships.

I conducted short focus group conversations in three cross-cultural first-year writing courses at the end of the Fall 2018 semester to understand the students’ experiences. The data was gathered through a series of open-ended questions. Findings for this project include students feeling that the course provided a welcome social and academic atmosphere created by professors that really cared about them as individuals. The challenges that students faced were those they had to adapt to, such as time management, or things that students had no control over, like the organization of the course itself. Interviews with the professors from this pilot study will also be completed to be analyzed as well. The interviews will examine how the courses were adapted to meet cross-cultural student needs.

A Balanced Life: Applying Rhetorical Strategy to the Creation of Branding Materials

Sabrina F. Tuton-Filson (Dr. Jessie Moore) Department of English

This project researches and puts into practice the most effective rhetorical methods in order to create successful marketing materials and branding for my future business endeavor — a lifestyle organization / consulting business. As an aspiring Art Director, whose primary role would be to create a cohesive vision using visual design that aligns with the company’s interests and brand identity, this project has not only helped me exercise my knowledge of rhetorical strategy to develop the brand of my company but has also given me real life experience that is relevant to my projected career path. I focus on researching branding and visual design concepts crucial to creating a successful business and test the effectiveness of my designs using focus groups. This research is informed by current scholarship regarding the connection between rhetorical strategy and physical spaces. It reveals that we can indeed create a sense of calm — even an emotional or psychological release — in our lives through careful attention to the organization and arrangement of our physical spaces. Since the core of the business is a service that intends to foster a sense of calm in my client’s lives, exploring this relationship not only allows me to interact with spaces in a more purposeful way but also explain why it works. In effect, this project extends applications of professional writing and rhetoric studies to marketing and branding, both of which are more commonly associated with communications and advertising studies. It also reveals how rhetoric is an ever-present phenomena in our world; we are fully capable of crafting our lives in the same way we do a speech or piece of written work and we should take advantage of that. These two categories of research have impacted the

decisions I made in my branding portfolio, which consists of branding materials for the business, including a business name, logo, tagline, color scheme, and contextual narratives discussing the brand identity.

The Truth of the Marriage Plot: Linguistic Double-Voiced Discourse in Four Brontë Novels

Meara Waxman (Dr. Janet Myers) Department of English

Shirley and *Jane Eyre* by Charlotte Brontë, *The Tenant of Wildfell Hall* by Anne Brontë, and *Wuthering Heights* by Emily Brontë all conclude with the fulfillment of the marriage plot, thus aligning with the conventions of closure for the Victorian novel. Using sentence-level linguistic analysis to identify passive voice, possessive language, and descriptions of animal imagery, my research illustrates ways in which all three authors create a dissonance between their language strategies and the content (plot, characterization, etc.) of their ending proposal scenes. More specifically, the Brontës espouse subversive content when they describe these unions because the female protagonists hold an unusual amount of power by Victorian standards while the men are financially, physically, or mentally weaker. However, each Brontë sister employs linguistic strategies that diminish the female character's authority and place that character within the bounds of Victorian propriety. Thus, the texts exhibit double-voiced discourse between the content and the language. First defined by Mikhail Bakhtin, double-voiced discourse refers to any discrepancies that exist within the text. For the purposes of this research, however, the double-voicedness specifically references the contradictions between the novel's content and the language that the authors use to convey that content. It is particularly important that the authors adopt this tactic at the end of their novels, as the conclusion of a book is the element that readers remember most vividly after they finish reading the text. Therefore, the authors use these strategies of double-voiced discourse to ensure that the Brontë sisters continue, in the closing pages of the traditional marriage plot, to encode their otherwise subversive content within a guise of societal respectability.

Students' Evolving Theories of Writing

Rachel B. Wingrat (Dr. Heather Lindenman) Department of English

At Elon University, English 110 (ENG 110) is many students' first exposure to college-level writing. One of its central goals is to prepare students to "apply rhetorical strategies to write effectively... for a variety of audiences, and... write critically about significant issues in multiple contexts." In a liberal arts education, students are required to take classes across a wide range of disciplines; however, all writing disciplines that students might encounter cannot be introduced in a one-semester course like ENG 110. Yet, according to Yancey, Taczak, and Robertson (2014), the curriculum of a first-year writing course can have a significant impact on students' ability to write in a range of disciplines. To examine the relevance of this claim at Elon, this research seeks to understand how students who took Dr. Heather Lindenman's ENG 110 class approach writing in genres that they perceive as significantly different from writing they did in ENG 110. The final assignment in Dr. Lindenman's ENG 110 class was to write a "Theory of Writing," where students detailed their beliefs about writing. A "Theory of Writing," along with

other reflective writing exercises, may serve as a “passport to help [students] cross new writing boundaries” (Yancey et al. 2014, p. 76). Two semesters and many writing experiences after their ENG 110 class, a group of 12 students with varying majors were interviewed about how their “Theory of Writing” had evolved since ENG 110. They were asked to reference writing assignments, both academic and non-academic, and explain how they did or did not apply their “Theory of Writing.” Initial patterns show that some students saw the influence of their “Theory of Writing” when approaching writing assignments that were fundamentally different than those composed in ENG 110 – such as math proofs, script writing, and lab reports – while others felt it fell short. Stage two of this research will investigate students’ reflections on their theories of writing. We code for specific factors, such as confidence levels in writing and whether a student had a growth or fixed mindset, that may have influenced their ability to approach new types of assignments.

Exercise Science

The Effects of Simultaneous Auditory Stimuli on Cognitive Function

Russell L. Adams (Dr. Eric Hall) Department of Exercise Science

Previous research looking into the effects of auditory stimuli on cognition has been met with mixed reviews with some studies concluding that music and auditory stimuli benefit the user while other studies found no significant effect (Hetland, 2000; Vernon 2009). While existing literature primarily focuses on the effects of a single auditory stimulus (e.g. Rauscher only comparing the effects of classical music on spatial reasoning), there is little research looking into the effects of more than one auditory stimulus being presented (Rauscher et al., 1993; Schellenberg, Nakata, Hunter & Tamoto, 2007). This study aimed to compare changes in cognition between groups which received different types of auditory stimuli. Participants (n = 80; 36 female and 44 male) ages 18–23 were randomly assigned into four groups of 20 (control, music only, binaural beats only, both music and beats). Each participant was given a pair of noise canceling head phones and completed four tasks; a paper-folding spatial reasoning task (Rauscher, 1993), a spatial memory task (Wepman, 1975), Stroop Perception test (Stroop, 1935), and CPT continuous attention task (Rosvold, 1955). Each group listened to a different auditory stimulus and the data was then analyzed to find significance between groups. It was hypothesized that the type of auditory stimuli would have an impact on cognitive function. After running an initial ANOVA on four dependent variables (folding score, folding time, spatial score and Stroop score), significance was found at the that the binaural beats group ($p=.043$) performed better at the paper folding task than the control and music only groups. Findings from this study would suggest that only certain areas of cognitive function benefit from listening to binaural beats. The finding the limits of binaural beats’ impact on cognitive function could potentially be the focus of a future study.

The Relationship Between Team Climate Factors, Sport Type, and Concussion Reporting Intentions in Collegiate Student-Athletes

Katherine E. Arbogast (Dr. Caroline Ketcham & Dr. Eric Hall) Department of Exercise Science

Concussions are mild traumatic brain injuries that can present with physical, cognitive and emotional symptoms. Research suggests that as many as 50% of concussions go undiagnosed as current practice relies heavily on symptom reporting by the injured athlete (Baugh et al., 2014). The primary objective of this study was to assess the influence of sports culture on pressures to report concussive symptoms in collegiate student-athletes. Online surveys distributed through student-athlete leaders were completed by 44 NCAA Division I, II, and III collegiate athletes (32 female; 12 male). Participants represented multiple sports that were categorized as contact and non-contact. Survey questions addressed team cohesion (MSCI, Yukelson et al., 1984), motivational climate (PMCSQ-2, Selfriz et al., 1992) coach climate (EDMCQ, Duda, 2018), situational intent to report (Kroshus et al., 2014), and questions around reporting behaviors. Qualitative questions were analyzed into predominant themes. Results include differences between contact and non-contact athletes in reporting intentions based on the situation, but no differences were found for gender. Non-contact athletes are more likely to report in a championship game ($p=0.02$), while there were no differences for a preseason practice ($p=2.45$) and regular season practice ($p=1.00$) yet a trend for a regular season game ($p=0.08$). Also of interest was the relationship between coach climate (EDMCQ) and motivational climate (PMCSQ-2) ($r=0.584$, $p<0.001$) indicating that an empowering coaching climate fostered a positive motivational climate among student-athletes. For all student-athletes themes related to the rationale of why they would not report concussion symptoms included wanting to stay in the competition, not wanting to have to go through the rehabilitation process, fear of losing a starting position and/or not wanting to let the team down. Implications of this study indicate the importance of addressing the driving force of withholding concussion symptoms and suggest that there are many team and individual factors as well as complexity that contribute to these behaviors. An increased understanding of non-disclosure of concussion reporting behaviors will help in the return to play progression by sports medicine staff as well as the well-being of student-athletes and their perception of team climate.

Coaching Behaviors and Athletes Ability to Achieve Flow

Melissa K. Birdsell & Giulianna C. Castronova (Dr. Eric Hall) Department of Exercise Science

In the past, research has been conducted investigating how and why athletes are able to achieve flow. Flow is a state of mind in which a person is able to perform at an optimal rate due to having a clear positive mindset. (Russell, 2001; Peterson & Greenleaf, 2014). In contrast, previous research has also examined how coaching behavior impacts an athlete's performance (Boardley, 2018; Kavussanu, Boardley, Jutkiewicz, Vincent & Ring: 2008). Although, no previous known research has examined the relationship between coaching behavior and flow. Coaching staff are a key facilitator of athletes' performance levels and therefore may help foster an environment either beneficial or detrimental to an athlete's ability to achieve flow. This research aims to find a better understanding of how coaching behavior affects an athlete's performance, specifically their ability to achieve flow. Questionnaires will be given out to participants during a scheduled session that will be held after practice. It is expected to have over 100 participants who are both male and female varsity athletes at a division one university. Questions relating to: 1) flow in the athlete's specific sport, 2) an overall assessment of the coaching behaviors perceived by athletes, 3) compatibility of the perceived relationship between

the athlete and the coach, as well as, 4) a sports confidence measure. Results are expected to align with the hypothesis predicted which states: positive coaching behaviors will correlate with athlete's ability to better obtain flow state during their sport, in contrast we also expect negative coaching behaviors will correlate with athlete lack of the flow state. By understanding the effects that coaching behaviors have on flow state, sports psychologist and other sports researchers can use this information to better educate coaches and enhance certain training techniques.

Building a Case for Affect Regulated High-Intensity Interval Training: It's a HIIT!

Daniel J. Cavarretta & Lauren E. Mihalek (Dr. Eric Hall) Department of Exercise Science

High-intensity interval training (HIIT) has grown in popularity as a time effective strategy to exercise. HIIT entails alternating between periods of high- and low-intensity exercise. Although most research has found beneficial psychological responses to HIIT, some research has found harmful effects which may impede a person's ability to maintain the exercise regimen. A potential way to increase rates of adherence to HIIT may be to allow exercisers to use the Feeling Scale, a measurement of affect, to self-select the exercise intensities. This experiment was designed to compare the effects of prescribed HIIT versus affect regulated HIIT on affect, enjoyment, rating of perceived exertion (RPE), power, and heart rate. Eleven participants (9 female: 23.8±9.5yrs; 65.8±18.4kg; 165.7±6.0cm; 2 male: 24.5±5.0; 108.5±12.7kg; 178.4±4.5cm) completed a total of three sessions. The first visit was a graded exercise test on a recumbent bicycle to determine peak aerobic power. The following two sessions were a 20 minute prescribed HIIT and a 20 minute affect regulated HIIT workout, completed in a counterbalanced fashion. All sessions were separated by at least 24 hours of rest. During exercise, affect, RPE, heart rate, and power were assessed. Affect was measured up to 5 minutes post using the Feeling Scale and enjoyment was assessed at 10 minutes post using the Physical Activity Enjoyment Scale. Statistical analysis revealed affect to be more positive both during ($p < 0.001$) and after ($p = 0.003$) exercise for the affect regulated HIIT condition. Enjoyment was similar between both conditions ($p = 0.354$) and RPE was higher during the prescribed HIIT condition ($p = 0.017$). For physiological responses, differences in heart rate and power were similar between both conditions (p 's > 0.05). Based on the observation that affect was more positive during and after exercise and that the physiological responses were similar between both conditions, individuals should be encouraged to use the Feeling Scale to regulate the different intensities during a HIIT workout. This conclusion is made based off previous research which has shown affect to be related to future physical activity behavior.

Implicit Bias and Bias Training in Healthcare Providers

Emily P. Keller (Dr. Caroline Ketcham) Department of Exercise Science

Implicit biases involve unconscious assumptions towards a person due to a variety of differences and outward perceptions which have the possibility to shape behavior (Greenwald & Krieger, 2006). Healthcare providers today, although they strive for equal treatment of all patients, exhibit biases towards patients based on gender, race, ethnicity, and many other characteristics (Fitzgerald & Hurst, 2017). These biases can lead to health disparities and differences in medical treatment during clinical decision making. The purpose of this study was to determine physician

assistants' knowledge of bias, including some bias measurements, as well as the amount of bias training physician assistants receive in their hospital systems. Surveys were distributed through an email to physician assistants (n=38; 29.2 years old; 2.4 years experience) from across the United States. Questions included demographic information, specialty, years in healthcare, and place of work. Additionally, included were bias measurement questions of social dominance, sexism, and ageism along with perceptions of bias, and training experience. Preliminary results showed that only 34% of physician assistants surveyed received bias training in their hospital system which was comprised of short lectures, training programs, and workshops, and the majority of respondents were interested in additional bias training. Further analysis of ageism, sexism, and social dominance results will be discussed based on demographic characteristics of participants. These results help identify the need for an increase in implicit bias training in hospital systems as well as at the educational level in physician assistant programs. Healthcare systems need to equip their providers with greater knowledge and awareness of biases so that they can aim to provide equal and exemplary care to all patients, focusing efforts on alleviating disparities seen within the healthcare system today.

Parent Perspectives of Health Care Barriers and Social Supports for Their Children with Disabilities within a University Community Context

Hope B. Koene (Dr. Caroline Ketcham) Department of Exercise Science

Background: Parents of children with disabilities experience greater amounts of stress, social isolation, and adverse physical and mental health risks as compared to parents of children without a disability (Halstead et al., 2017). To conceptualize the impact of disability on families, previous research has applied Bronfenbrenner's ecological model to understand the systemic and environmental factors that affect parental well-being (Resch et al., 2010). This study aims to identify how parental perceptions of social support structures within their community affect the experiences of families with children with disabilities. *Method:* Participants (n=15) are parents that have a child with a developmental or intellectual disability, neurological disorder, or chronic medical condition. Participants were recruited from the Elon University community through convenience sampling (flyers, email listservs) and eight participants are university employees. Children, 5 females and 10 males, ranged between three and 23 years old. Semi-structured interviews were recorded and transcribed for qualitative coding analysis. To identify themes, broad categories were established from a subset of interviews, then refined through situating trends within the literature. Identified themes were related to barriers to care, types of social support parents received, and perceptions of belonging within the university community (a component of each participant's ecological environment). *Results:* Participants discussed diverse barriers on multiple levels of the ecological model, such as medical need concerns, sense of stress, and access to care. Most participants (87%) identified social isolation or lack of social networks as a challenge related to care for their child. The two most common types of social support were instrumental and informational support, supplied mostly by medical providers and other parents. There were mixed opinions on online social media groups and the university community was identified as indirectly supportive to parental experiences. *Conclusion:* Parents offered diverse perspectives on their disability experiences. Although social isolation affected many participants, reported social support was largely focused on information seeking and tangible aid for disability treatment, rather than emotional support. This may have greater

implications for parental mental health and emotional well-being. Mixed feelings on inclusive practices within the community demonstrate a need for further investigation of potential community-based interventions.

Implications of the Cross Education Phenomenon on Rehabilitation and Training

Jonathan A Martinez (Dr. Matthew Wittstein & Dr. Stephen Bailey) Department of Exercise Science & Department of Physical Therapy Education

INTRODUCTION: Imagine being a sprinter who has injured their right leg and has been instructed to not bear weight on it. During several weeks of recovery, muscle strength and function in the compromised leg declines. Despite this setback, there may be ways to minimize atrophy and speed up recovery through cross education, the phenomenon that facilitates strengthening and mobility in a non-active limb by training the opposing limb. The purpose of this study was to observe how cross education occurs in the body through changes in brain activity. **METHODS:** Ten non-physically active college-aged students were randomly placed into either a control (n=3), physical training (n=4), or mental training group (n=3) for a 4-week training intervention. The control group received no intervention. The physical group trained by performing dumbbell bicep curls with a weight approximately 10% of their body mass on their dominant side three times a week. The mental group trained by performing mental imagery bicep contractions without movement on their dominant side three times a week. An electroencephalography (EEG) pre-and post-test during unilateral isometric physical and mental bicep contractions for the dominant and non-dominant sides were administered to assess changes in brain activity for the left and right frontal region of the brain. **RESULTS:** Wave amplitude analysis of brain activity for post-test is in progress. For the pre-test, the amplitude of the nondominant contraction (27.1 ± 11.5 mV and 32.3 ± 15.0 mV) displayed a significant difference from both mental contractions and the dominant contraction. **DISCUSSION:** The results suggest that more brain activity is required to execute non-dominant movements compared to dominant movements or mental contractions. This may be due to less developed neuromotor pathways on the nondominant limb. These findings may be used to create personalized treatments depending on which side an individual is injured. Future research is needed to optimize the role of physical and mental training.

Using Concussion Symptoms as a Proxy for Mental Health: Baseline Concussion Symptoms May Be Predictive of Depressive Symptoms

Christopher R. Riegner (Dr. Eric Hall & Dr. Caroline Ketcham) Department of Exercise Science

Depression is prevalent in college students and mental health is an overall concern. Student-athletes have shown lower rates of depression, but do report higher depressive symptoms following an injury. Current concussion management protocols call for baseline neurocognitive assessments of student-athletes, but not for psychological screening. This study aims to determine whether a common baseline neurocognitive assessment can be used as a proxy psychological screening for depressive symptoms in student-athletes. 516 collegiate student-athletes completed both the Immediate Postconcussion Assessment and Cognitive Test

(ImPACT) and the Beck Depression Inventory-II (BDI-II; Beck, 1996) as part of the university's baseline concussion management protocol. ImPACT is a computerized neurocognitive assessment which includes demographic information and a symptom survey. Each participant also completed the BDI-II, a common depression diagnostic assessment. Three models were tested to determine whether concussion symptoms could predict depressive symptoms. For Model 1, a linear regression was performed between total concussion symptom score (TSS) and total BDI-II score. In the first step (step 1), gender, treatment for psychiatric condition and migraines, and Attention Deficit/Hyperactivity Disorder (ADHD) diagnosis were entered and accounted for 13.1% of the variance. In step 2, TSS was entered and accounted for an additional 18.9% of the variance with the whole model accounting for 32.0% of the variance. For Model 2, a stepwise linear regression was run between all concussion symptoms and total BDI-II score after inclusion of step 1. Six concussion symptoms were included: nervousness (R^2 change=0.175), sadness (R^2 change=0.035), trouble falling asleep (R^2 change=0.022), vomiting (R^2 change = 0.013), fatigue (R^2 change=0.010), and visual problems (R^2 change=0.007). Total R^2 of this model was 0.393. For Model 3, another stepwise linear regression was then done including concussion symptoms shown to have a correlation of 0.3 or higher with total BDI-II score after inclusion of step 1. Five concussion symptoms were included: nervousness (R^2 change=0.175), sadness (R^2 change=0.035), trouble falling asleep (R^2 change=0.022), difficulty concentrating (R^2 change=0.010), and fatigue (R^2 change=0.007). Total R^2 for this model was 0.380. These models suggest that a subset of concussion symptoms from baseline testing can serve as a screening tool for student-athletes at risk for depressive symptoms.

The Relationship Between Academic Performance, Academic Confidence, and Concussion History in Collegiate Student Athletes

Morgan T. Schmidt (Dr. Caroline Ketcham & Dr. Eric Hall) Department of Exercise Science

The aim of this study was to examine how academic performance may be influenced by a history of concussion and academic confidence. Neurocognitive performance measurements were collected on 626 Elon University collegiate student athletes (50.8% female 19 ± 1.26 years) using the Immediate Post Concussion Assessment and Cognitive Testing (ImPACT™) concussion management software (ImPACT™ Applications, Inc.; Pittsburgh, PA). Academic performance was assessed using participants' grade point average (GPA) and the Academic Behavioral Confidence Scale (ABC) was used to evaluate academic confidence (AC). Findings indicated that there was a moderate positive correlation between GPA and verbal memory ($r = 0.11$; $p = 0.006$) and visual motor ($r = 0.11$; $p = 0.007$). A weak positive correlation trend was also shown between AC and impulse control ($r = 0.07$; $p = 0.064$). In terms of self-reported quality of student (QOS), there was a moderate positive relationship observed between this variable and both GPA and AC ($r = 0.21$; $p < 0.001$). Therefore, verbal memory and visual motor were both useful in predicting GPA ($r = 0.13$; $p = 0.067$ and $p = 0.081$, respectively). Further, visual motor, reaction time, and impulse control were effective in predicting AC ($r = 0.12$; $p = 0.023$, $p = 0.063$, and $p = 0.037$, respectively). Results suggest that there is a correlation between GPA, AC and neurocognitive performance variables in collegiate student athletes. Specifically, it appears as if verbal memory, visual motor, impulse control, and reaction time are positively associated with GPA and AC. However, past research has indicated that student athletes experience greater difficulty with neurocognitive performance following concussion(s)

(Alexander, Shuttleworth-Edwards, Kidd, & Malcolm, 2015; Moser, Schatz, & Jordan, 2005). Therefore, future research should investigate the underlying mechanisms by which concussions effect neurocognitive performance in hopes of preventing a decline in collegiate student athletes' GPA, AC and long-term neurocognitive performance.

Examination of Living Learning Programs in NCAA Division I Athletics Institutions: How Can Access Be Increased for Student-Athletes

Brendan M. Thiry (Dr. Eric Hall) Department of Exercise Science

Living Learning Programs (LLPs) are created around a variety of themes with the intention to integrate academics into the residential setting to help students develop a sense of community through learning (Brower & Inkelas, 2010; Inkelas, Jessup-Anger, Benjamin, & Wawrzynski, 2018; Shapiro & Levine 1999; Smith, MacGregor, Matthews, & Gabelnick, 2004). One population that may often be overlooked in engaging in LLPs is student-athletes (SAs). This could be due to time demands, irregular times that they report to campus or due to not being aware or understanding these opportunities. Recently, Mamerow and Navarro (2014) suggest that including SAs in LLPs may be a good way to assist in their transition to college and build community. Interestingly, across institutions some of the most popular majors for SAs included exercise science/kinesiology and sports management, which could inherently provide an integration of academic content with athletic participation. Data has been collected on 279 out of 351 NCAA Division I institutions. The research has identified the NCAA Division I institutions that offer LLPs around topics such as wellness, athletics and related topics (e.g., leadership) which might be of particular interest to SAs as well as student-athlete specific LLPs. Preliminary findings have indicated that only two universities, Ohio and East Carolina, offer a student-athlete specific LLP. Further analysis will be done to calculate statistics on how many institutions offer LLPs relating to topics about wellness, athletics and leadership. Additionally, the characteristics of the student-athlete specific LLPs will be evaluated to help improve the quality of the SA experience.

Self Perceptions of Body Image, Weight Control Practices, and Body Composition in NCAA Division I Female Athletes

Polina A. Volgunina (Dr. Takudzwa Madzima & Dr. Svetlana Nepocatych) Department of Exercise Science

Preoccupation with body weight may lead to unhealthy body image and weight control practices. This cross-sectional study assessed self-perceptions of body image, common weight control practices, and body composition of NCAA Division I female athletes. Female athletes (n=23) from basketball (BB) and cross-country (XC) teams completed a body composition assessment via bioelectrical impedance, a 69-item Multidimensional Body-Self Relations (MBSRQ-69) and a 25-item Weight Control Practices (WCP) questionnaire. The frequency of WCP and mean differences of body composition and MBSRQ-69 were compared between the two teams. Body weight (79.2 ± 13.2 kg and 55.7 ± 3.2 kg, $p > 0.001$) and BF% ($28.3 \pm 9.3\%$ and $20.2 \pm 4.8\%$, $p = 0.02$) were significantly higher in BB compared to XC athletes. Appearance, Fitness, and Health Evaluation, Overweight Preoccupation, Self-Classified Weight, and Body Areas

Satisfaction subscales of MBSRQ-69 were not significantly different ($p > 0.05$) between teams. However, Health ($p = 0.03$) and Fitness Orientation ($p = 0.07$) were higher in XC compared to BB athletes. In addition, athletes with higher BF% were less fitness orientated ($p = 0.004$) but more preoccupied with their weight ($p = 0.06$) and performed more WCP. The most common negative WCP included weighing themselves, while the most common positive WCP was increasing intake of fruits and vegetables and decreasing sweets and junk food. In addition to the physical demands of each sport, it appears that in addition to greater health and fitness orientation of XC compared to BB athletes, specific WCP may also explain differences in body composition.

Finance

The Impact of Venture Capital Funding Patterns on Innovation and Success

Clarence M. Mourot (Dr. Kate Upton) Department of Finance

This study contributes to previous literature on the role of venture capitalist in innovation by examining the patterns of how companies invest VC (venture capital) funds. A venture capital firm's goal is to identify, fund, and expand companies with strong growth potential. The focus of this study is to better understand how startup funding patterns, including frequency and amount, have an impact on the company's innovation and success. I seek to identify if there is an ideal combination of funding pattern to foster innovation and more broadly promote success through exits (IPOs and acquisitions). It is important to understand if VC firms effectively promote innovation and if that innovation is rewarded by the market. This study is conducted in two phases. First, I analyze the impact of funding patterns on innovation measures. Then I study the effect this innovation has on the ultimate success of the firm. To conduct the analysis, I extract data from Crunchbase Pro, a startup database compiling all funding information, investors and firm characteristics. The data is used in regression analysis with the main independent variables of interest being: number of acquisitions, IPO status and money raised, patents and trademarks and IT spending. These empirical results aid in the understanding of optimal funding patterns for encouraging innovation and ultimately a successful exit. We expect to find a correlation between the number of funding rounds/amount of funding with our measures of innovation, frequency of IT spending and patents/trademarks.

A Genetic Algorithmic Approach to Statistical Arbitrage Strategies

Zachary J. Lahey (Dr. Adam Aiken) Department of Finance

Statistical arbitrage trading strategies attempt to profit by identifying securities that are incorrectly priced. This research utilizes a popular statistical arbitrage trading technique known as pairs trading. The pairs trading technique looks to find two securities that have similar price movements. The idea of pairs trading was developed by a team of physicists, mathematicians, and computer scientists at Morgan Stanley in the 1980's. Statistical arbitrage strategies utilize statistical techniques to identify securities that have similar price movements and profit from "mispricing's" between the securities when the prices move away from each other and then converge. Although quantitative based statistical arbitrage strategies are an important tool to identify security mispricing's, their popularity has started to affect their profitability. Rad,

Kwong, Low, and Faff (2016) find that, since 2009, the number of trading opportunities has decreased significantly for traditional pairs trading strategies. In addition, they also found that during different market periods, some pairs trading strategies performed better than others. This project seeks to improve the profitability of statistical arbitrage trading strategies by applying a Genetic Algorithm optimization method to identify optimal parameters for these strategies. A Genetic Algorithm is a search algorithm that is modeled after Darwin's theory of natural selection. Like natural selection, there are five phases in a genetic algorithm: 1. Initial Population, 2. Fitness test of population, 3. Selection of best in population, 4. Crossover of best in population, 5. Mutation of the population. To test this method, equity price data from the year 1963 to the year 2017 was collected from The Center for Research in Security Prices (CRSP). The three different types of statistical arbitrage signals were used to identify statistical arbitrage opportunities, Distance, Cointegration, and Copula methods. The optimization method will be applied to identify statistical arbitrage trading opportunities over the 53 year period. This strategy will be benchmarked against industry standard statistical arbitrage strategies, comparing different portfolio metrics to test for outperformance.

Effects of the JOBS Act on IPOs of Biotechnology and Pharmaceutical Firms in the U.S.

Anthony J. Potenza (Dr. Margarita Kaprielyan) Department of Finance

Initial public offerings [IPOs] occur when private companies are taken public where they issue shares in order to gain access to broader capital markets. The IPO process can be very long, tedious, and costly. However, the Jumpstart Our Business Startups Act [JOBS Act], signed into law in 2012, served the purpose of making the IPO process easier and less expensive for emerging growth companies (EGCs). Two main provisions of the act with the largest beneficial effect on EGCs include: (i) de-risking provisions and (ii) de-burdening provisions. These provisions affect the levels of asymmetric information present in IPOs between investors, companies, and underwriters; thus, I expect to find that the JOBS Act affected the three underlying IPO phenomena by asymmetric information theories: (i) underpricing at the time of issuance, (ii) long term stock price underperformance, and (iii) high volatility of returns. With regards to my study, the de-risking provisions of the JOBS Act may have a greater impact on IPOs of Biotechnology and Pharmaceutical firms than others and recent studies show that IPO volume post-JOBS Act increased significantly for these industries. Due to the extremely large investments required for R&D expenses and product development, which often pose significant risks, the de-risking provisions may prove beneficial for firms in this sector by reducing costly proprietary disclosure costs associated with IPO registration process and ultimately freeing up capital for use elsewhere. This study serves to test whether these two main sets of provisions of the JOBS Act have a significant impact on IPO underpricing, long-term performance, and price volatility of Biotechnology and Pharmaceutical firms to estimate the benefits/risks for the industry and the investors. To test the hypotheses, I use multivariate regressions analysis with first-day return, long-run return (1 and 2-year buy and hold return), and annual return volatility as dependent variables. The independent variable of interest is the post-JOBS Act time indicator variable and I control for various firm characteristics, venture capital backing, and the emerging growth company status. I anticipate the findings to be consistent with the predictions of the asymmetric information theories.

History and Geography

Indigenous Women and Environmental Movements in Latin America: Exploring the Intersection of Gender and the Environment in Grassroots Participation

Krisandra L. Provencher (Dr. Shayna Mehas) Department of History and Geography

Contemporary environmental movements are increasingly incorporating social and economic critiques into their environmental activism, and are more attuned to intersectional issues of “race,” indigeneity, gender and colonialism. This research engages with this phenomena through an analysis of the roles of indigenous women in grassroots environmental movements in Latin America. It asks why, now, have indigenous women emerged at the forefront of environment movements in the region. Beginning in the pre-colonial period and moving forward through time, gender identity and the significance of the environment are explored to better understand how current indigenous women have come to identify as protectors of the natural world by participating in or leading these movements. This involves an interrogation of ecofeminist perspectives, Latin American feminist texts and various indigenous actions throughout history, including the Zapatistas of Mexico, the Alcaldes Mayores Particulares of Bolivia and the Madres de la Plaza de Mayo of Argentina. Using such previous research and historiography as a guide, this investigation looks into three grassroots environmental movements or organizations across Latin America: la Asociación de Desarrollo Económico Sostenible Unidos por Palestina (ADESUP) in Peru, the Association of Sapara Women (ASHIÑWAKA) in Ecuador, and the Peaceful Resistance of La Puya in Guatemala. In speaking to the development of these movements, this research discusses their roots at intersection of environmentalism, Indigenism, feminism and neo-liberalism. Together, the interrelated nature of these ideologies have come together to shape these movements in conjunction to their geographical history. Moreover, with similarly structured foundations, these movements have come to form a network of support at regional and global levels. While they are individual movements with their own group identities, their vast commonalities will be emphasized in this research as a lens through which the more global theme of fear in the modern patriarchal system, particularly in regards to giving up one’s domain of control and power, can be analyzed.

Human Service Studies

LGBTQIA Young Residents of Alamance County, NC

Amy E. Belfer (Dr. Carmen Monico) Department of Human Service Studies

This study explores the needs of young LGBTQIA residents in Alamance County, North Carolina. It determines what services are available and accessible, where the gaps in existing services are, and how existing services can be improved. Nationally, LGBTQIA+ individuals face a number of issues including mental health issues, bullying, harassment or abuse, homelessness, and body image issues, among others (Crothers et al, 2017; Rusow et al, 2018). Minimal research has been conducted in North Carolina on LGBTQIA youth and none has been conducted in rural Alamance County.

In this study, eight LGBTQIA youth aged 18 to 24 and nine service providers of LGBTQIA youth were surveyed and interviewed. The software Dedoose and methods including induction, deduction, and synthesis were used to analyze and code the data. The young LGBTQIA residents that participated and service providers to this population reported that youth experienced depression, anxiety, bullying, harassment, and abuse. They conveyed an immense need for resource development and fair access to resources, and the necessity for more inclusive, safe spaces and protective policies. They indicated that service providers in Alamance County must have the necessary training to provide culturally sensitive services to LGBTQIA young residents. These results are being used to make recommendations to local service providers, county officials, and LGBTQIA groups.

The Deportation Threat and It's Health Impact on Hispanic Immigrant College Students: A Leadership Prize Project

David M. Duncan (Dr. Carmen Monico) Department of Human Services

Annually, 65,000 undocumented high school graduates become eligible to attend universities and colleges within the United States (Lopez, 2010). Along with the provisional citizenship of the Deferred Action for Childhood Arrivals (DACA) program, a new wave of temporarily secure young adults now seek higher education. Nevertheless, these students must still surmount a number of barriers before attaining this education (Colotl, 2017). The fear of deportation has perpetually shadowed their lives, but has recently increased since the new administration's prioritization of border security (Park, 2017). This fear, motivated by an uncertain future, renders students vulnerable to several damaging psychological phenomena like ambiguous loss and trauma. These negative emotions can lead to depression, rejection, and insecurity including high levels of fear and anxiety. The authors conducted a study examining the experiences of Hispanic immigrant college students, particularly Deferred Action for Childhood Arrivals (DACA) recipients, regarding the deportation threat they face under the Trump Administration's decision to rescind their status. The study focuses on the health impact of that administrative decision, particularly the effects of their fear of deportation on the mental health of these students. Using semi-structured, mixed method interviews, the research team conducted thirteen, 50-70 minute interviews with students from a variety of citizenship statuses ranging from temporary protection to no documentation. Data was analyzed using Dedoose for qualitative data and Excel for quantitative survey data. Using codes inferred in data analysis, risk and protective factors were identified. The study found that many participants have experienced deep emotional trauma since their arrival to the U.S. beginning during their childhood years, and in some cases, they have developed maladaptive behaviors. The study also identified coping mechanisms used throughout their lifespan to minimize adverse effects. The project goal is to develop a workshop for creating allies among college students, faculty and staff. This project was completed under the structure and funding of the Leadership Prize.

Older Sibling Perceptions of Family Roles in Bilingual Households

Nicole M. Harrison (Dr. Judith Esposito) Department of Human Service Studies

The development of an individual begins in the home, with the early language environment playing a critical role in the creation and establishment of language abilities (Suskind, 2016;

Schmitt, 2011). Within the family itself, each member influences the overall dynamics and interactions present in the household (Suskind, 2016; Schmitt, 2011; Gathercole, 2014). Sibling relationships are pivotal in the early language development that occurs in the home, particularly in the way older siblings interact with younger siblings (Oshima-Takane, 1996; Pinel-Jacquemin, 2013; Woollett, 1986). For bilingual households an added dimension is present in children's early language environment, further impacting family roles and dynamics (Gathercole, 2014; Hoff, 2013). This research critically examines the early language environment of bilingual households from the perspective of older siblings. Researchers utilized a mixed-methods design of questionnaires and semi-structured interviews with older siblings who were raised in bilingual households. Initial analysis highlights family roles, cultural norms, language fluency and preference, and intra-familial relations as primary themes in the early bilingual household.

iAct: A Student Led Active Bystander Program

Adrienne M. Hayes (Dr. Carmen Monico) Department of Human Service Studies

In recent years, sexual assault has become an increasingly prevalent issue on college campuses in the U.S. The iAct initiative is a one-time student led active bystander program that aims to combat sexual assault on college campuses. Structured into three sections, these one hour student led discussions aim to educate students about sexual assault on college campuses, how to safely and effectively intervene, and provide a comprehensive approach to student rights. Sessions include ample time to discuss specific situations where sexual assault could occur and how to be an active bystander. Student led sessions work in collaboration with the Gender & LGBTQIA Center, residence halls, health promotion programs, and Fraternity and Sorority Life. During 2017, fifteen students were trained as facilitators by undergoing a four hour workshop. Fifty-nine students were reached, through collaboration with residence halls and on-campus organizations. Pre and post tests were used to measure the knowledge acquired, skills built, and attitudes changed among participating students. Preliminary results indicate a significant positive growth rate in knowledge and skills among program participants regarding what constitutes sexual assault, how to safely intervene in situations, and the campus resources available to them. The greatest participant growth occurred in resource knowledge (22.40%) and safe intervention knowledge (18.60%). The program has continued into 2018 and data collection is ongoing during Spring 2019. The research project will enable a greater institutional commitment to organize iAct trainings in resident halls and to learn more about the best practice of sexual assault prevention in North Carolina.

Caseworkers' Perspectives of the Accessibility and Effectiveness of Services for Biological Parents in the Foster Care System

Alexandra A. Marek (Dr. Bud Warner) Department of Human Service Studies

Reunification between biological parents and their children in the foster care system is a common goal among the government, the families, and the caseworker. Nevertheless, there is not an overwhelming amount of research that thoroughly examines the biological parents' experiences in the system and how their experiences influence their chances of being reunified with their child (Schofield, Moldestad, Hojer, Ward, Skilbred, Young, & Havik, 2011; Alpert, 2005). In addition, how caseworkers view the services being provided for biological parents has

not been deeply investigated (Schofield et al., 2011). The goal of this research is to provide more insight on the experiences of the biological parents from caseworkers' perspectives in order to determine how accessible and effective current services are in reunifying parents with their children. The research questions that this study explored are: From a caseworker's perspective, to what extent are biological parents of children in foster care obtaining and utilizing mandated services when the goal is reunification? How effective are these services in reunifying parents with their children from the caseworker's perspective? A qualitative study was conducted through the use of two structured focus groups composed of Department of Social Services (DSS) workers, with a total of 10 participants. The themes that emerged identified a variety of factors that impact the accessibility and effectiveness of services. These themes included relationships between the caseworker and the biological parents, the consistency and availability of services, trust and perceptions among those involved in the foster care system, and success. By addressing at least one of the factors identified, the foster care system could be strengthened, biological parents and children can potentially have better access to effective services, and more biological families may be able to achieve long term reunification.

International and Global Studies

Diversity on National High Courts: A Comparative Analysis of Background Characteristics Predicting the Likelihood of Selection for the National High Courts of Australia, Canada, the United Kingdom, and the United States of America

Genna M. Kasian (Dr. Elisha Savchak-Trogon) International and Global Studies Program

In recent years, scholars have become increasingly aware of the importance of background diversity of those who serve on our highest courts. Existing research within the field of judicial politics is primarily focused within the context of the United States, where prominent themes are evident. Judicial diversity is important not only for the court to be representative of the population they serve, but also to contribute to the legitimacy of the institution itself as well as has the ability to impact the decisions of the court. This project seeks to determine whether these characteristics identified within the United States' judicial system are applicable in other countries at their National High Court. Variables of interest include: judicial experience, legal education, experience in private practice, age, gender, race, among other background characteristics. These variables will be examined to determine if they function as factors impacting likelihood of selection to the National High Court in Australia, Canada, the United Kingdom and the United States using data from the 82 judges who have served on the courts from 2000-2017. Judges' biographical information will be gathered and analyzed for trends. Ultimately, we expect to find that similarities exist outside the context of the United States because all four of these institutions have developed from English common law. However, each country has individual selection processes and varying levels of commitment to diversity within the judiciary which may result in differences among country's results. This project provides a foundation for future research within comparative judicial politics which will help us to have a greater understanding of political and legal values in other judicial contexts as well as the importance of diversity and representation in other National High Courts.

A Return to the Cradle of Mankind: Migration to Ethiopia from 1991 to 2018

Marta L. Djalleta (Dr. Andrea Sinn) International and Global Studies Program

The research to be introduced in this presentation examines the recent and noticeable increase of migration to Ethiopia by asking: What are the motives to migrate to Ethiopia between 1991-2018 and what are the country's organizational and policy responses to this migration? The research examines this specific time period because 1991 was the end of the communist regime in Ethiopia, and because Ethiopia is still receiving migrant populations today. While there have been studies conducted on cultural pockets of migrants in Ethiopia, there is a lack of research on the collective migrant population during this selected time period. Moreover, much of the research on migration and Ethiopia is solely focused on the migration out of Ethiopia, and fails to examine the prevalent migration into Ethiopia. In addition to studying the push and pull factors for migrants moving to Ethiopia, this research also examines how the Ethiopian government and other international organizations have responded to these arriving populations. At a time during which the expatriate community in Ethiopia is constantly growing, this research focuses particularly on migrants from four case study countries: South Sudan, Eritrea, China, and India. This research examines South Sudan and Eritrea because they are the two most frequent sending countries. As for the two Asian countries, they both have historical economic ties to Ethiopia that still foster steady migration to this day. The sources for this research include journal articles, book chapters, and current news articles, which explore Ethiopia as a destination country, its growing economy, the push and pull factors to migrate from these selected countries, and the organizational and political responses to these migrant populations. Research within these sources have concluded that people that migrate from South Sudan and Eritrea are fleeing war and authoritative dictatorships and are in search of economic opportunities and a safer, more politically stable environment. Chinese and Indian migrants are also drawn to Ethiopia's growing economy, specifically within the infrastructure and agro-farming sectors. Furthermore, the governmental and organizational response to these migrant populations have been largely positive and welcoming, with initiatives that promote migrant integration into Ethiopian society.

Cultural Exchange in Montagnard Immigrant Families: An Intergenerational Case Study

Faith E. James (Dr. Pamela Winfield & Dr. Xiaolin Duan) International and Global Studies Program

Many immigrants struggle when they first settle in a new country. Learning the language, finding a job, and building community are all challenges new immigrants may face, and tense immigrant relations in the United States only contribute to the challenges of acculturation (Charles Dunst & Krishnadev Calamur, 2018; David Rogers, 2017; Ian McDowell, 2019). Previous studies of the Montagnard people, a collective term for the diverse indigenous tribes of Vietnam, have focused on diet and health changes after immigrating to the United States (Causer et al., 2005; Chang et al., 2013; Matisz et al., 2011). Other studies focus only on culture loss (Bailey, 2002; Rumbaut & Ima, 1988; Ying & Han, 2007). However, a more nuanced, intergenerational picture of what immigrant families experience in a new country is required to ameliorate their transition process and maintain Montagnard cultural identity after resettlement. Using secondary sources on Montagnard history, immigration studies, and original surveys and interviews of the Montagnard immigrant community in Greensboro, North Carolina (N=10), this study investigates what is lost

and what is gained in intergenerational cultural transmission. The researcher found that language and some cultural values and practices of the Montagnard people are being lost. However, younger Montagnard people are helping their elders adjust to life in the United States through translation and introducing them to some aspects of U.S. culture, like food and holiday celebrations. The questions raised by this study warrant further research into Montagnard culture and acculturation experiences within the community. And since it accounts for 90% of all Montagnard immigrants in the United States, the Montagnard community of North Carolina is an ideal community with which to work.

Framing the Immigrant Narrative: How News Media and Immigrants Portray Immigrant Stories in North Carolina and Costa Rica

Diani M. Teixeira (Dr. Laura Roselle) International and Global Studies Program

Immigration, in both the United States and Costa Rica, is a contested topic, with both the news media and immigrants themselves potentially having power to shape immigrant narratives. This project analyzes both news media, articles from *The Raleigh News and Observer*, *La Nación*, and *The Tico Times* from 2014-2016, and immigrant portrayals of immigrant narratives, an autobiography, play, and photography exhibit. Looking at both news media and immigrants' own stories allows for the comparison and analysis of hegemonic narratives versus counternarratives. This comparison is crucial in developing an understanding of the conversation that happens between the majority and minority narratives. Using qualitative content analysis (QCA) to analyze the depiction of immigrants across the different media, the hypotheses that news media would present a negative portrayal of immigrants and immigrants would focus on their own lived experiences were tested. After coding the media using QCA, it was found that while Costa Rican Spanish news framed immigrants in a negative light, the *Raleigh News & Observer* tended to vary its framing. In contrast to the original hypotheses, immigrants attempted to prove their deservingness of being in their new communities and value they add to their new communities. This framing may be in response to negative narratives coming from news media, which overall, seem to imply that these narratives of immigrants in the news have powerful and lasting ramifications.

Management and Entrepreneurship

Reexamining the Demand for Human Resource Certification in the United States

Jenna E. Bayer (Dr. Brian Lyons) Department of Management and Entrepreneurship

Given the addition of new Human Resources (HR) certification offerings by the Society for Human Resource Management (SHRM) and the increase in HR certifications being awarded by the HR Certification Institute (HRCI), it is necessary to investigate the current rate of demand for HR certification and explore practical implications for those within the field. With increasing evidence regarding the impact of HR certification on job performance, it is beneficial for both organizations and job applicants to be aware of current demand levels for HR certification. This study analyzed over 5,300 HR job announcements and found that 20.7% demanded (preferred and/or required) HR certification, with more *requiring* HR certification than before and HRCI being the most cited brand of HR certification. Additionally, HR certification demand was

positively related to experience, education level, and job title, with demand reaching 33.7% for managerial HR roles. Results also suggested that the salary listed by announcements demanding certification was 27.9% higher than the salary listed by announcements that did not demand certification. Finally, the demand for HR certification differed by industry. These results directly contribute to the literature on HR certification demand and have practical implications to organizations, HR practitioners, and the entire HR profession.

Ethical Decision Making: Corporate Leadership in the Wealth Management Industry and their ethical responsibility to Investors

Alec Bijou (Dr. Jay O'Toole) Department of Management and Entrepreneurship

The wealth management industry requires professionals with high integrity and ethical decision-making standards according to the fiduciary standards of the Certified Financial Planner (CFP) and other regulatory agencies. CFP's periodically fail to follow ethical standards opening the public and corporate investors to significant risks such as management with low integrity potentially causing disastrous rate of returns on the investment, for example. The purpose of this project is to examine a specific dilemma faced by current leadership of a hedge fund firm in the United States by identifying legal and ethical decisions made by the management team. Through this research I will be writing a pedagogical case study to be used in classrooms to further the discussion of business and ethics. I plan to discuss the general role of a wealth manager and the distinct experience he has had with a potential ethical dilemma, focusing on ethical responsibilities of executive management and co-investors. Between investor responsibility and a potentially mismanaged leadership, this case study will formulate a background for students to discuss and debate a significant ethical dilemma. This case study will apply to all levels of business leadership and decision making in the form of an educational case study to allow leaders in the corporate world better understand the scope and implications of ethical dilemmas.

Examining the Influence of Organizational Cultural Values on Employees' Organizational Citizenship Behavior

Chloé A. Dardenne (Dr. Brittany Mercado) Department of Management and Entrepreneurship

As the workforce becomes more diverse and demands on employees more intense, it becomes more important to understand how culture influences performance. This study examines the impact of organizational cultural values on employees' voluntary work behaviors. At the societal level, Gelfand and colleagues (2011) established the cultural value of tightness/looseness (TL), which refers to the strength of social norms and the level of tolerance for deviance within cultures. The tighter a culture is, the stronger its social norms and the lower its tolerance of deviant behavior will be. Recent research has extended this cultural value to the organizational-level (Kim & Toh, 2018), as well as empirically demonstrated that employees in tighter organizations engage in fewer negative, deviant behaviors within organizations. This study investigates the other side of that coin: How might organizational TL influence *desirable*, yet voluntary (and potentially nonnormative) work behaviors? One such group of behaviors is organizational citizenship behaviors (OCB), which are positive employee behaviors and actions that are not mandatory job tasks but are beneficial to an employee's team and organization (Organ, 1988; Podsakoff, MacKenzie, Paine, & Bachrach, 2000). Because these behaviors

greatly contribute to organizations (Podsakoff, Whiting, Podsakoff, & Blume, 2009) we seek to understand if employees' perceptions of a work group's culture as tight or loose impact their engagement in OCB. Despite OCB's strong influence on employee and organizational performance (Carpenter, Berry, & Houston, 2014), the current academic literature insufficiently addresses the role of organizational cultural values on these extra-role behaviors. To examine these relationships and thereby address this literature gap, data is being collected via an online survey of full-time employees reporting about their work environments and behaviors. In this presentation, findings based on empirical analyses will be provided and practical implications will be discussed. Ultimately, this study complements the existing scholarly literature on the role of organizational culture and as a result, aids understanding of employee performance.

Exploring the External Complexities of Reducing the Line at Mail Services

Christian P. Frey (Dr. Sean McMahon) Department of Management and Entrepreneurship

With the increase in popularity of online shopping, mail and package centers across the country have seen a massive influx in package volume over recent years (USPS, 2019). The same phenomenon can be observed at colleges and universities as well. Locally here at Elon there is a perception of long wait times for package and mail pickup. The goal of this research is to shed light on the external complexities of this matter and to help illustrate why an effective, long-term solution has yet to be executed. Then, armed with a more complete understanding of the problem, our hope is to introduce new technologies to potentially reduce the wait times. For our research we examined potential problems associated with data collection methodologies and limitations of the findings. We also investigated the challenges of changing student behavior as they pertain to package and mail pickup. One of our primary findings for data collection is that it calls into question the validity of self-reported data. Another uncovered potential problem as it relates to collection is concerns for the maintenance of personal privacy. As for extrapolation of results, many factors play a role in determining peak wait times. There is difficulty in quantifying the effects of variables such as class schedule structure, the weather, and holidays to name a few. This inherent uncertainty exemplifies the difficulties of isolating contributing factors that could ultimately be targeted for solutions. Ironically, while the increased access to social media has made it easier to share information, this flooding of posts from users actually reduces the likelihood of illicit behavioral changes in the form of shifting pickup times by students. Overall, the long line at the mail center is a product of a combination of factors. Any successful solution will likely need to address most, if not all, of the challenges presented in this research. Our proposed solution will utilize technology which will help to reduce on any self-report biases without infringing on the personal privacy of others. Our research with this is ongoing, and we are still working towards determining a major conclusion at this time.

Understanding Job-Hopping Motives across Cultures and Personality Traits

Charlotte Jaecker (Dr. Robert Moorman) Department of Management and Entrepreneurship

Recent research suggests that organizations that fail to successfully use and retain talented employees suffer a competitive disadvantage with significant financial consequences (Baron, Hannan & Burton, 2001; Glebbeek & Bax, 2004). Therefore, it is of interest to learn about what drives employees' individual career choices and the success of organizations in general. This

study's goal is to contribute to current research on job-hopping by exploring whether differences in culture and personality explain differences in job-hopping motives. The relationships between two job-hopping motives (escape, career advancement), three cultural dimensions (Uncertainty Avoidance, Short-Term vs. Long-Term Orientation, Indulgence vs. Restraint), and five personality traits (Openness to Experience, Conscientiousness, Extraversion, Agreeableness, Neuroticism) were investigated. A questionnaire was completed by 311 respondents from the United States, Germany, and Italy. Although respondents with different nationalities were found to differ in their use of motives for job-hopping, the investigated cultural dimensions failed to explain these differences. The study's hypotheses received only partial support: cultural dimensions of Uncertainty Avoidance and Indulgence vs. Restraint influence people's use of the career advancement motive. In terms of personality, Conscientiousness, Agreeableness, and Openness to Experience were related to the escape motive; Extraversion and Agreeableness were related to the advancement motive. Political, social and especially economic circumstances may influence an individual's use of the motives and their effects may suppress those of culture and personality. Future research should take them into account when exploring the investigated relationships.

The Future of A.I. and Its Implications Regarding People's Behavior towards This Emerging Technology

Yann Martail (Dr. Jay O'Toole) Department of Management and Entrepreneurship

As the role of Artificial Intelligence (AI) in society grows, many concerns are starting to emerge regarding its implications. Dystopian movies like "The Terminator," "Blade Runner," and "Minority Report" do not depict a positive image of the AI-enabled future. When people think about AI, those visions often come to mind, but the reality is likely to be much different. In early autonomous machines, from the Roomba vacuum cleaner to the robotic arms on a car-production line, basic automation has resulted in mostly-positive impact, helping people save time, improve safety, and raise productivity and the quality of outcomes. However, general, more human-like AI is different. While basic automation has resulted in the creation of machines programmed to do simple, specific tasks, general artificial intelligence is designed to simulate human thinking. Current questions and concerns about AI relate to where its limits stand today and how likely they are to change. We already know that its use in business is increasing significantly, especially in the domains of finance and accounting. An important question to ask in the aforementioned field is "will it possibly take over most or all of the work in these fields?" Other questions include "in which other sectors of human activity is AI likely to replace people?" Through secondary research and a survey-based study, my goal will be to summarize current knowledge in the AI sector and examine how it might potentially affect people's behavior as they begin to more clearly understand its likely impact. Artificial Intelligence is changing the face of business. New approaches must be undertaken in order to better inform people, help them understand its implications and address the best approaches to create a bright future.

How Strategic Positioning Influences the Commercial Success of Creative Performances

Tiphaine JW Soller (Dr. Jay O'Toole) Department of Management and Entrepreneurship

This paper is focused on the influence of positioning on the ultimate success of creative performances. Firms in the performing arts employ strategic positioning to select market segment and to present their products according to their comparative advantage. As the respective industries of creative performances are subject to a surge of technological change, companies as well as artists and performers need to learn and adapt their marketing approach along with their market strategy in order to be successful. Through a management and marketing perspective, this paper outlines the consequences of strategic positioning and determines the effects these decisions have when it comes to reach the targeted audience and raise customer engagement. By means of the existing literature and data, this research discloses the constituent factors that determine creative performances positioning. By analyzing the different elements companies and performers rely on to determine their product strategy, it creates the possibility to compare these decisions with existing theories regarding the success of a particular product through the lens of their positioning. We expect to determine that larger companies tend to follow the main trends among their industry. They are more likely to imitate or promote products that are similar to previous successful creative performances; they generally select a vast market segment and establish a strategic positioning close to the main current trends, in order to improve their brand awareness and reputation along with reaching an extensive amount of customers. This results in commercial success in terms of sales and market share. On the other hand, smaller companies or independent organizations are more likely to target niche markets. By specializing in one segment, they can reach an oligopolistic market that allows them to create a competitive advantage. They aim for a narrow segment of consumers so they can raise more engagement and build a strong brand loyalty among their customers, securing their sales and commercial attractiveness.

Learning from Machines: A Closer Look at Supply Chain Agility in the Era of The Internet of Things

Annik B. Westermann (Dr. Haya Ajjan) Department of Management and Entrepreneurship

In today's ever-changing marketplace, a company's ability to be responsive and flexible are becoming critical for success and survival. The recent rise of the Internet of Things (IoT) offers a wealth of real-time information across the supply chain. However, a limited number of studies examined the IoT and its relationship to supply chain agility (SCAGI). This study offers a theoretical framework examining mediators and links between the use of IoT, responsiveness, flexibility, and SCAGI. The IoT offers real-time information and unprecedented transparency into all aspects of the supply chain, thereby providing early warnings of internal and external situations that require remediation. This enables companies to respond quickly and effectively to changes, enhancing supply chain flexibility, supply chain responsiveness and ultimately, SCAGI. To further explore the impact of IoT, data from a mid-sized US company (Company X) in the hygiene and services industry is collected. Five predictive models based on the K-Nearest-Neighbor, the Naive Bayes Classifier, and the tree algorithms, including best-pruned tree, random forest, and boosted tree, are proposed. The methods proposed demonstrate how IoT data can be processed and structured systematically to glean information quickly and to improve decision-making timeliness and flexibility within the company. Preliminary results point towards the deployment of the boosted tree algorithm for Company X. The theoretical model and empirical evaluation indicate the importance of the IoT in enhancing SCAGI. Based on the findings of this study, it is recommended that managers of Company X invest in the IoT, as well

as in human information technology capabilities and data mining skills to ultimately achieve SCAGI.

Not all Work Sample Tests are Created Equal: Investigating the Impact of Test Fidelity on the Predictive Validity of Work Sample Tests

Roxanna R. Wood (Dr. Brian Lyons) Department of Management and Entrepreneurship

Research has repeatedly indicated that companies should use valid applicant selection procedures (Ryan & Tippins, 2004). One selection method is a work sample test, or “a test in which the applicant performs a selected set of actual tasks that are physically and psychologically similar to those performed on the job” (Ployhart, 2006, p. 538). According to previous research, work sample tests have high predictive validity (i.e. potential of predicting future job performance). However, meta-analyses suggest that the predictive validity of work sample tests ranges from .33 to .54 (Roth et al., 2005; Schmidt & Hunter, 1998), indicating a large and unexplained variation. This study explores how the concepts of physical fidelity (i.e. how similar a test is to the physical environment of the job) and psychological fidelity (i.e. how well the test assesses the attributes needed for the job) can help to explain the variation in work sample tests’ predictive validity. It also explores the relative importance of psychological and physical fidelity in respect to their impact on the predictive validity of work sample tests. To study this relationship, physical and psychological fidelity rating scales were created based on the previous work of Schmitt (1993) and Ployhart (2006). Then, a sample of 38 work sample studies were collected. Each work sample test was rated on both scales. Total scores for physical and psychological fidelity will be compared to the general predictive validity of the test. Through this process, it will be determined whether tests high in physical and psychological fidelity also boast higher predictive validity scores. In addition, the relative importance of physical fidelity and psychological fidelity will be evaluated. It is our expectation that physical and psychological fidelity will impact the predictive validity of work sample tests and, based on preliminary analysis, physical fidelity may possess a stronger relationship with the criterion-related validity of work sample tests than psychological fidelity. These results will provide valuable information regarding the best practices for creating work sample tests, enabling practitioners to create more valid work sample tests and increase the effectiveness and efficiency of selection procedures.

Marketing and International Business

Country-of-Origin Effects: The Case of France

Alice Perseval (Dr. Lawrence Garber, Jr.) Department of Marketing and International Business

Country-of-origin (COO) effect is defined as the impact of the product’s origin on customers’ perceptions. Research has shown that marketers use different means of conveying COO, hoping to benefit from positive stereotypes of a particular country (Aichner, 2014). Some common examples of effective use of COO in the promotion of brands in the US include German cars, French wines and Swiss watches.

Though there has been a great deal written about COO effects in general, there is less research examining effects related to individual countries including France. Anecdotally, French COO has

proven to be widely used by brands to signal quality, hoping it might affect the consumers' likelihood of purchase. Also, the different strategies to convey COO have been conceptually defined in previous research but not empirically tested (Aichner, 2014). Therefore, it is my purpose to empirically examine two of the strategies listed – text and visual imagery – with respect to France as the country-of-origin. Does the American consumer perceive products differently when the country-of-origin is conveyed on the packaging, and by the manner in which it is conveyed?

Experimental participants solicited by means of Amazon MTurk will be asked to evaluate two new lines of French products being introduced into the United States, one an invented brand of cheese, the other an invented brand of candle, each represented by their package fronts and a short description. On each package, reference will be made to France as COO, either in text (e.g., the word “Paris”) or visually (e.g., a drawing of the Eiffel Tower). The product categories were chosen carefully with regard to their level of inherent association with French culture, certain kinds of cheese very much so, candles not so much. Brand evaluation will be measured at three levels: perception, liking and likelihood of purchase. A series of ANOVA's will be used to determine whether brands are evaluated differently depending upon whether the COO is conveyed verbally or visually, and whether a product's inherent degree of association with a given country is great or small. Results are to be presented. Theoretical and managerial implications are to be discussed.

Social Media Usage in Inside Business-to-Business Lead-Generation Efforts: A Qualitative Analysis

Maxwell Pivonka (Dr. Nawar Chaker) Department of Marketing and International Business

With the emergence of social media, 55% of business-to-business (B2B) buyers are using social media to learn more about possible solutions to their business challenges, a trend that is likely to continue to increase with time. Recognizing the emergence of social media as a way for buyers and sellers to connect, this research examines the current use of social media tools within professional sales settings, focusing primarily on its use in an inside, B2B context during the prospecting phase of the sales process. Previous scholarship has noted that social media can increase sales performance (Ahearne et al. 2007), but its effectiveness is diminished if there is not a formal strategy presented for how to use these tools (Andzulis et al. 2012). Despite previous scholarship demonstrating the importance of strategy, more recent scholarship has determined that the emergence and use of social media has not necessarily shortened sales or prospecting cycles, citing the lack of formal strategy around utilizing this new technology (Seredakis et al. 2015). In addition, most of the current research that's been conducted has been surprisingly quantitative in nature. Despite the prominence of quantitative research, it fails to uncover the practical application of social media in the prospecting phase. Recognizing these gaps in the literature, this study takes a qualitative approach in order to more deeply and thoroughly understand how inside B2B sales representatives use social media in their prospecting efforts. More specifically, in-depth interviews are conducted, recorded, and collected with industry professionals to the point of theoretical saturation. Then, using the well-established guidelines of grounded theory, these recordings are transcribed and analyzed using open, axial, and selective coding, using a sales faculty member as a reliability check. The findings are expected to highlight how social media is currently being used in inside B2B sales during the prospecting phase by presenting these findings in a way that can be utilized by

managers and sales professionals to formulate a more specific strategy for how to best use social media when connecting with potential buyers.

The Effect of a Dimorphic Response to a Cute Stimulus on Consumer Perception, Liking, and Purchase Intent

Sophie L Scharrer (Dr. Lawrence Garber, Jr.) Department of Marketing and International Business

Cute aggression is a form of emotional response to a cute stimulus. By it, people react in a “dimorphic” manner, meaning they show signs of aggressive behavior towards the stimulus even though they feel no aggression (Aragón et al., 2015). It is assumed to serve regulating feelings of being overwhelmed by the cute stimulus, to which some people are more prone than others (Aragón et al., 2015). As per our knowledge, cute aggression has not yet been extended into a marketing context, and therefore this study tests the proposition that a cute aggressive response differs from a merely cute response on the levels of brand perception, liking, and purchase intent. Further, it asks whether the positive brand perception of people who exhibit a dimorphic response extinguishes faster than the positive brand perception of people who do not exhibit a dimorphic response. An advertisement for a fictional camera brand was created that included a display of a camera and a cute baby whose physical features were manipulated to represent two levels of cuteness – one cute, one cuter. Participants were randomly assigned one of the manipulations and asked to rate the camera, advertisement, and baby on a number of attributes. Half of each of these groups were also assigned a 35 second time delay task prior to rating the camera, advertisement, and baby. SAS PROC TTEST was used to test the significance of the difference in mean ratings across the manipulations. None of the results were significant. This lack of results might indicate that cute aggression does not affect consumer behavior. Alternatively, this lack of result may be an artifact of the experiment as it was designed. This latter possibility is indicated by a failed manipulation check: the mean rating for the attribute “cuteness” for the cuter baby was not significantly greater than the mean for the merely cute baby ($\text{Mean}_{\text{cuter}}=5.06$, $\text{Mean}_{\text{cute}}=5.02$, $t=0.40$, $p=.6879$); in spite of the fact that this baby as a cute/cuter manipulation was validated and successfully employed in earlier studies. Possible design reasons for this failure are discussed, along with theoretical and managerial implications had the experiment succeeded.

Mathematics and Statistics

A Complete Determination of 2-Adic Polynomials of Degree Twice an Odd Number

Briana J. Brady (Dr. Chad Awtrey) Department of Mathematics and Statistics

Polynomials with 2-adic coefficients (that is, the coefficients are essentially infinite binary strings) have many important applications in the fields of mathematics, physics, and cryptography. Consequently, it is important to be able to determine when two such polynomials have the same arithmetic properties; i.e., properties that are governed by the relationships among the polynomial’s roots. This is accomplished by computing the distance between the two polynomials, measured 2-adically. In the 1960s, M. Krasner showed that if this distance is small enough, then the two polynomials have the same properties. Moreover, if we consider the

collection of the infinitely many such polynomials of a fixed degree, it is possible to use the notion of 2-adic distance to separate these polynomials into a finite set of categories, with polynomials in each individual category sharing the same arithmetic properties and no two categories having exactly the same properties. One area of current research is focused on cataloging these distinct sets by answering questions such as: How many sets are there? What are the important properties for each set? Is there a best way (or canonical way) to pick a representative polynomial from each set? To date, previous research by many authors has answered these questions in the special cases where either the degree of the set of polynomials is odd or when the degree is less than 16. We offer a complete and general classification for the case where the degree of the polynomial is equal to twice an odd number.

Assessing Discourse Instruction in an Applied Calculus Course

Ryan J. Bernardi (Dr. Aaron Trocki) Department of Mathematics and Statistics

A challenge facing math educators at the undergraduate level is creating an atmosphere of accountability and engaged learning, which go hand in hand. Students who are more accountable will be more engaged, and students who are more engaged will be more accountable. Instructors must also accept responsibility for engaging their students in active learning, rather than a passive delivery of information. This proposal delineates the implementation of discourse strategies as well as other techniques to create a culture of accountability in the class among the instructor and the students. The purpose of this project is to document the effects of discourse strategies on student responsibility and engagement. When teaching is described as “to cause to learn,” the teacher is the expert and the bulk of responsibility is put onto the teacher when teaching. For this model to be successful, there must be a high level of accountability for each student. Alan Schoenfeld says that “What matters isn't so much ‘what I show the students’ as ‘what the students experience when they’re in the mathematics classroom’” (p. 12, 2016). This study analyzed multiple discourse strategies and techniques that worked to engage students and possibly enhance their experience in the mathematics classroom. To keep track of the amount of time spent engaging students, this study also analyzed the timing structure of each class, classified by how much time is spent on activities that involved engaged learning (e.g. discussions and small groups) compared to how much time is spent on activities that involve passive learning (e.g. lectures). Student perceptions of discourse techniques were documented in their responses to a post-course questionnaire. The results revealed several positive effects of engaging students and making them accountable for their learning.

The Mayer Markov Chain: Using Statistical Methods to Generate New Guitar Solos in the Styling of John Mayer

Robert L. Elmore (Dr. Andi Metts) Department of Mathematics and Statistics

From the smooth, sultry flair of Carlos Santana to the aggressive, thick style of Stevie Ray Vaughan, a guitarist’s personal sound and playing tendencies immortalize their music. In this research project, I will be using statistical methods to emulate and create new music in the styling of John Mayer. By transcribing dozens of Mayer’s best solos into the same key and using R, a statistical computing software, to conduct a Markov Chain simulation, patterns in Mayer’s playing will be observed. Markov chains observe assign probabilities to possible outcomes in a

string of events. Markov chains are used to predict patterns and probabilities within a series of dependent events, and can be applied to anything from weather to voice recognition personal assistants. In this case, notes will represent these events, and the order in which they are played will become a string. After assigning probabilities to each note's occurrence following any note that precedes it, a solo will be randomly generated that incorporates Mayer's individual playing habits. The project will utilize a minimum of thirty guitar solos, with more data teaching the chain to be more accurate and representative of the patterns included in the data given to it. The final results of the project will include a program that can transform tablature into data for the Markov Chain and a finished guitar solo with a distinct Mayer-influenced style. This technology can be applied to other artists to generate solos in the style of any guitar player with a large enough discography for the model to recognize patterns. A finished code and its applications in future music will be presented at SURF.

A Sensitivity Analysis on a Model of Dengue Fever Focusing on How Different Parameters Affect the Basic Reproduction Number

Isabel Gesen & Sydney Brown (Dr. Karen Yokley) Department of Mathematics and Statistics

Dengue fever is a mosquito borne illness that can affect as many as 400 million individuals on a yearly basis. Using mathematical modeling, we can better understand how certain factors impact the spread of the disease and potentially limit infections. Previous work involved the development of an SIR model representing humans moving between three different locations, known as "patches." One parameter in these equations is the number of alternative hosts, such as livestock and primates. Another parameter in the model is the recovery rate of infected humans, which was previously held constant regardless of the patch. In the current study, we investigate how changes in the recovery rate and the number of alternative hosts affect the basic reproductive number, which is a quantitative measure related to the likelihood of an epidemic occurring. Initial results indicate that raising the number of non-human hosts results in a decrease in the reproductive number. Preliminary results also suggest that differences among recovery times across patches may increase the reproductive number.

Cyclic p-adic Polynomials of p-power Degree

Peter Komlofske (Dr. Chad Awtrey) Department of Mathematics and Statistics

Published posthumously in the 1840s, the groundbreaking work of mathematician Evariste Galois shows that roots of polynomials have symmetries and that these symmetries encode important arithmetic information about the polynomial. One natural question to ask is: for a given collection of symmetries, which polynomials exhibit these symmetries? While the answer in most cases involves an infinite collection of polynomials, ideas of Marc Krasner from the 1960s allow us to organize these polynomials into finitely many sets where polynomials in a given set share all the same characteristics; including their symmetries. Organizing polynomials into these finitely many distinct sets involves using the notion of "p-adic distance" between two polynomials; the p-adic distance between two polynomials is essentially a measurement of how divisible by the prime number p their coefficients are. Current research therefore seeks to answer the following questions: for a given collection of symmetries, (1) how many distinct sets of polynomials are there? (2) Can we determine one representative polynomial from each

collection that is canonical? Much of the previous research in this area has focused on studying collections of symmetries that are “cyclic”; that is, they form the rotations of a regular polygon. In this context, answers to the above questions are known when either p does not divide the degree of the polynomials, p equals the degree, or the degree is less than 16. Extending previous work by Shigeru Amano in the 1970s, this project completely answers both questions for the cases where the degree equals p^2 and p^3 .

Classifying Ramified Polynomials of Degree $2p$

Ashley L. Pritchard (Dr. Chad Awtrey) Department of Mathematics and Statistics

Polynomials are of fundamental importance in mathematics and each has a set of specific characteristics, which makes it natural to ask when two polynomials have the same characteristics. One way of answering this question is to examine the “distance” between them. While there are many ways to consider “distance” between two polynomials, one that has proven to be most applicable to the fields of number theory and cryptography is to measure the extent to which a given prime number divides the difference of the polynomials’ coefficients. Results proven by M. Krasner in the 1960s show two things. If this distance is small enough, then the two polynomials have the same characteristics. We can place polynomials into disjoint sets in such a way so two polynomials are in the same set if and only if they have the same characteristics. Krasner showed that when we do this there are only finitely many different sets. Research has therefore focused on determining information about these sets, such as: How many are there? What are the important characteristics for each set? Can we systematically pick a representative polynomial from each set? In certain cases, answers to these questions have been determined by previous research, specifically when the prime does not divide the degree (known since the 1930s) or the prime equals the degree (known since the 1970s). We completed the case when the degree of the polynomial is equal to twice the prime number, building on recent work of N. Hadgis ‘18 and C. Awtrey.

Using a Linear Regression to Estimate the Average BMI of Individuals Aged 12-20

Mikaela A. Schultz (Dr. Ryne Vankrevelen) Department of Mathematics and Statistics

This study used linear regression to examine the relationship between Body Mass Index (BMI) and variables that might affect BMI for individuals aged 12-20. While BMI does not directly measure body fat, research indicates that it correlates to direct measures of body fat that indicate whether a person is underweight, normal weight, overweight, or obese. Data from the IPUMS (Integrated Public Use Microdata Series) website was collected. IPUMS is a large individual-level population database. The website contains census and survey data from around the world which makes it a great tool to compare and merge information across data types. The data from IPUMS was then imported to R, and cleaned to create a final model that can be used to analyze trends in average BMIs among different groups of individuals. Predictor variables such as health status, age, sex, race, income and many more were initially chosen to create a large linear regression model that predicted average BMI of groups of individuals. From these variables, backward elimination methods (along with considerations for redundant information) were used to create a smaller model that included age, sex, race and poverty level as important predictors of

BMI. Lastly, an R-Shiny app was created based on this model to allow interactive visualization of these findings.

Analysis of Potential Contributing Factors to Great British Bake Off Success

Kelly P. Simonson (Dr. Laura Taylor) Department of Mathematics and Statistics

The project that we have undertaken seeks to identify a relationship between early scores on Great British Bake Off (GBBO) episodes and success on the show as a whole. The GBBO is a British television show that follows a group of amateur bakers as they compete through a variety of baking challenges. Each week contestants participate in a technical challenge, which is a task assigned midway through each episode to assess bakers' abilities to replicate a complex dish resulting in a numerical ranking. We are investigating correlation between placement in the technical challenge each episode and placement in the overall competition for the second through seventh seasons through the use of SAS (a statistical software program). Preliminary results indicate that winners of technical challenges in early episodes have gone on to place well in the competition as a whole, so we have decided to conduct statistical analysis to see whether that relationship is statistically significant. The correlations that we have modeled so far can be expanded on in different directions, so we hope to share the findings that we have gathered thus far and receive feedback as to what direction our further research should take.

Predicting Professional Sports Team Records with Confidence Intervals

Ty Cryan, Karan Patel, Yousuf Siddiqui, & Kenzie Talhelm* (Dr. Ryne VanKrevelen),
Department of Mathematics and Statistics

This research attempts to predict at different points in the season how well various sports teams will do by the end of the year. We compared our methods for professional baseball, basketball, and hockey teams and checked how well they worked over the past 10 seasons. The ability to make these predictions might be useful for coaches, fans, and others with an interest in those sports. Rather than predict the exact record with which a team will finish the season, our approach focused on confidence intervals, which provide a range of possible records and our confidence that the team would end up in that range. We compared three different methods for calculating confidence intervals. The first two methods use only the team's record to that point in the season and the third method adds information about how many points the team has scored and allowed. We collected data from the ten most recent seasons (excluding shortened seasons) in our three sports and used R statistical software to check how often these methods correctly predicted a team's record. There were differences between sports in how well each method worked. In baseball, which has a 162 game season, all three methods performed consistently well for various levels of confidence. In basketball and hockey, which have 82 game seasons, the first method was successful less often than desired. The second method was successful more often than desired at the expense of providing meaningful predictions. The third method, which incorporated scoring worked well in all sports. These differences in methods were most pronounced at the beginning of the season and all methods performed similarly towards the end of the year. This research was conducted by students at Williams High School.

Music

Ugly Indie: Examining the Function of Imperfection in Indie Music Performance and Production

Charles J. Freedman (Dr. Cora Palfy) Department of Music

Indie music is generally accepted and defined as a genre of music that places strong emphasis on lo-fi and intentional imperfect recording and performance. Indie artists like Bon Iver, Sufjan Stevens, and Alexi Murdoch support these characterizations. The use of imperfection in both production and performance of indie music serves to reinforce the idea of human imperfection and vulnerability. Characteristics, such as nonmusical sounds (e.g. studio noise) and poor recording resolution, elevate the quality of music in this style because they act as markers of authenticity within the genre (Frith 1996; Covach 2015). Psychology shows that a connection exists between the aesthetic quality of music and personality traits and worldviews (Rentfrow & Gosling 2003). Lyrics, biographical history, and interviews complement these production techniques, which authenticates the vulnerability and fallibility of the artist. I will investigate how imperfection in recording techniques communicates the common threads of imperfection and vulnerability throughout the genre, looking at songs by artists such as Bon Iver, Alexi Murdoch, and Sufjan Stevens. These case studies, in addition to ethnographic research and artist interviews, inform my conclusion that imperfection is a crucial element of indie music which communicates authenticity to listeners.

Sounds of the Screen: Discovering, analyzing, and applying trends in film score from 1985-2017

Rachel C. Hopkins (Professor Clay Stevenson) Department of Music

The study of film score is a new, burgeoning field with room for growth and exploration. This study contributes to this emerging discipline by exploring nuances in the field, including methods for composing and building an action cue effectively, which can then be applied to real-world composition and classroom methods for teaching film composition. This study draws upon data gathered through in-depth interviews with professionals in the film scoring industry, as well as analysis of high-quality action cues based on both standard musical analysis, and factors highlighted in the previously conducted interviews. My research found several factors play a significant role in the effectiveness of an action cue, including the evolution of rhythm throughout a cue, the “orchestral groove,” connections from recurring melodic themes, impact points, harmonic devices, and significant melodic motion. My research shows that these devices are an integral part of the composition of an action cue, and how they can be applied effectively. Additionally, my research will use older films to demonstrate newer techniques by comparing the original score with a score developed based on elements codified in this project.

Searching for Greek Identity: Rebetiko’s Musical Expression of an Evolving Culture

Julianne Marie Papadopoulos (Dr. Victoria Fischer Faw) Department of Music

Rebetiko is a unique genre of Greek music which evolved from a subculture of Turkish and Greek refugees who emigrated from Asia Minor to the ports of Greece during the early 1920s. The music was originally performed in hashish dens and explored topics such as drug use, promiscuous behavior, and disdain for authority. My research demonstrates how the characteristics of rebetiko can and have been effectively adapted to meet the expressive needs of this cultural group as Greek identity developed during the early 1900s, the 1930s under the Metaxas Regime, the 1940s during World War II, and the 1960s to 1970s during the Junta Dictatorship. While there has been extensive research in other musical genres deeply embedded within the expression of a cultural or racial identity, there has not been nearly as much research on rebetiko music as a representation of Greece's national and cultural identity. My research uses visual and recorded examples to support a historical musicological analysis of three culturally significant rebetiko songs. These songs, "Fragosyriani," by Markos Vamvakaris, "Otan Pineis Stin Taverna," and "Synnefiasmeni Kiriaki," both by Vasilis Tsitsanis, illustrate the evolving musical style and cultural role of the genre. The music's unique instrumentation (the bouzouki), Turkish-influenced tonality, dance meters, and lyrical content work together to create rebetiko's unmistakably Greek sound. Drawing from the music's history and my musical analyses, I conclude that rebetiko acts as an effective platform for expressing cultural identity in two main ways. First, the music itself is rooted in Greek history, in that its genesis reflects the story of ethnically Greek refugees first playing the music along the ports of Smyrna in Asia minor. Second is the music's adaptability in its lyrics, harmony, and performance context, allowing for the people of Greece to make the music their own over the decades. These two factors in combination have allowed rebetiko to serve as an effective mode in expressing Greek culture and nationalism throughout history and even today.

Guess Who's Coming?: Demographic Information from the Leading Women in Audio Conference

Natalie J. Sulzinger & Jessica K. Burchett (Professor Fred Johnson) Department of Music

In 2016, the Audio Engineering Society (AES) conducted a survey and found that only about 5% of workers in the audio industry were women (Mathew et al., 2016). The proportionally lower involvement of women in the audio industry can also be seen in the enrollment in Music Production programs: In Elon University's Music Production program, less than half of the students are female. In comparison to Elon's overall population, around 60% female, the smaller population of women in the Music Production program is not chance; it is a reflection of the real world. In the Fall of 2018, a proposal to host a Leading Women in Audio Conference was created and two co-chairs, along with a steering committee, were selected to spearhead this conference and all its activities. The purpose of the Leading Women in Audio Conference is to highlight the roles and experiences of women in the audio industry and educate students, faculty, and visitors on this topic.

Given the opportunity to reach a wider audience interested in music production, I designed a survey to investigate the participation practices at the conference. The focal question that this presentation seeks to answer is what techniques make outreach to the music community and others successful: how we accessed people and encouraged them to sign up for this conference (i.e. via email lists, reaching out to studios personally, Google Forms, announcements, word of mouth). We will be collecting demographic information from willing participants to better

understand the attendees of the conference. Data will also be collected to examine participation at conference events, such as the banquet, retention from day one to day two, networking opportunities, and industry connections. We are also seeking to connect with non-Elon students and local professionals and allow them a chance to learn more about women in this industry from this experience. Our overall goal is to bring members of the music community—women and allies alike—together to acknowledge the greater issue and become more educated on this topic.

Hearing Motion Pictures: How Production Effects and Musical Elements Create a Realistic Experience within Movies

Kameron C. Williams (Dr. Cora Palfy) Department of Music

When audiences watch a movie, they have a cognitive connection between themselves and what's going on within the big screen. Whether it's the sound of rain falling onto the surface or birds flying and chirping from the distance, the sound alone makes people have a sense of place. But what are the key features within motion pictures that allow audience members to psychosocially feel as though they're in another environment? What are the neurological effects that make people believe that these auditory illusions are real? Certain production/auditory techniques (for example, placing surround sound monitors at 110 degrees for panning effects) and musical elements (such as the use of somber hymns and chants to represent a character who have died) within cinematography allow audience members to have a sense of what each scene is trying to convey. This presentation focuses on how production and audio techniques affect the human brain. I will demonstrate this by examining the psychology literature on immersion (Neuendorf, 2010) and blending this with my experience and knowledge of music production. This presentation will focus on examples of techniques that encourage immersion for audience members. For example, the movie *Blade Runner 2049* takes place in Los Angeles California with weather conditions consisting of heavy rain. Mark Mangini, supervising sound editor, wanted to have a more immersive sound of rain, hearing every trickle and drip that would land on the surface. Mangini used the holophone H1, Schoeps CCM microphones, and a custom rig that was one-meter square of absorptive material in order for the sound to have more detail. The musical score itself also underpins almost every scene's environment. Composers Benjamin Wallfisch and Hans Zimmer used manipulated sounds from the CS-80 analog synth to create futuristic tones that allow for the scenes to have an oppressive feeling. At the same time, Mangini used musical textures from wind chimes, and guitars to support the score, manipulated in a way that would sound more like a sound effect. Applying these features with certain monitor placements allows the movie to seem realistic. With the use of these techniques, the human brain allows audiences to feel as though they're a part of that non-existing world (Neuendorf, 2010).

Performing Arts

The Past is a Grotesque Animal Behind Us

Victoria C. Bond (Professor Renay Aumiller) Department of Performing Arts

How can a choreographer engage her or his performers to remain present and authentic throughout an entire performance? This question emphasizes molding an 'engaged performer,' which I define as someone who feels each moment of a set performance as if it was something

new and special, someone who does not get stuck in habits or routines of performing so that they can rely on their ability to function on autopilot. Choreographers and teachers often times use prompts in hopes to lead performers out of this monotonous mode of habitual moving. I wanted to explore the art of prompting in depth. I researched the outcomes of implementing schematic images and dancing metaphors into a rehearsal process. My methods for this process involved writing a Literature Review (about dance philosophers Einav Katan and Mark Johnson) and a Comparative Analysis (of choreographers Ohad Naharin and Crystal Pite, to see how they applied liminality, schematic images, and dancing metaphors into their rehearsal processes. The performers wrote their life stories which I then used to inform the piece's narrative thread. I integrated my observations from the analysis and literature review into my creative process to create a full-length dance that represents the performer's own experiences through movement, set design, and directional approach. *The Past is a Grotesque Animal Behind Us* is a dance that explores how revisiting one's own past experiences can help us understand who we were and how that shapes who we currently are. The piece revolves around a topic that every viewer can connect with, because we all have a history and we all have a present. The research and final product more specifically address how people can find joy in their routines through self-representation with imagery. Thus, prompts that use schematic images and dancing metaphors help dancers remain engaged and committed to the act of rediscovery and self-representation throughout an entire performance.

Movement as a Coping Mechanism when Dealing with Cancer, Loss, and Grief

Allison M. Ivan (Professor Renay Aumiller) Department of Performing Arts

My research is a practice-based study that focuses on how dance can be used as both a form of therapy and as a coping mechanism when dealing with cancer, loss, and grief. While loss and grief are universal concepts, the grieving process is extremely unique to the individual. Yet, despite this individuality, people often fail to properly grieve. Negative emotions such as unpleasantness, fear, and anger get repressed, resulting in physical, mental, and emotional ailments. However, studies have proven that movement allows these emotions to be externalized in a non-threatening manner, which initiates a conversation that words alone cannot adequately express. Through a comparative choreography analysis of ten dances that explored the concepts of cancer and grief, a qualitative movement analysis with ComMotion (a local company that provides social dance classes for cancer survivors), and in collaboration with eight Dance Performance and Choreography majors, I have learned how to incorporate dance/movement therapy practices and exercises into both the choreographic process and the final work. Through this evening-length dance, I demonstrate how my dancers use the healing power of movement to authentically cope with grief. This choreographic process was ingrained in authenticity and relatability, as seen through the incorporation of both personal narratives and gestures. This was crucial in creating a safe-space for both performers and viewers alike. Those present at the show can witness how my dancers use movement to re-establish a sense of normalcy, to create an escape from pain, to foster self-confidence, and to be an outlet for emotions in order to promote healing when dealing with loss. Through this creative research process, together, my dancers and I have learned that there is more than just aesthetic beauty to the art form of dance. Together, we have learned of movement's power and ability to initiate an open, honest, and authentic conversation about grief. Ultimately, my creative research has proven that movement can offer joy, freedom, and peace to anybody dealing with emotionally difficult times.

Creating Empathy: How Sensory Stimulation in Theatre Advances Audience Understanding of Holocaust Historiography

Jaclyn A. Kanter (Dr. Susanne Shawyer) Department of Performing Arts

French dramatist Antonin Artaud penned *The Theatre and its Double* in 1938 as a call to redefine the bourgeois theatre of 20th Century Europe. His proposed work hoped to redefine theatrical conventions—the feeling of comfort commonly expected during productions—and transform theatrical practices into something gestural, evocative, and capable of driving audiences to an emotional response encouraging social change. Ideally, the heightened emotional and sensory experience would create empathetic audience members with more profound understandings of social inequality. Artaud's theory of Theatre of Cruelty has been widely studied but rarely realized in modern theatrical practice, especially in regards to works not written specifically for his aesthetic. This research puts Artaud's Theatre of Cruelty into action, using sensory stimulation tactics in the production of a modern Holocaust drama to promote emotional responses that increase audience empathy towards marginalized people. Theatre of Cruelty techniques served as inspiration for a production of Martin Sherman's *Bent*, primarily implemented through immersive sound and lighting, scenic design integrating audience and stage action, and textural elements like rough wood and gravel. Audience members completed a pre-show and post-show survey to gauge both their reactions to the production design and their feelings of empathy towards onstage characters. Holocaust historiography techniques, such as the construction of immersive museum exhibits that explore the architecture of Holocaust memory, were also taken into consideration to determine how theatrical and historiographical tactics might work in tandem to produce deeper audience reactions. The research argues that the application of Artaud's Theatre of Cruelty combined with techniques commonly used in Holocaust historiography can create a more empathetic theatrical citizen drawn to social change. The research concludes that both Artaud's Theatre of Cruelty and the study of Holocaust historiography serve as a gateway in better understanding those who have been systematically oppressed, such as the victims of Nazi Germany. Ultimately, this research furthers understanding of Artaud's methodology while determining new ways to advance modern Holocaust historiography.

Comparing the Mental and Physical Aspects of Yoga to Determine Which Has a Greater Impact of Decreasing Performance Anxiety in Dancers

Keikichi M. K. Littleton (Professor Lauren Kearns) Department of Performing Arts

Background: In dancers, performance anxiety often interferes with the connection between the mind and body. This creates debilitating cognitive and somatic symptoms resulting in mistakes, and thus negatively impacting performance. Research has shown that yoga is a reliable tool that can be used to decrease anxiety in musicians, women, and collegiate student athletes. However, there has been little research conducted on the use of yoga as an intervention to reduce anxiety in dancers. This mixed-methods research project analyzes the various components of yoga (physical yoga practice and meditation) and how they can be used to decrease performance anxiety within college-age dancers. The purpose of this study is to determine if yoga is an effective tool to combat anxiety in dancers and what aspects of yoga are more effective at treating the symptoms of performance anxiety in dancers. It is anticipated that the results will

show a significant decrease in performance anxiety in the experimental groups and that there will be a difference in the reduction of performance anxiety between groups. *Methods:* 18 female university students volunteered to participate in this study and were randomly assigned to experimental yoga (EY), experimental meditation (EM) or control (C) groups. The EY and EM groups participated in a 6-week yoga- or meditation-based intervention that included both educational and practical activities designed to teach the basics of their assigned intervention. The Competitive State Anxiety Inventory-2 and the Performance Anxiety Inventory (modified for dancers) were administered to participants before and after the intervention, as well as on the day of performance. Basic questions about the study will also be asked to determine the participants perception of the intervention and its effectiveness. Statistical analysis, including ANOVA, will be performed to determine any differences between groups. *Results:* The data collection is currently being conducted; the subsequent analyses will be completed at the beginning of April. These results and a conclusion will be incorporated on the SURF poster. The practical applications of this study include: informing dance departments on the value of adding yoga and meditative practices into their curriculum and assisting dancers to reduce their performance anxiety.

Using Collaborative Theatre Techniques to Shape Perceptions of Inclusivity in Fraternity and Sorority Life at Elon

Sara E. Wasserman (Dr. Susanne Shawyer) Department of Performing Arts

Inclusive community is a main goal at Elon University. It is described on the university's website as one of Elon's core values, along with Diversity and Global Engagement. Fraternity and Sorority Life is popular at Elon University; however, many Greek organizations were founded over a hundred years ago on Christian values by students of Anglo-European heritage. My experiences as a religious minority student at Elon University led me to the question: How can devised theatre explore and intervene in perceptions of inclusivity held by Elon students about Fraternity and Sorority Life, in order to create a best practices action plan for Greek life? An online survey identified students' perceptions of inclusivity in Fraternity and Sorority Life, and the survey answers became the prompts for creative exploration in theatrical workshops. Devising methods used in the workshops included imagery work, Viewpoints exercises, Boal's Theatre of the Oppressed activities, and creative writing. During the workshops, participants spent six hours exploring perceptions of Greek life inclusivity through devising, deep discussion, and the generation of creative content around the issue. The survey and subsequent workshops informed my final product: a white paper outlining a best practices action plan for the Greek organizations at Elon University, which was then presented to key stakeholders. Hopefully this action plan will help enhance Fraternity and Sorority Life at Elon, and allow this culture to be more compatible with campus inclusivity initiatives.

Physical Therapy Education

Analysis of the Center of Mass and Center of Pressure Characteristics in Children with Idiopathic Toe Walking with and without the Use of Carbon Fiber Footplates

Abigayle P. Barker (Dr. Srikant Vallabhajosula & Dr. Melissa Scales) Department of Physical Therapy Education

Background: Idiopathic toe walking (ITW) is described as a pathological toe-to-toe human gait pattern that occurs in some children as they begin to walk. Human gait patterns can assist in recognizing and identifying individuals based on their walking characteristics. It is known that center of pressure data can assist in this recognition of normal/pathological foot patterns, which can be used in the clinical setting to help select the appropriate diagnosis and intervention for the child. Carbon fiber footplates (CFPs) have been found to be a promising intervention for children with ITW. However, it is not known how CFPs alter center of pressure and center of mass relationship. This relationship will be important to understand, as it will give insight into how the CFPs alter the biomechanics of the toe walker and lead to a more regular gait pattern. **Purpose:** To assess the center of mass and center of pressure characteristics when using the CFPs in comparison to walking trials without the CFPs. **Methods:** Otherwise healthy children ($n=16$, age 5.44 ± 1.5 years) completed 2 sets of 5 gait trials at a self-selected, comfortable pace across a 16-foot instrumented pressure-based walkway. During the first set, participants walked in their typical gait pattern without using the CFPs. During the second set, which took place immediately after the first set, participants had the CFPs placed in their shoes. The center of Mass-center of pressure related variables angle will be calculated using PKMAS software. Independent t-tests will be used to assess the difference in angle measurements between the trials with the CFPs and the trials without the CFPs. **Expected outcomes:** Based on previous research conducted by Yamaguchi et al., it is hypothesized that the center of mass-center of pressure angle will decrease as the center of mass approaches the center of pressure at initial contact, thus allowing the toe walker to maintain an upright position while walking without the CFPs. These results can potentially be used to better understand the difference in the biomechanics of a toe-walker with and without CFPs inserted to further support CFPs as a potential intervention for children who toe walk.

Impact of Acute Aerobic Exercise on Cue Reactivity in Heavy Episodic Drinkers.

Dara E. Sypes, Emily Phillips, Caitlin Osborn, & Sarah Hynes (Dr. Stephen Folger & Dr. Stephen Bailey) Department of Physical Therapy Education

Physical exercise has been shown to reduce craving for alcohol in alcoholics. There is a high prevalence of heavy episodic drinking in college-aged adults (18-29 years of age). This can be predictive of an alcohol or other substance use disorder developing later in life. **Purpose:** The purpose of this investigation is to examine the impact of acute aerobic exercise on cue reactivity to alcohol in heavy episodic drinkers. **Methods:** Seven participants (6 females, 1 male) (Age = 20 ± 0.44 years, BMI = 22.6 ± 0.59 , $\text{VO}_2\text{Max} = 32.014 \pm 2.14 \text{ ml} \cdot \text{kg}^{-1} \cdot \text{min}^{-1}$) completed 2 experimental sessions. Heavy episodic drinking was identified using an adapted version of the CAGE questionnaire. During one session subjects rested for 30 minutes and during the other session subjects exercised for 30 minutes at a moderate exercise intensity ($77 \pm 1\%$ of Peak HR). Sessions were randomized for each participant. Prior to and immediately following each session, EEG data were collected using a 64-channel system while subjects were exposed to 210 images (90 alcoholic drinks (ALC), 90 non-alcoholic drinks (NON)). Images were presented in a random order and proceeded by a fixation stimulus using a variable time span (0.5 to 1.5 sec). Mean amplitude and peak latency was calculated for P300 (300-380 ms post stimulus) in parietal-occipital electrodes. **Results:** Before exercise, subjects had a greater response ($p=0.002$) to ALC ($1.85 \pm 0.20 \text{ mV}$) as compared to NON ($1.47 \pm 0.21 \text{ mV}$). After exercise the response to ALC ($1.62 \pm 0.37 \text{ mV}$) was similar to that seen for NON ($1.72 \pm 0.31 \text{ mV}$). Before exercise the peak

latency was shorter ($p=0.025$) for ALC (325 ± 32 ms) compared to NON (366 ± 25 ms). After exercise, the peak latency was similar for ALC (313 ± 26 ms) and NON (323 ± 27 ms).

Conclusion: These findings suggest that acute aerobic exercise of moderate intensity attenuates cue reactivity to images of alcoholic beverages in heavy episodic drinkers.

Comparing Gait Variability and Static Postural Sway in Cancer Survivors with and without Taxane Chemotherapy

Elise Walton (Dr. Srikant Vallabhajosula, Dr. Elizabeth Evans, & Dr. Takudzwa Madzima)
Department of Physical Therapy Education and Department of Exercise Science

Gait variability and static postural control are often used as indicators of fall risk. As people age, fall risk increases with increased gait variability and poorer static postural control. Fall risk has also been studied in breast cancer survivors. However, it is currently unknown how taxane chemotherapy effects fall risk among cancer survivors. The purpose of our study was to investigate if taxane chemotherapy results in increased risk of falls among cancer survivors. In this on-going study, participants walked on a pressure-sensor based walkway for five trials each in the forward and backwards direction. Balance with eyes open and eyes closed was measured for all participants on a firm and an uneven/foam surface for 30s each. As of now, there are six participants among whom three of them had undergone taxane chemotherapy. Preliminary results show that those in the non-taxane group showed lesser postural sway during eyes closed/firm condition compared to eyes open/firm condition. Furthermore, forward gait velocity was faster for all six participants than backwards walking. This ongoing research will help add information on taxane chemotherapy and fall risks in cancer survivors. Cancer survivors with exposure to taxane may have decreased static posture control and increased gait variability than those who have not been exposed.

Determining the Effects of a Cooling Vest on Gait in Those with Multiple Sclerosis

Shreya P. Patel, Samantha Everett, & Chelsea Comeau (Dr. Srikant Vallabhajosula)
Department of Physical Therapy Education

Multiple Sclerosis (MS) is a progressive inflammatory disease that damages cells in the brain and spinal cord over time. The cumulative damage of MS leads to limitations in function, which may affect gait parameters such as step frequency, walking speed, stride length, and step velocity. Moreover, MS is associated with decreased physical and cognitive activity that manifest as fluctuations in walking, fatigue, loss of balance, faster increase in body temperature while doing physical activity, and attentional deficits. The purpose of this study is to explore how MS effects gait and if a cooling mechanism is beneficial in helping those altered gait parameters. Seventeen participants (mean age 54.1 ± 9.55) performed four 25-foot walk tests (25FWT) and two 6-minute walk tests (6MWT) under single and dual task conditions with and without wearing the cooling vest. Single task conditions consisted of two (25FWT) done in silence at a normal speed and fast speed followed by a timed 6MWT done at a normal speed. Dual task conditions consisted of two (25FWT) done at a normal speed and a fast speed while counting backwards by serial 3's followed by a 6MWT done at a normal speed while narrating a story. Participants wore inertial measurement units that measured gait during the 6MWT and 25FWT. This is ongoing research and data is being processed at the moment. A two-way

repeated measured ANOVA test will be used to compare fatigability with and without cooling. Specifically, walking speed, stride length, and step frequency will be analyzed and compared to investigate the effects of a cooling vest in MS sufferers. The expected outcome is that the cooling vest relaxes the muscles to help decrease fatigue and increase motor function resulting in more normal gait patterns.

Physics

Innovative Propeller Designs for the Future

Dan James Yameen, David George Norfleet, Charles Mullaney Walsh, & Jonathan Christopher Duen (Dr. Jonathan Su) Department of Physics

Traditionally, small-scale plastic propellers have been mass produced by creating a mold of the design and injecting it with raw material. This process, injection-molding, provides an inexpensive avenue for producing designs, but has the caveat of a large up-front cost to produce the initial mold. This model may be sustainable for mass production, but isn't conducive for prototyping. Our project's objective is to incorporate the speed and ease of 3D printing in the signature underwater vehicle design project that first year engineering students complete each fall in EGR121. With the increased turn-around from design to prototype, engineering students will be able to integrate elements of creativity in their designs with the added benefit of gaining experience with applying abstract thought. The significance of this research is to minimize costs of propeller production while maximizing the number of propellers. Our goal is to produce propeller designs more cost effectively by utilizing CAD software and 3D printers provided by the University. The designs were compared using a Bollard test, which measures thrust. The experimental results show that it is feasible to use CAD software and 3D printing to materialize original ideas as demonstrated in our data collection of multiple propeller designs given a relatively small time window.

Human Powered Water Purification

Skylar Barthelmes, Justin Smoot, & Stephen Blackwell (Dr. Jonathan Su) Department of Physics

An estimated 844 million people lack access to safe drinking water. Of those, 263 million people spend more than thirty minutes per round trip to collect water from an 'improved' source. The burden of water collection falls disproportionately on women. We have therefore designed a human powered water filtration system capable of filtering and transporting a family's supply of water for several days. We have designed this system to be easily maintainable and capable of being made out of readily available parts. This system is based around an inexpensive reverse osmosis micron sized filter and can be easily transported by bicycle on a trailer. An average family of four needs 52 gallons of water a day for cooking, cleaning, and hydration. Current hand pumps can filter approximately .2 gallons a minute by hand (about 12 gallons per hour). Therefore, using current technology, this would take just over 4 hours. In contrast, our prototype bicycle powered system is capable of filtering this amount in a quarter of the time, thereby not only providing easier access to clean, filtered water for millions of families in resource poor areas, but also giving them back the time they would ordinarily be using to transport water.

Modeling Capillary Action through Tube with Internal Rod

Carson N. Davis, Elena M. Lostoski, & Isaac J. Sasser (Dr. Jonathan Su) Department of Physics

When liquid comes into contact with a very small diameter tube, capillary flow results. This flow is a consequence of the difference in interactions between the molecules of liquid and wall material and the liquid molecules with each other. Capillary tubes have a variety of applications. One such application is microinjection, in which special glass capillaries containing a single glass fiber running along the interior are used. While existing equations can be used to model the flow of liquid through a cylindrical capillary tube, these equations fail to adequately describe the flow of liquid through a tube with a fiber. We have experimentally developed an empirical equation (1) which describes flow in a hollow cylinder with a single glass fiber and are currently in the process of developing a theoretical equation to generalize our results. This will contribute to general scientific knowledge of capillary action as well as facilitating practical applications of capillary action in tubes with internal rods.

$$y = A * B * e^{(-B*x)+C}$$

Sustainable Sanitation in the Developing World: Deactivating Parasitic Worm Eggs in Wastewater Using Electroporation

Michael H. Dryzer (Dr. Scott Wolter) Department of Physics

Having infected approximately one-quarter of the global population, helminth worms are a virulent family of parasites prominent in the developing world. Helminth eggs are incredibly resilient—possessing the ability to resist inactivation via treatment with most conventional sanitation methods. Determining a cost-effective and sustainable sanitation approach will lead to increased sanitizing capabilities in regions that otherwise do not have access to clean water and food. This research reports on the effectiveness of electroporation to inactivate *Caenorhabditis elegans* (*C. elegans*), a non-parasitic nematode genetically and morphologically similar to most helminths, and discusses progress toward implementation in off-grid toilets. Electroporation, the utilization of electric fields to porate biological material, increases cell membrane permeability in its conventional application. Herein it is used to open pores in nematode eggshells—the first report of such an application to the best knowledge of the authors. A parametric evaluation of electric field strength and treatment duration of eggs and worms in phosphate buffer solution and polished blackwater was performed using a 1-Hz pulse train with a 0.01% duty cycle. Pore formation was quantified using a fluorescent label, propidium iodide, that targets embryonic DNA. Post-treatment egg viability assays demonstrated that electroporation deactivated *C. elegans* eggs without supplementary methods (i.e., chlorination or oxidation). Following optimization, electroporation was ultimately applied to *Ascaris suum*, a helminth nematode. This research reveals that electroporation increases eggshell permeability through potential channel formation within the eggshell in both saline and blackwater media. Based on current observations, we discuss present treatment conditions and energy requirements for helminth destruction in wastewater.

COMSOL Simulation of Magnetoactive Elastomers to Inform Material Design and Optimization

Robert S. Feather & Joseph Paturzo (Dr. Benjamin Evans) Department of Physics

A magnetoactive elastomer (MAE) is a soft, flexible material infused with rigid micro- or nanoscale magnetic particles. Rather than having a rigid structure, MAE's can bend and twist in response to an applied magnetic field. These materials can be used to create a variety of useful devices such as magnetic valves or actuators, which can be manipulated remotely by a well-designed magnetic field. Currently, applications of MAEs are limited by the amount of torque which can be delivered by an applied magnetic field. However, we have developed a new type of material in which magnetic particles are assembled into elongated chains within the MAE matrix. Our preliminary experiments have shown that these materials are capable of producing torques as much as 60 times larger than in unchained materials.

In order to advance the development of MAE materials and devices, it is critical to develop a theoretical model which predicts their behavior. We have developed a preliminary analytical model to predict the response of these materials under a variety of conditions, including the degree of alignment of the particles within the material, the concentration of particles within the material, and the orientation and magnitude of the applied magnetic field. This model will be useful for the design of future devices. However, this model needs to be corroborated with experimental results and detailed computational simulations. To this end we have conducted physical experiments on MAE films to measure the torques, and we have developed a computational model using COMSOL to predict MAE behavior under the same set of conditions. Our COMSOL model is in good agreement with experimental results in key areas: it predicts an angular dependence (torque vs. applied field angle) and a concentration dependence (torque vs. magnetic particle concentration) similar to those observed in our experimental results. Future work will incorporate the effects of particle chaining into our model and simulation, ultimately leading to useful figures of merit to guide the design and implementation of high-torque MAEs.

Building an Optical Coherence Tomography Imaging System for Personalized Cancer Treatment

Matthew D. Foster (Dr. Richard Blackmon) Department of Physics

Early detection and treatment remain our best tool against cancer. One potential method of detecting cancer uses Optical Coherence Tomography (OCT), a minimally invasive technology that uses near-infrared light to create high-resolution images in biological tissue. My research works to develop a form of cancer detection and treatment that can be personalized to an individual. The OCT system is used to identify the cancerous cell in a tissue sample. Once this sample is identified, a therapeutic laser is used to heat and kill the cancerous cells. By using this targeting method to only eliminate the cancerous cells, the treatment is personalized to each individual. In previous work, I have built an OCT imaging system capable of taking cross-sectional images of breast and skin tissue. I have also created a user-friendly interface and software to control our OCT imaging machine so that it can be used by people with a limited understanding of computer software. In this work, I have combined my software into a master user interface capable of controlling all aspects of the system at once. In future work, I will

demonstrate the efficacy of the system by taking live images of biological samples and processing them in real-time. These images' will be used to further calibrate my current OCT imaging system.

On Demand Transdermal Drug Delivery

Matthew D. Foster, Michael J. Borucki, & Ryan Paxson (Dr. Jonathan Su) Department of Physics

Cigarette smoking causes almost one in every five deaths in the United States. Despite the negative health effects of cigarette smoking, smoking cessation is extremely difficult with many smokers reporting over thirty or more quit attempts before successful cessation. While the nicotine patch has proven to be an effective form of nicotine replacement therapy for some smokers, many smokers experience a high relapse rate. One reason for the failure of conventional transdermal nicotine delivery is the different modes of absorption of nicotine between a cigarette and current transdermal patches. When smoking, nicotine levels in the body rapidly increases in spikes with each cigarette smoked. In a conventional patch system, however, the dosage is delivered at a lower, constant rate, which does not replicate the profile of nicotine absorbed by the body when smoking either a cigarette or an electronic cigarette. Further, because transdermal delivery is steady, it is non-responsive to the urge to smoke. We have therefore developed a user-triggered transdermal patch capable of both replicating the nicotine spikes of a cigarette and responding to the urge to smoke. This has resulted in two prototype patches, which will be discussed in the presentation.

Comparing Methods of Mixing Excitation Mechanisms for Modeling Composite Galaxies

Connor K. Simpson (Dr. Chris Richardson) Department of Physics

A spectrum is like a fingerprint for each galaxy that determines what elements are inside based on the light it gives off. By analyzing different segments of these spectra, we can tell whether a galaxy is a star-forming galaxy or is an active galactic nucleus (AGN) galaxy with a supermassive black hole. There are other types of galaxies such as composite galaxies and LINERs (Low-Ionization Nuclear Emission-line Region), which are thought to be a mixture of star-forming galaxies and AGN. Modeling these “mixed” galaxies can be done using either a self-consistent or empirical methodology, but a robust comparison between the two methods has yet to be carried out. The goal of this research is to investigate the difference between the predictions of self-consistent and empirical methods of modeling galaxies with both star-forming and AGN contributions, which could change the classification of galaxies using diagnostic diagrams. To create empirical models, we first run a star-forming galaxy model and an AGN model separately and then combine the two in various proportions known as mixing fractions. For self-consistent models, we combine both star-forming and AGN activity into a single model with a given mixing fraction at the beginning of the simulation as opposed to after running the simulation. For our simulations, we vary four parameters: mixing fraction, hydrogen density, ionization level, and elemental abundance. Real data from over 130,000 galaxies were used from the Sloan Digital Sky Survey Data Release 13. For the diagrams that we analyzed, we found that varying the hydrogen density did not result in any meaningful difference in the mixing methodology. Varying the elemental abundances of the galaxies revealed larger changes, but

were still less than anything which would be statistically significant. The largest difference resulted from a mixing fraction of 16% at two times solar abundances, creating approximately a factor of two difference in the predictions from each mixing methodology. This difference is close to the LINER classification line on the diagnostic diagram, which implies that galaxies could be classified in two different ways depending on the adopted modeling scheme.

Exploring Flight Characteristics of Model Rockets

Justin D. Smoot (Dr. Sirena Hargrove-Leak) Department of Physics

Training in computer technology and understanding the incorporation of interactive technology are increasingly important skillsets for engineers. We have therefore taken advantage of the currently existing, open source Arduino miniature computing platform, and incorporated it into the model rocket design project component of EGR 123. The project includes traditional engineering graphics (hand drawings), computer-aided design using SolidWorks, an open-source model rocket simulator tool, 3D printing, and basic instruction in using Arduino. This project seeks to design, build, and test an Arduino-based altimeter to measure the affects of payload on apogee(altitude). A wind tunnel was built last semester to explore the altimeter affects on the rocket's flight characteristics. Code has been developed for the Arduino components to record data.

Political Science and Policy Studies

To Farm or Not to Farm: A Cross-Sectional Study of Tobacco Production Post-Federal Deregulation

Sarah Lord (Dr. Carrie Eaves) Department of Political Science and Policy Studies

In 2004, the Tobacco Transition Payment Program (TTPP) was introduced by the federal government with the intent of incentivizing tobacco farmers to be bought out of the tobacco industry through payment installments over the next ten years. In this study I examined Virginia, South Carolina, Georgia, and Tennessee because of their similar amount of tobacco production in 2002 and 2007, and then their subsequent divergence in production levels by 2012 with Tennessee and Virginia increasing production and South Carolina and Georgia experiencing a drop in productivity (USDA Census of Agriculture). Previous scholarly research has focused on quantitative farm factors such as farm size and type of ownership in farmers' decisions to exit or remain in a deregulated industry. Experts have also researched the effects of tobacco lobby and historical tobacco culture on tobacco use rates in major tobacco-producing states. This study seeks to reconcile those two bodies of research by combining statistical analysis of quantitative state farm factors and one qualitative interview with state farmers on the influence of tobacco culture in their decision to stay or exit the industry.

Preliminary results suggest that a higher percentage of state land dedicated to farming and the monetary campaign donations given by tobacco lobby in each state is related to a high level of production post-TTPP which supports the theory that state tobacco culture is influential in farmers decision to stay or exit. Further, interviews have suggested that states where tobacco has a long history and is widely respected, production was more likely to increase post-buyout.

Further analyses are in progress. Results of this project will provide evidence of the importance of production factors and state cultural environment for future federal programs. Buyouts could potentially come for industries whose products have been proven harmful like coal, or declining industries like textiles. Government policies modified according to the results of this study could have a higher success rate of assisting farmers out of the industry and promoting other, more sustainable, career paths.

Media Representations of Women Supreme Court Nominees

Victoria A. Bolger (Dr. Elisha Savchak-Trogdon) Department of Political Science and Policy Studies

“When there are nine.” This was Associate Justice Ruth Bader Ginsburg’s response to a question asking when there will be enough women on the U.S. Supreme Court. To date, however, there have only been four women justices, with three being the most serving at one time. Here, I seek to analyze and understand the ways in which the media depicts female nominees to the U.S. Supreme Court throughout the nomination and subsequent confirmation process. As nominees to one of our fundamental governmental institutions, it is important to understand whether media reports on potential female justices in similar ways as their male counterparts, or if they are subject to gender bias or negative coverage. This project focuses on the four females nominated and later confirmed to the U.S. Supreme Court to date – Sandra Day O’Connor, Ruth Bader Ginsburg, Sonia Sotomayor, and Elena Kagan. The United States has a particular history involving sexism in the political sphere and studies suggest that women vying for office in the other branches of government have faced scrutiny based on their gender. I argue that because of this implicit bias and demonstrated explicit sexism, these four women will be portrayed in a more negative light. I will collect and perform a content analysis on news articles from three prominent news sources, including The Washington Post (liberal), The Associated Press (moderate), and The Wall Street Journal (conservative). These articles follow a discrete timeline following the date of each nominee’s nomination up until her confirmation date as a justice. I expect that each news source will highlight different aspect of the nominee’s attributes, so that the liberal leaning will emphasize her potential role as a female serving on the Court, the moderate source will focus on her experience and merits to the Court, and the conservative source will focus on the personal lives of the female nominees.

The Role of State Legislatures’ Partisan Makeup in Determining Healthcare Funding for Prisoners

Jacob P. Hayward (Dr. Susan Camilleri) Department of Political Science and Policy Studies

The costs of providing healthcare to the incarcerated have been increasing rapidly across the United States with some consistency, while financial resources have remained scarce (Henrichson & Delaney, 2017). While research has identified numerous factors to explain this increase, none of these factors can explain the large variability present in budgeting for correctional healthcare among the states. The size of correctional healthcare budgets adopted by states impacts the mental and physical wellbeing of over one million incarcerated Americans by determining the quantity and quality of health services available to them (Delgado & Humm-Delgado, 2009). Thus, large inequalities exist in the medical treatment of prisoners among the

states. This study proposes that the partisanship of state legislatures affects the amount of funds allocated for correctional healthcare in that state. Democratic control of state legislatures is expected to be associated with increased funding for healthcare services within the state correctional system due to differences in partisan views towards the incarcerated and towards healthcare, with Democrats favoring expansion of government sponsored healthcare and deinstitutionalization of the corrections system (Ellwood & Guetzkow, 2009). Using data from the most recent fiscal year, a cross-sectional regression analysis will be conducted to determine whether the proportion of Democrats within the state legislature is associated with funding for prisoner healthcare. State population size, partisan control of a state's executive office, economic status, and racial demographics will be considered as alternative explanations for any observed relationship, and controlled for in the analysis. The results will be analyzed and interpreted to increase policy actors' understanding of the causes and consequences of correctional healthcare budgeting decisions and to inform future research into this growing area of healthcare inequality in America.

US Intervention in Pakistan: Political Moves that Shaped Pakistan's Religious History

Erin T. Jenkins (Dr. Jason Kirk) Department of Political Science and Policy Studies

I will be one of two student respondents to the symposium. In this response, I will introduce my research project on US-Pakistan relations in the Obama era that I am just beginning this semester and then pose a few questions about South Asia or research on South Asian topics to the presenters based on the early insights I have gained from my preliminary investigations. My project will examine the state of religious tensions in Pakistan by examining US policies under the Obama administration in order to explain the current relationship between the two nations. Pakistan's history involving treatment of religious minorities has dominated politics in the nation since its founding. Pakistan has been a strategic ally of the US for decades; however, relations have often been strained due to the conflicting cultural and political ideologies of the two nations as well as a substantial lack of mutual trust. Scholars have investigated the state of religious tensions in Pakistan as well as the impact of US intervention, but there is limited work that attempts to draw direct connections between the two. I seek to fill the gap in the literature using process tracing (a method that works backwards from an outcome to find the contributing factors) and supplementary interviews to uncover how the current state of US-Pakistan relations was influenced by Obama-era policies that disregarded the oppression of religious minorities in Pakistan. With respect to the research my senior colleagues are presenting, my work prompts me to consider the potential implications of US policies on other countries in the South Asian region and encourages me to wonder how other religious minority groups in their research areas have been similarly (or dissimilarly) impacted by US actions.

Where are the Women? An Intersectional Analysis of Female Representation in State Legislatures

Mary E. Kempf (Dr. Carrie Eaves) Department of Political Science and Policy Studies

Although women are over half of the U.S. population, they make up less than a third of state legislatures. Women of color are especially underrepresented in state politics (Ziegler 2019). My research builds on previous studies by applying an intersectional lens that accounts for the

unique experiences of women of color. Since women of color are a multifaceted group with differing political contexts, I study the experiences of Black women specifically within this group. Using data from the National Conference of State Legislatures and the U.S. Census Bureau, I examine the effects of party control, political culture, and other state-level characteristics on the percentage of women in state legislatures in 2009, 2013, and 2017. In my analyses, I explore what factors are associated with increased representation for women of color and black women, in particular. The results of this quantitative analysis indicate that there are more women represented in the lower chambers of state legislatures, in states with term limits on service in the state legislature, and in legislative chambers that resemble the compensation and time commitment of a part time job. Additionally, many state demographic variables such as state population, urban population, and the percentage of adults with college degrees were found to predict more women in the legislature. Based on the results of the quantitative analyses, I conducted six interviews with female legislators to examine the experiences of diverse women in state legislatures as well as allowing the research to account for variables beyond numerical analysis. A recurring theme in these conversations was the importance of political ambition and family support. Additionally, I found that women of color and Black women face unique barriers to seeking office, unaccounted for in existing research. My research confirms the importance of updating current scholarship with methodologies that account for the unique experiences of women of color.

RT Online Coverage of US Election 2016: Analyzing Strategic Narratives

Noah T. Kutner & Kaitlyn O'Donnell (Dr. Laura Roselle) Department of Political Science and Policy Studies

While various investigations have confirmed the Russian's intent to interfere in the 2016 U.S. Presidential election, the extent of their efforts has yet to be fully determined. This paper analyzes the media coverage of U.S. events in the RSS feed of RT - Russia's state-funded English media network. This analysis focuses on demoralizing news, which includes stories that delegitimize or undermine American political institutions and businesses. This analysis will be completed through a cross-sectional, qualitative study of articles written on the United States by RT that have been sampled from April, October, and November of 2016. Over 60 topic categories will be tracked in RT's US articles to assess the topics that RT wished to bring to the attention of its audience in regards to the United States. The initial findings suggest that RT did use stories that were framed to undermine faith in US institutions during the election.

Political Polarization and Reddit

Joseph L. Rodri (Dr. Jason Husser) Department of Political Science and Policy Studies

A concern of the modern political climate is a perceived increase in polarization between political parties. When accompanied by the rise in popularity of the internet as a form of interaction, a question of a possible causal relationship between the two is raised. This project analyzes factors contributing to polarization in online communities devoted to political discussion. This is done by assessing the political polarization of popular subreddit r/The_Donald, an online exclusively pro-president Trump discussion forum. This is done firstly through a content analysis looking at civility and partisan polarization in the comment threads of

various posts, analyzing which common elements contribute to incivility and anger as the discussion progresses. This is also done to find correlations between polarization or incivility and various measures such as topic, popularity, and date. By finding common variables in these groups, it is possible to find conditions that produce productive political discussion online. Additionally, a survey is to be sent out gauging the polarization of reddit users, with a particular focus on r/The_Donald participants. This will also assess polarization in relation to usage of the subreddit, as well as finding common factors that contribute to heightened polarization. This project has implications for the development of productive discussion-based online platforms and understanding the role that discussion sites such as r/The_Donald play in the modern political climate. This project is a multi-year project, early findings show a slight tendency for incivility to decrease with the number of upvotes, while polarization seems to stay fairly consistent with post popularity. While this project is still underway, these results have implications for the impact of high viewership on specific posts affecting the overall character of that thread, as well as the impact of certain topics on driving polarization and incivility.

Coverage of Hillary Clinton in RT during the 2016 Election

Annie Waddell & Louisa M. Sholar (Dr. Laura Roselle) Department of Political Science and Policy Studies

Russia Today (RT) serves as a media outlet towards English-speaking audiences. Its direct oversight by the Russian government has called into question its involvement in the 2016 presidential election in the United States, particularly in its coverage of Democratic candidate Hillary Rodham Clinton (HRC) and other contentious topics. Understanding the patterns and references made to HRC illuminate the constructed narratives involving major strategic themes of distraction, division, and demoralization intended for Western audiences' consumption. The initial findings suggest that RT content disproportionately covered HRC and her alleged email scandal during peak moments in the election season. In order to examine the progression of this emerging trend, we will be completing a cross-sectional, qualitative study of articles written about the United States by RT during the first weeks in April, October, and November of 2016. The initial findings suggest that coverage of HRC was a part of a framed narrative to undermine faith in U.S. institutions during the election.

Gender Bias in the portrayal of Female Supreme Court Justices in Print Media

Sarah V. Winkelstein (Dr. Elisha Savchak-Trogdon) Department of Political Science and Policy Studies

As more females are elevated to the U.S. Supreme Court, it has become imperative to study how the media portrays female justices. The U.S. Supreme Court is the final arbiter of any constitutional issue, and the American public gets their news about the Court's members and their cases through mass media. Understanding how the media portrays these female justices is essential in understanding the Court as a whole and its consequences for the American people. While research on the media's portrayal of famous women as well as women in general exists, there is a significant gap in scholarship addressing depictions of female justices. Here, I examine print media's portrayal of female justices by performing a content analysis of one major news source - the New York Times. I will evaluate its portrayal of all four female justices over time

from Sandra Day O'Connor's confirmation in 1981 to the present day. The portrayal of each justice will be studied starting at her confirmation and the first full year that follows, and then every three years until the end of her time on the court or until present day. This research expands our understanding of females confirmed to the Court because it elucidates potential biases shown to the public by a commonly-consumed media source. Based on previous findings about how women are portrayed in the news, I expect to find that ideas and roles that are traditionally associated with females will decrease in mention over time and the focus on the justices will shift to emphasize their career and experience on the court in the majority of coverage. Despite this, I still expect to find that common stereotypical language will be pervasive in the coverage of these females throughout the entire time period studied.

Psychology

“Even over the Rainbow, They’ll still Call Me n*SS@#”: Exploring the Intersectional Identities of Emerging Adult Black Gay Men

Bridgette Agbozo & Tres M. McMichael (Dr. Buffie Longmire-Avital) Department of Psychology

Black gay men, specifically those in majority White spaces, must manage both homophobia and racism in society. Previous studies (Hunter, 2010; Walker; Walker & Longmire-Avital, 2018) have used an additive conceptual framework to understand the intersection of these multiple identities. However, Bowleg (2008) challenges whether or not this framing approach adequately captures the intersectional integrations of the concurrent experiences of race, gender, and sexuality. As Black gay men navigate through the world, it still remains unclear how these experiences and elements of self-identity developed and how this relates to partner seeking behaviors. The primary aim of the current study was to explore how emerging adult Black gay men constructed their identity and whether or not conceptions of identity were related to perception of partner availability (PPA). The secondary aim of the study was to assess how PPA related to experiences with intersectional discrimination. Forty-two men who self-identified as Black, gay, and between the ages of 18 – 24 ($M_{\text{age}} = 20.6$) participated in an anonymous mixed data online questionnaire (with qualitative and quantitative questions) titled, “Project Triple B: My Baes, Buddies, and Booty-Calls.” Primary findings indicate that the majority (60%) identified as a Black gay man as opposed to a Black man who is gay (33.3%) or a gay man who is Black (6.7%). Many respondents (28.8%) highlighted the “equal weight and importance” that both their racial and sexual identities hold for them. Secondary findings highlight a relationship between experiences of discrimination and perception of partner availability, in such, those reporting greater amounts of everyday discrimination ($r=.39$), engaging in more frequent hypervigilance ($r=.32$), and perceiving the public’s low regard ($r=-.36$) for Black gay men concurrently reported limited casual PPA. These results echo Bowleg’s (2008) position that an intersectional framework is essential in effectively understanding the lived experience of LGBT persons of color.

Construction of an Assessment Center for Entry-Level Professionals

Betsy H. Albritton (Dr. Chris Leupold) Department of Psychology

Numerous leadership development programs across universities invest considerable resources to introduce their students to key concepts and practices related to leadership and professionalism (i.e., managing conflict, analyzing issues, influencing others, etc.). However, a standardized system to assess and develop students' demonstrable abilities in the actual work-related competencies that employers expect of a high-performing entry-level professional is sorely lacking. Building upon the performance standards associated with the eight competencies for entry-level employees developed by the National Association of Colleges and Employers (NACE), this project entails the creation and delivery of a set of integrated behaviorally-based simulations to assess students' levels of competence in these key areas. Based on insights from subject matter expert interviews about the relative importance of the NACE competency model and specific performance standards and behavioral examples that reflected them; assessment center components were created. These included the standardized scenarios and scoring guides for a behaviorally-based interview, in-basket activity, and a simulated face-to-face meeting with a superior. Such a system, referred to as an assessment center, is a widely used tool in Fortune 500 countries for employee selection and development purposes. The assessment center was designed based on industry and psychometric best practices and methodologies, including validation of components. Through an iteration of pilot administrations, the assessment center was further refined to achieve psychological validity in a university setting. A description of the steps involved in creating the assessment center will be provided, as well as how it can serve as a tool to help students better understand employer expectations and help prepare them for success as they begin their careers. Future applications and next steps for research are also discussed.

Age Differences in Autobiographical Memory

Laura E. Bernstein (Dr. Amy Overman) Department of Psychology

Autobiographical memories (AM), are the vivid memories individuals have about events from their lifetime. The self-enhancement function of AM is the use of memories to contribute to an enhanced view of oneself, and has been operationalized as rating positive memories as psychologically closer to oneself than negative memories. Older adults recall more positive than negative AMs (Kennedy, Mather, & Carstensen, 2004), and optimistic older adults are more likely to self-enhance through means other than memory (Bailis, Chipperfield, & Perry, 2008). To date, older adults have not been found to use AM for self-enhancement more than young adults (Demiray & Janssen, 2015). In the present study, we investigated whether optimism is associated with the self-enhancement function of AM in older and younger adults, and whether self-enhancement in AM is associated with older and younger adults' rating for self-relevant words. We conducted an experiment with 64 younger and 60 older adults in which participants were asked to provide both positive and negative AMs and rate those memories in terms of psychological distance. Participants also completed an optimism scale, a depression scale, and rated the self-relevance of positive and negative words. Age groups did not differ in self-enhancement, which is consistent with prior findings but self-enhancement in autobiographical memory was predicted by depression across age groups ($p = .034$). Older adults had higher optimism ($p < .001$) and lower depression ($p < .001$) than younger adults and were more likely than younger adults to rate positive words as self-relevant ($p < .001$) and negative words as not self-relevant ($p < .001$), which may indicate that self-enhancement is occurring. Younger adults tended to use more affective ($p = .001$) and past-focused words ($p = .004$) than older adults when describing their positive memories. Older adults tended to use more words about family ($p <$

.001) and death ($p = .001$) than younger adults in their negative memories. Our study found important age differences in the qualities of autobiographical memories which provide insight into the way in which individuals at different stages of their life frame past events.

What Would You Do? Predicting Recommendation of Resources in a Hypothetical Sexual Assault Situation

KellyAnn Bonanno (Dr. CJ Fleming) Department of Psychology

At least 20% of college women experience unwanted sexual experiences (Lawyer et al., 2010) and a substantial amount of survivors turn to friends instead of formal resources, such as counselors and Title IX coordinators, for help (Ogletree, 1993). Given this pattern, it is important to understand how friends think about and recommend available resources. Thus, the present study sought to better understand the factors that predict the number of sources individuals would recommend to their peers when hypothetically disclosed to about sexual assault. The sample consisted of 166 individuals who had no prior experience with resources for sexual assault on campus, who were recruited through email and on-campus advertisements. Participants aged 18 to 22 (71.7% Female, 87.3% Caucasian) responded to an anonymous online survey, and answered questions regarding their beliefs about seeking help for a problem related to unwanted sexual experiences, level of acceptance of stereotyped beliefs about sexual assaults (rape myth acceptance), attitudes towards seeking professional help, their response after being told about a hypothetical sexual assault, and their awareness and perceived helpfulness of campus resources. A multiple regression analysis was used to examine the relationship between personal beliefs and the number of resources recommended to an individual. Results showed that increased awareness of resources and increased perceived helpfulness of resources were each related to the total number of resources an individual recommended to a hypothetical peer. Interestingly, the perception that seeking professional help would be acceptable for a peer was related to lower numbers of recommended resources, possibly due to more targeted recommendations that the peer seek professional help. Understanding the variables that increase the number and type of recommendations given to a peer who experienced sexual assault is a vital first step in raising the survivor's awareness of resources and hopefully optimizing the likelihood of seeking help.

Perceptions of Gender Role Violation in Transgender Individuals: How are Violations Defined?

Sarah L. Branchfield (Dr. David Buck) Department of Psychology

Research indicates that transprejudice is associated with traditional gender role endorsement, need for cognitive closure (a desire for things to be unambiguous), and essentialist beliefs about gender (belief that gender has a biological basis). However, the exact nature of these relationships is unclear. For example, it could be that transgender people are viewed as violating gender roles simply by identifying with a gender that does not correspond to their assigned sex, or it could be nonconforming gender expressive behaviors elicit negative evaluations. This study examined the relationships between transprejudice and the above-mentioned individual difference variables using Amazon's Mechanical Turk (M-Turk). Cisgender participants ($N = 327$; 50.5% male; $M_{\text{age}} = 38.66$, $SD = 12.39$) evaluated a hypothetical target individual whose

identified gender (Male or Female), gendered behavior (Masculine or Feminine), and transgender status (Cisgender or Transgender) were manipulated. A 2 (target gender) \times 2 (transgender status) \times 2 (gendered behavior) ANOVA predicting attitudes towards the target showed only a main effect of transgender status, with cisgender targets being rated more positively than transgender targets. The three individual difference variables each showed different patterns of relationships with attitudes toward the targets. The relationship between gender role endorsement and attitudes was moderated only by the transgender status of the target, such that it significantly predicted more negative attitudes toward the transgender target but not the cisgender target. The relationship between essentialist beliefs about gender and attitudes was moderated by both the transgender status of the target and by the presence of gender incongruent behavior. There was no direct relationship between need for closure and attitudes, but a three-way interaction approached significance, suggesting that those high in need for closure have more negative attitudes towards transgender individuals only when their behavior does not align with their gender identity. These data suggest that negative attitudes towards transgender people may arise for different reasons, and that prejudice reduction interventions may benefit from attention to the related individual difference variables.

The Feminine and the Freaks: Gender and Mental Health Status Linguistic Frames Differentially Impact Perceptions of a Hypothetical Individual

Jessica K. Burchett (Dr. L. Kimberly Epting) Department of Psychology

Words carry linguistic frames – mental constructs and associates that are evoked when words are used or heard (Hallahan, 1999; Lakoff, 2004). As such, frames can construct and maintain stereotypes and differential behavior toward individuals on the basis of constructs like gender or mental health status, for example (Broverman, et al., 1970; Coverdale, et al., 2002; Crawford, et al., 2004; Maurya & Dixit, 2008). This study examined how combining linguistic frames relating to gender or mental health status affected perceptions of a hypothetical individual, identified by initials. Recruited via Amazon Mechanical Turk, 438 participants viewed one of four brief lists of 8 descriptors established via pilot research (2 gender frames, 2 mental health status frames, 4 control frames) that framed the hypothetical individual as feminine/mentally ill, feminine/mentally healthy, masculine/mentally ill, or masculine/mentally healthy. Participants' perceptions were measured on 9-point scales in response to 10 questions (e.g. How much do you like [initials]? How likely do you think it is that [initials] has a diagnosable mental illness? How likely would you be to hire [initials] if you were an employer? How responsible do you think [initials] is?). Two items—perceived gender and diagnosable mental illness—confirmed that the linguistic frames successfully produced perceptions of the intended gender and mental health status. Results then indicated main effects of mental health status frame on most dependent variables, including likability, trustworthiness, responsibility, and employability. In each case, those framed as mentally healthy received more desirable scores (i.e. more likeable, trustworthy, etc.). Gender framing only had a statistically significant main effect on items related to likability, such that those framed as feminine were perceived as more likable. There were no interaction effects between gender frame and mental health status frame. As such, the relative independence of the gender and mental health status frames suggests the possibility that stronger biases toward women with mental illness may be weakening. However, subsequent research may examine more detailed effects of frames that simultaneously invoke perceptions of both gender and mental health status.

The Effect of Linguistic Framing of Feminism on Reader Reaction to News Headlines

Madeline G. Davis (Dr. L. Kimberly Epting) Department of Psychology

Palatability of an idea or concept can be altered by linguistic framing, or the associative context of a word, phrase, or idea (Lakoff, 2004). Thus, framing can change behavior (Schindler & Pfattheicher, 2017; Zolner et al., 2010). By manipulating the surroundings of the word or phrase in the context of a news headline, the perspective of the headline can be altered, which can ultimately lead to changes in reader behavior, such as clicking the headline and sharing it with others. There is little research investigating the effects of linguistic framing in news headlines and reader reaction. This project studied the effects of two linguistic frame types in headlines about feminism. Representation framing alters the degree of interpretation by the writer of the content (vs. the producer of content); narrative representation involves full interpretation of the content and direct representation involves no writer interpretation. Valence framing is the use of perceived “good”, “bad”, or neutral words. Participants were presented with six fictional headlines about feminism, one with each combination of the types of framing. They were asked to report their likelihood of clicking on the headline, likelihood of forwarding the headline, and emotional stimulation. Additionally, participants reported their frequency of clicking on similar headlines, how interesting the headline was, and how interested they were in the topic of the headline (six total dependent measures). Reader reaction to the fictional headlines was sensitive to both the representation frames and the valence frames. Direct representation framing outperformed narrative representation framing across all six dependent measures. Headlines that had positive valence frames outperformed negative and neutral frames in terms of likelihood of clicking on the headline, forwarding the headline, reported frequency of clicking on similar headlines, and interest in the topic of the headline. However, significant interactions between representation and valence framing were also found. Results of this project demonstrate ways to garner more engagement with feminist issues in the news through the use of linguistic frames.

Fine-Tuning Focus: Exploring Electrophysiological and Attentional Responses to tDCS

Kylie J. Donahue (Dr. Rachel Force) Department of Psychology

Transcranial direct current stimulation (tDCS) is a means by which localized electrical alteration of cortical circuits can be accomplished (Gandiga et al., 2006). tDCS promotes excitation or inhibition of postsynaptic neurons depending on the position of electrodes, ultimately enhancing or inhibiting a desired behavior (Coombes, 2009). The present study explored how tDCS may produce behavioral and neurophysiological changes within the brain while completing an attentional training task. It was hypothesized that stimulation to the left dorsolateral prefrontal cortex through anodal tDCS would increase one’s selective and divided attention abilities while producing a change in event related potential (ERP) components. Subjects participated in brain training assessments over the course of nine days, in which baseline attentional abilities were measured via the Eriksen Flanker Task on the first, fifth, and ninth day. Reaction time and accuracy on the Eriksen Flanker were recorded as well as neural electrophysiology using an electroencephalogram (EEG). Following Eriksen Flanker, some participants were stimulated with tDCS twice for 20 minutes at 2 milliamps-- on day one and day five of the study-- while completing attention training exercises through BrainHQ. There was no significant difference in degree of performance increase from day one to day nine between the stimulated and control

groups for the BrainHQ tasks, nor was there a significant difference between conditions for the accuracy of Eriksen Flanker. However, there was a decrease in average reaction time for individuals who did not receive tDCS stimulation compared to individuals who were stimulated ($p=0.071$). Statistical analysis of the Cz electrode channel demonstrated a significant main effect of time for the peak voltage ($p=0.017$) and area under the curve ($p=0.013$) of the N1 component, as well as a significant interaction between time and stimulation for the peak voltage of the P1 component ($p=0.006$). These results indicate that minute changes to both behavior and neural electrophysiology may result from neuromodulation. The sample size and duration of the study serve as limitations for the present research, therefore further studies must be conducted to determine the true effects of tDCS on attentional training.

She Does Not Want Me to Be Like Her: Eating Pathology Risk in Black Collegiate Women and the Role of Maternal Communication

Jennifer L. Finkelstein (Dr. Buffie Longmire-Avital) Department of Psychology

As of its 2018 update, The National Eating Disorders Association notes that for people of color (PoC), there are no exact numbers on the prevalence of eating disorders. This stems from a historical bias that eating disorder symptomatology only affects wealthy, white, adolescent girls (Mulholland & Mintz, 2001; Williams, 1995). This problematic idea has led to a society of silencing and lack of understanding surrounding the cause and prevalence of disordered eating in PoC populations. Communication is both a powerful mediator and moderator for health outcomes. Particularly for Black women, correlations between parental communication and body image were larger than in white women (Bardone-Cone, Harney, & Sayen, 2011). As seen in past studies, a mother's own self-talk about her body also contributes to higher levels of depression (Bauer, Bucchianeri, & Neumark-Sztainer, 2011). Mothers act as an agent of socialization around eating and race, meaning they directly impact the way their daughters think about their own and other's weight. Previous research has not addressed how a Black body image aesthetic and maternal communication about body size relates to eating pathology. This current study aims to understand how a mother's beliefs around body size/shape, eating disorders, and responses to racism influences the likelihood of her daughter's experience with eating pathology. One-hundred and forty-three Black African American collegiate women between the ages of 18-23 participated in an online mixed data survey with both Likert scale and open-ended questions. Participants were recruited through various online social networking platforms. Using a grounded theory approach with iterative coding we found that many of the women described conversations with their mothers about their bodies to include negative critiques and warnings to avoid gaining weight. Although most mothers did not have direct conversations with their daughters about eating disorders they were actively engaging in discussions about health, practicing portion control, and body acceptance. Despite 33% ($n = 40$) of participants meeting clinical criteria for eating pathology, only one participant had received treatment. These findings further illustrate the importance of including Black women in eating pathology research.

Changes in Sustained Interaction in Infant-Mother Dyads across Locomotor Development

Alexandra N. Grillo (Dr. Sabrina L. Thurman) Department of Psychology

Gains in self-regulation and parent involvement during play can help infants attend to objects for longer periods of time (Yu & Smith, 2016). But, the acquisition of new postures and forms of locomotion can impact how infants interact with their environment. Here, we assessed whether sustained interaction changed over time for mothers and infants, as the infants acquired locomotion. During bi-weekly sessions from 6 to 17 months, we observed 13 mother-infant dyads during 10 minutes of free play in a laboratory setting. Objects meant to elicit interaction were placed around the room. Infants' postural-locomotor abilities were assessed at each session to identify crawling and walking onsets. We video-coded infants' and mothers' targets of interaction at 15-second intervals and then analyzed how many consecutive intervals were spent with the same target as before. We analyzed two 10-session transition periods centered around hands-and-knees crawling and walking onsets, respectively, tracking changes in the length of bouts of interaction over time. During the transition to crawling, the overall number of interaction bouts produced by the dyad significantly increased ($p < .0001$), and was greater for mothers than infants ($p < .0001$). As infants acquired walking, this number remained high but did not significantly change over time (ns), and was similar across the mother and infant (ns). Over the transition to crawling, infants' average interaction bout length was longer than their mothers' ($p < .0001$), but this decreased over time ($p < .003$). The average interaction bout length remained the same through the transition to walking (ns), and infants' interaction bouts continued to last longer than their mothers' ($p < .0001$). But, correlations ran on individual dyads revealed that the majority of infants' and mothers' average interaction bout lengths were not significantly correlated. Thus, with the acquisition of crawling, infants' bouts of interaction became shorter and greater in number over time. Although both members of the dyad remained interactive during free play, infants' interactions endured longer than their mothers', and seemed unrelated to her patterns of interaction. These early trends in mother-infant play could influence cognitive skills such as self-regulation of attention.

Contributions to the Success of Low-Income College Students: Internal and Institutional Characteristics

Megan E. Herdt (Dr. Katie King) Department of Psychology

Low-income (LI) college students face unique challenges in their transitions to college and throughout their college experience. The difficulties of learning to navigate unfamiliar environments are exacerbated by LI students' experiences of marginalization and encounters with colleges' discourses about the perceived deficits of financially and ethnically minoritized students (Linley, 2018; McKay & Devlin, 2016; Pyne & Means, 2013). While many LI students are highly resilient and possess coping strategies, the cumulative experience of these challenges can put them under additional stress, detract from their sense of belonging, and reduce their psychological wellbeing, all of which diminish the likelihood of graduating from college (Linley, 2018; Strayhorn, 2012; Swanbrow Becker et al., 2017). This study explored the strengths and strategies that LI students use to navigate through their institutions and generated recommendations for improved institutional supports. Ten LI college students of diverse ethnic backgrounds were included in this study. Participants were first-generation and continuing-generation students who varied by gender, religiosity, sexuality, grade, and scholarship cohort membership. Two rounds of interviews were conducted with each participant. Traditional interviews explored transitions to college and current college experiences. Walking interviews explored the importance of three campus locations chosen by participants, investigating places'

impacts on belonging and development. Transcribed interviews were qualitatively coded and analyzed using grounded theory. Findings include strategies for adaptation and success that participants implemented to navigate through their institution, enhance their sense of belonging, and foster their psychological wellbeing and development. These strategies include establishing mentoring relationships, engaging in self-management, strategically using place, and becoming a social justice advocate. Findings also include recommendations for the construction of institutional bridges between university structures and the characteristics of its LI students to better foster the unique strengths of those students, increase their sense of belonging, and enhance their psychological wellbeing. While LI students' strategies and available structures vary across colleges, conditions contributing to gaps between the strengths of LI students and qualities of institutional offerings remain similar. This study can be used to inform the development of institutional bridges based on the strengths, not perceived deficits, of LI students.

Grapheme-Color Synesthesia and Word Search Performance

Johanna M. Hilpuesch (Dr. Mathew H. Gendle) Department of Psychology

Grapheme-color synesthesia is a perceptual experience in which individuals simultaneously experience a sensation of a specific color (the concurrent) in conjunction with viewing or thinking about an objectively achromatic number, letter, or word. (the inducer; Simner, et al., 2006). While some researchers support the claim that colors are central to the way some synesthetes experience language (Weiss, et al., 2018), little research has addressed the impacts of synesthesia on everyday experiences and elementary tasks. This study compared the performance of grapheme-color synesthetes to similar matched non-synesthete controls on two word search tasks. If grapheme-color synesthetic experience arises early in the perceptual stream (before conscious recognition of a grapheme), grapheme-color synesthetes may demonstrate a performance advantage on achromatic word search tasks, as the perceptual experience of a colored grapheme may produce an advantage in more readily finding that letter among others, and thus finding the desired word. If, however, an inducing grapheme must be selectively attended to and recognized before the color concurrent can be experienced, synesthetes should not demonstrate a performance advantage on such search tasks. After first verifying the presence of grapheme-color synesthesia using the Synesthesia Battery (Eagleman, et al., 2007), synesthetes ($n = 6$) completed two distinct word search puzzles, and their performance was compared (using a Wilcoxon Rank Sum Test) to matched control participants ($n = 3$). Results showed no significant difference between the synesthetes and non-synesthetes in regards to time to complete each of the two word searches (in seconds; all $Z < -0.65$, all p 's > 0.51). While no significant difference was found between the groups, the results are noteworthy as they inform the ongoing debate regarding whether or not grapheme-color synesthetic experiences require the selective attention on the inducer (Brogaard, et al., 2016). Since our results found that the synesthetes did not have improved performance on the word search tasks, they support the hypothesis that grapheme-color associations do in fact require selective attention to graphemes in order to be generated.

Examining the Range of Autobiographical Memory and the Relationship to Associative Memory

Elana D. Kaplan (Dr. Amy Overman) Department of Psychology

Memories form our identities and shape daily interactions, so understanding their mechanisms is essential. Both associative memory and autobiographical memory (AM) require forming links between information. Thus, it is possible that general AM performance is correlated with associative memory performance. Studies on this topic are scarce (e.g., Leport et al., 2012), have not used the full range of AM assessments available, and have focused on highly superior AM (HSAM). Previously, HSAM has been presented as a binary phenomenon; however, it is possible for individuals to score within a range on screening materials. This study aimed to examine the spectrum of AM that may exist and its relationship to associative memory. Three previously developed AM questionnaires typically used as screening tools for HSAM detection (UC Irvine) were used. The Public Events Quiz served as an objective measure of AM. The 10 Dates Quiz (10DQ) collected personal AM details. The Autobiographical Memory Questionnaire (AMQ) collected general memory ability and AM ability information. PsyToolkit experiment software was used to administer a face-scene association task. We found a range of AM scores, which has interesting implications for understanding the spectrum of AM. There were three significant relationships, all involving the AMQ. Positive correlations were found between AMQ rumination scores (returning to old memories repeatedly) and 10DQ scores ($p < .001$, $R = .586$), AMQ indication of memory breadth and ability to discriminate between old and new information during the association task ($p = .039$, $R = .416$), and AMQ indication of memory breadth and proportion correct on the association task ($p = .041$, $R = .412$). These results indicate that there is a relationship between associative abilities and AM, predicted by results from the AMQ. We are the first to attempt an investigation of AM in a broad range of ages (from 24 to 75) for 85 participants. Additionally, we are the first to find a correlation between associative memory and AM that is not limited to only HSAM. These findings about AM have the potential to help in the development of techniques that reduce the associative deficit connected to aging.

How Do Gains in Locomotor Experiences Over Time Affect Infants' Naturalistic Exploratory Behaviors?

Nicole A. Karabas & Elena M. Cheek (Dr. Sabrina L. Thurman) Department of Psychology

Spontaneous locomotion allows infants to discover, explore, and focus interactions with their environments (Gibson, 1988). But, specifically how does experience in crawling and walking affect infant's spatial displacement rhythms and interactive behaviors during naturalistic play? We investigated patterns in these two exploratory behaviors, examining moments within sessions and over time. We tracked 13 infants longitudinally from 6 to 17 months of age. Infants participated in biweekly free play sessions, held in a laboratory playroom equipped with a variety of objects to elicit exploration. We video-recorded each session and completed exploratory behavior coding offline using 15-second intervals. First, we coded infants' displacement based on spatial coordinates on the floor. Second, we coded infants' interactive behaviors with objects, which included passive (e.g., holding), fine (e.g., spinning), gross (e.g., throwing), and no interaction. Across intervals, we determined whether infants demonstrated spatial displacement to a new location (i.e., traveling), or remained in the same location (i.e., not traveling), and recorded concomitant interactive behaviors. Preliminary analyses aimed to identify changes as infants gained crawling and walking experience over about 5 months. As novice crawlers, infants spent more time not traveling compared to traveling, but this trend reversed with gains in locomotor experience ($ps < .0001$). The number of bouts of no travel across intervals remained the same (ns), but, the average length of those rest bouts gradually

became shorter with gains in locomotor experience ($p < .007$). These rhythms seemed related to their interactive behaviors. Novice crawlers engaged in interactive behaviors at similar rates when traveling (ns). When novice crawlers paused traveling and remained in the same location, they predominantly engaged in fine motor interactions with objects ($p < 0.001$). As infants accumulated crawling and walking experience over time, they tended to show more passive and gross motor interactions with objects while traveling (both $ps < 0.001$), but more passive and fine motor interactions while not traveling (both $ps < 0.001$). Thus, both increased locomotor experience and decisions to travel or remain in the same location influence how infants interact with objects in their environments, which could affect opportunities for learning.

Current and Goal Self in Past and Present Anorexia Nervosa

Abigail C. Knowles (Dr. Bilal Ghandour) Department of Psychology

This study examines how women with past or present anorexia value perfectionism according to their current or goal view of self. Previous research has found that individuals suffering from *anorexia nervosa* have a particular concern for order, precision and symmetry and we aim, in this study, to probe deeper into the elements of the perfectionist personality that are most amenable to change (Srinivasagam et al., 1995). Twelve women, 18-21 years of age, with present or past anorexia were recruited through Elon University's online research system. Using Q sort, a methodology that centers individual viewpoints, the participants were asked to rank-order statements that were reflective of various aspects of perfectionism (i.e. desiring consistency in their daily life or their desire for spontaneity). The participants ordered the 62 statements twice; once in accordance with their current mentality and once according to their goal or aspirational mentality. Two distinctive factors emerged that were significantly split along present or future perspectives of self. When ranking based on their current self, all 12 participants had a *Perfectionist* viewpoint, which we labeled as Factor A. This factor only emerged when the women sorted statements according to their current view of self not their goal self, thus indicating that women with past or present history of anorexia intend to maintain perfectionism in the future. When participants were asked to sort the statements according to their goal self, all 12 participants loaded on to Factor B, the *Flexible and Fallible* factor which, when analyzed more specifically, indicates that some aspects of perfectionism are more malleable to change than others. Most significantly was the need to change the ruminative, fearful of mistakes and obsessive elements (i.e. all the mental aspects of perfectionism). Constructs such as routine, predictability and planning were valued as long-term aspects of perfectionism and constituted an essential future component of self. These findings have important implications for treating anorexia. Specifically, it gives clinicians a practical tool for a more targeted therapeutic approach to changing perfectionist traits with past or present anorectic women, while remaining aware of which aspects will be most resistant to change.

Building Social Identity Through Consumer Values – A Social Network

Ryan P. McElhinney (Dr. Erika Lopina) Department of Psychology

My project aims to address how people can use a social platform to build a new aspect of their social identity— one made of consumption choices. I have made a social network that allows users to share how they personally connect to social, environmental, and health related events

happening in our society, and illustrate how the products they buy serve as an extension of their formed values. For example, socially conscious users can opt to share Fair Trade products, and environmentally conscious users may choose to share Benefit Corporation, 1% For the Planet, and Rainforest Alliance certified products. Overall, I want see if current event issues can be used to prompt more sustainable consumer action, which in turn can allow people to shape social identity with a direct tie to social impact. Over recent history, people have perceived themselves to have more of a growing impact on external conditions through their individual choices. Today, with intensifying issues consumers are putting their values behind business more so than ever before, while social media is being used to shape such a large portion of personal identity. These two trends could potentially align in a social impact network aimed to express, and share individual power to shape conditions around us.

“Once in a Dark Land, There Was a Creepy Octopus!” A Study of Young Children’s Storytelling

Shilpa A. Mookerji (Dr. Maureen Vandermaas-Peeler) Department of Psychology

Storytelling allows children to build literacy, vocabulary, and social interaction skills. These skills are supported by the main caregivers in their lives, parents and teachers. This study was designed to examine children’s stories with a focus on 1) development of narrative complexity over time; 2) influences of teacher support on children’s narratives; and 3) influential aspects of the social context. We analyzed 255 children’s stories from a preschool that incorporates weekly storytelling activities into the curriculum. Using a case study methodology, the stories of four children told over a two-year span were coded for similarities and changes in themes, emotional connections, and narrative complexity. The teacher’s involvement was coded by examining ways she scaffolded and supported the children’s narratives (e.g., by asking “What happens next?”). Information about the social context was also coded (e.g., told with a peer or with a specific provocation). Results of qualitative coding showed a slight increase in narrative complexity of stories over time, with gains of approximately one point on average (ranging from 2 to 5 on a 5-point scale). However, the four children’s stories varied considerably. One child maintained a high level of narrative complexity over time, whereas others had a more erratic pattern. Certain themes were prevalent and recurred in children’s stories, including family, superheroes, and fairytales. Often, one child’s story characters and themes influenced other storytellers in a given week. Results also indicated that the teacher provided sensitive guidance tailored to the level of the storyteller, with simple prompts to develop a plot or add characters in the beginning of the schoolyear and more extensive guidance regarding story fluency and detail as children became more experienced. Teacher scaffolding also fluctuated with aspects of the social context. For example, when the teacher invited certain story provocations (e.g., inviting Dr. Martin Luther King Jr. into the story, or asking children to focus on “signs of spring” in their stories), she provided higher levels of scaffolding. Overall, findings highlighted the importance of scaffolded, interactive storytelling for children’s emergent literacy and oral communication skills as well as the role of social context on storytelling.

Help-Seeking for Mental Health Concerns: The Role of Partner Influence

Emma Muscari (Dr. CJ Fleming) Department of Psychology

Romantic partners are thought to have an influence on mental health help seeking, but limited research exists on this process. The present study sought to better understand help-seeking behavior for mental health concerns by examining how various conversational tactics (autonomy support, accommodation, and criticism) and other variables related to help seeking can be used to facilitate help seeking. The sample consisted of 282 adults (ages 19-74; 64% female) who were recruited on Amazon's Mechanical Turk, and reported being diagnosed with a mental health condition and currently in a romantic relationship. All survey participants were asked about their mental health history, romantic relationships, and help-seeking perceptions. Additionally, each participant was randomly assigned to receive one of the three vignettes that contained the autonomy supportive, accommodating, or critical partner messages, which were all characterized by high/low levels of challenge and high/low levels of acceptance (per confirmation theory; Dailey, 2010). Results suggested that receiving autonomy supportive or accommodating communication may increase confidence in treatment. Analyses of measures of help-seeking indicated that greater levels of partner accommodation, motivation, finances, perceived treatment effectiveness, less disapproval from one's social network, and lower perceived control over the mental health condition serve as predictors of current treatment engagement. Given that numerous barriers prevent those with mental health concerns from accessing the care they need, it is important to distinguish and promote the facilitator role of partners in mental health help-seeking.

Mothering through Discrimination: Exploring How Black Mothers Cope with and Socialize the Responses Their Daughters Give to Discrimination Stress

Alexis A. Roberts & Bridgette Agbozo (Dr. Buffie Longmire-Avital) Department of Psychology

For African American women, chronic and acute stressors associated with sexism and racism are linked to their mental and physical health outcomes (Perry, Harp, Oser, 2013). However, in the stress and coping literature (Dijkstra and Homan, 2016), there is still a lack of empirical focus on Black women and consequently how their sociocultural environment is a significant contributor to their experience and expression of stress. For many Black women, the attempt to develop and maintain a positive sense of self and value their own worth is often bombarded by the "cold winds of multiple counter-opinions" (Cooper, 1990). This current study has two primary aims: (1) to understand the psychosocial experience of mothering while Black and the implications of discrimination on the well-being of these mothers; and (2) to explore how Black mothers socialize coping responses to discrimination for their daughters. Forty-nine Black, African American women with daughters between the ages of 13-24 participated in an online mixed data survey with both Likert scale and open-ended questions. Participants were recruited through various online social networking platforms. Using a grounded theory approach with iterative coding we found that many of the women reported their own stress as a minority woman in the United States originating from the stress of enduring discrimination ($n = 13$) and managing a household ($n = 13$) as both the provider and homemaker. Bivariate analyses revealed that many of the mothers reporting greater attendance at religious services concurrently reported lower perceived stress ($r = -0.36$) and conversely, those who reported lower religiosity reported greater perceived stress ($r = 0.42$), internalization ($r = -0.32$) and detachment ($r = -0.39$). These findings suggest that for Black mothers who are actively attempting to navigate through the social role

stress of mothering while simultaneously balancing chronic racial-gendered racism, religious faith and engagement maybe paramount for well-being.

Linguistic Framing of Charitable Donation Requests as Verbal Behavior: An Exploratory Exercise in Translation

Annamaria V. Sotolongo (Dr. L. Kimberly Epting) Department of Psychology

Linguistic frames are the associations and mental constructs that are evoked by words or phrases and may affect how people respond to those words or phrases (Lakoff, 2004). Previous research in our lab has shown that using different fund name frames and explanation level frames in requests for charitable donations can influence both how likely someone is to donate and how much they will donate to a nonprofit organization (Epting, Phelan, & Brown, 2018; Epting, Snowden, & Walker, 2018). Although these investigations have been viewed from the stated linguistic framing perspective in the past, we believe it may also be useful to view them from a behavior analytic framework as an example of functional verbal behavior (Skinner, 1957). According to Skinner, functional verbal behavior focuses on the idea that a meaning of a word is found in their functions, that is, how it affects responses of listeners (1957). Behavior analysts working on verbal behavior generally have not tackled everyday community language questions, despite their great successes in verbal behavior work with special populations. Some of their verbal behavior work includes studying autoclitic combinations and mands. Autoclitic combinations are verbal behaviors that modify the functions of other verbal behaviors, while mands are a verbal operant in which a response is reinforced by a consequence, as in when one responds to a request. This project represents a short exploratory translation of the study described above that investigated the effects of different fund name frames and explanation levels frames into the verbal behavior perspective as autoclitic combinations that produce effective mands for giving behavior. By studying the function of language related to giving behavior, one can further understand the multiple variables that increase the likelihood and amount of money donated to various welfare organizations.

Public Health Studies

Investigating the Relationship between Spirituality and Health: A Case Study on a Holistic Health Care Facility in North Carolina's Piedmont Region

Maya C. Aboutanos (Dr. Katherine Johnson) Department of Public Health Studies

Purpose/Background: The purpose of this research is to investigate the relationship between spirituality and health through a case study of a holistic health care facility in North Carolina's piedmont region. Scholarly discourse, patient care models, and healthcare organizations have increasingly recognized the spiritual dimension of health as relevant in multidimensional and holistic understandings of health. *Methodology:* Through a case study, the research examined the interrelationships between three scholarly narratives: 1) health practitioner training and personal spirituality; 2) the integration of the spiritual dimension of health in patient care; 3) the role of holistic, integrative, and alternative forms of medicine in addressing spiritual needs. Data collection involved practitioner interviews (N=4), patient phone interviews (N= 5), one focus group (N=6), and shadowing and direct observation. Analysis of the data included coding for

recurring themes within the three scholarly narratives, exhibited as practitioner, patient, and clinic perspectives, as well as through the lens of the socio-ecological model. *Results:* 1) From the practitioner perspective, key themes include the individual pursuit of multidimensional health education, personal spirituality's role in occupational discernment and health practice, and spirituality as a framework through which to perceive patient care. 2) Findings from the patient perspective include understanding health through the eyes of their Creator, the value of personal prayer in healing, and aligned values promoting trust within practitioner-patient relationships. 3) The central perspectives held by the clinic include understanding humans as interwoven mind, body, and spirit by design and recognizing holistic health as a practitioner-patient partnership. *Conclusion:* Findings support spirituality as a social determinant of health through the significant role of spirituality in personal health as well as patient care. Routinely incorporating spiritual considerations into standard health perceptions and practice will expand understandings of health and encourage multidimensional practice models. This study provides the unique opportunity to evaluate the patient-practitioner relationship within a holistic health care center, as well as investigate to what extent the spiritual dimension of health is being addressed in patient care, and how that further impacts personal health.

Examining the Jamkhed Model: A Collaborative, Comparative Study of Hypertension in Rural Indian Villages with the Comprehensive Rural Health Project

Bonnie S. Bloxom (Professor Amanda Tapler) Department of Public Health Studies

Cardiovascular disease (CVD) is the leading cause of mortality in India with hypertension being one of its most significant risk factors. Over one-third of India's population has hypertension and the burden of CVD in rural India is exacerbated by limited access to preventative and curative services. This collaborative research project was conducted in the state of Maharashtra, India with the Comprehensive Rural Health Project (CRHP), a non-profit organization utilizing an evidence-based primary healthcare approach, called the Jamkhed Model. This model includes community participation, empowerment, and integration of Village Health Workers (VHW) to initiate social change and improve health outcomes. Three villages utilizing VHWs and three control villages within Maharashtra were randomly selected to participate. Approximately equal number of participants in each village type, 40-70 years, with hypertension were randomly sampled. The sample size of 132 was calculated to attain 85% statistical power, to determine whether or not hypertension was managed in each village type, at the 5% significance level. A modified version of the World Health Organization's STEPS survey was utilized to capture three blood pressure readings and hypertension-related knowledge and behaviors. Furthermore, 10 focus groups and 16 semi-structured interviews were conducted to further evaluate the role of VHWs on hypertension behavior and management. There are statistically significant differences in the mean systolic blood pressure between the intervention villages ($M = 140.3$) and control villages ($M = 143.1$, $p = .01$) and proportion of stage 1 and stage 2 hypertension ($p = .02$). Additionally, the presence of a VHW increased the likelihood of having well-managed hypertension (OR 2.07, 95% CI: 1.13-3.78; $p = .01$). Intervention villagers were more likely to discuss blood pressure with a VHW regularly and receive lifestyle advice about hypertension in the past three months as compared to control villages ($p < .01$). Qualitative research findings provide evidence about the high levels of health literacy and health-related self efficacy among those living in intervention villages and reveal how VHWs empower individuals by providing hypertension education and support. In conclusion, these results indicate that VHWs increase

villagers' awareness of lifestyle behaviors associated with hypertension and support management of hypertension.

A Leadership Prize Project: Mental Health Needs and Perceptions among College-Age Students in Post-Revolution Tunisia

Sarra Eddahiri (Dr. Katherine Johnson) Department of Public Health Studies

The World Health Organization defines health as “a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity” (WHO, 1948). Unlike cancer or chronic diseases, which often have visible effects on the physical body, mental disorders represent a complex modern issue in medicine and public health, and are often poorly understood and socially stigmatized in a variety of country contexts (Davey, 2013). This research is a preliminary study that uses an exploratory sequential mixed-method design to assess the needs and perceptions surrounding mental health within a population of Tunis-based college students aged between 18 and 30 years old. The study results were collected through 80 online surveys and 5 interviews. The research results show that 77% of Tunisian young adults would like to learn about mental health and 36% reported that they personally need a mental health intervention, while 20% reported that in case of depression they choose not to inform anyone. A large portion of the sample, and more specifically 70%, reported a lack of accessibility to mental health services in Tunisia and 40% a lack of openness to the topic of mental health. Due to the lack of access to services and conversations surrounding mental health, 49% of the surveyed population reported that they prefer to research their symptoms in the internet instead of informing someone. Throughout the interviews the main factors that were indicated to cause young adults not to openly communicate their feelings were: culture, gender roles, sexual orientation and family approval. The data suggest a need for orientation and promotion of available mental healthcare options in Tunisia. This study will be informing the implementation of an informative website for the target population.

Traveling Healthy: Elon University Undergraduate Students' Pre-Travel Health Behaviors and Health Outcomes Regarding Study Abroad

Sofia A. Huster (Dr. Katherine Johnson) Department of Public Health Studies

This project explores how Elon University undergraduate students assess potential health risks related to international travel, in order to identify key barriers and facilitators to a healthy study abroad experience. Elon University sends more students abroad than any other master's level institution in the United States. Past studies have shown that while there are many areas for student's personal growth through study abroad experiences, students also encounter many travel health risks, due to their increased likelihood to participate in risky behaviors while abroad. There is a lack of research on students' physical and mental health preparation for their study abroad experience, and their resulting health outcomes while abroad. In order to address these topics, this study used a mixed-methods design involving pre-abroad (n=27) and post-abroad surveys (n=13) and pre-abroad and post-abroad phone interviews (n=8). Research was conducted over the course of the Elon undergraduate's study abroad experience during Spring 2018 in order to examine pre-travel health behaviors and health experiences and compare outcomes across host countries. Study participants were predominately female (94%) and juniors at Elon University

(98%). Students studied abroad in Europe (70%), Latin America (16%), The Middle East (4%), Africa (4%), Asia (4%) and Australia (2%). The quantitative and qualitative findings denote a low risk perception among 83% of students across all health threats, and low uptake of pre-travel health advice. The majority of students (79%) only conducted Internet research before traveling abroad. The study found that the greatest barriers to students' health while abroad included language barrier, living off-campus, outside travel and lack of adequate resources. While students felt they had adequate resources to manage their physical health while abroad, they did not feel they had adequate resources to manage their mental health. The study also identified facilitators to the health of students while abroad. These included having an action plan, living with a host family and general nutritional practices. Overall, the results of this study indicate that students' low risk perception challenges their health preparedness while abroad. The findings can aim future-decision making for universities and among the student population for healthier travel experiences.

“The doctor said it was fine and to vaccinate her; so, I trusted her word and did it, but I'm still afraid”: The Role of Triadic Communication in Understanding Human Papillomavirus Vaccination in Latina Adolescents

Taylor Danielle Jones (Dr. Stephanie Baker) Department of Public Health Studies

In the United States, Latina women die of cervical cancer at greater rates than women of other races and ethnicity. The human papillomavirus (HPV) vaccine is known to prevent death from cervical cancer, yet many adolescents remain unvaccinated. Efforts to increase vaccination rates exist, but significant disparities are affecting Latina youth. Predictors of vaccination include provider recommendation and caregiver-patient perception. While the role of the provider, caregiver, and patient has been well studied, the interaction of all three, the triad, is not widely investigated in the literature. The aim of this study is to understand the role of triadic communication in Latina adolescents' HPV vaccination experiences. Three components of triadic communication 1) behavior, 2) conversation symmetry, and 3) content of the interaction, provide the framework for this project. Principles of community engaged research were used including: community advisory boards, training Spanish-speaking community members to conduct focus groups and analyze data, and reporting findings back to participants for verification of identified themes. Qualitative data collection methods included individual interviews with providers (n=6), and one-time focus groups with Latina adolescents (n=6), and Latina caregivers (n=5). Findings suggest conversation asymmetry was present, when adolescents were less involved in communication. Further, providers reported offering limited information as a strategy to promote vaccination, while caregivers and adolescents reported dissatisfaction with the limited information provided, even when vaccination occurred. Generational knowledge gaps were identified, with caregivers feeling unable to ask questions to clarify and understand the content of the interaction in order to provide explanations to their adolescents. Future research is needed to understand how triadic communication interactions with Latino populations can be improved to inform decision making about HPV vaccination among the triad.

“The Struggles of Fertility Are More Difficult than the Struggles of Cancer”: Adolescent and Young Adult Cancer Survivors’ Perspectives on Fertility Preservation

Francesca A. Music (Dr. Cynthia Fair) Department of Public Health Studies

Though fertility is a well-documented concern for patients and can contribute to greater quality of life, oncologists rarely begin conversations with adolescent and young adult (AYA) patients on the possibility of treatment-related infertility and fertility preservation (FP) options. This study examined FP-related experiences and factors that influenced such discussions from the understudied perspective of AYAs. Participants also developed recommendations on how and when healthcare providers should address fertility. Forty AYA cancer survivors, (35 females, age range at diagnosis 17-29 years) participated. Seven participated in a focus group recruited locally from a cancer support program and 31 completed an online survey posted on cancer-related social media platforms. Fifteen survivors who completed the survey also participated in a phone interview that explored experiences in greater depth. Focus group, survey, and interview questions addressed FP experiences and consequences, quality of life, mental health and recommendations for medical providers. Focus group and interview transcripts were coded using grounded theory to guide analyses. Though approximately 60% of participants were informed about possible cancer-related consequences of fertility at diagnosis, the majority were dissatisfied with the quality of the conversation and had difficulty recalling information. Topics such as sexual health, quality of life, and coping with infertility were rarely covered. Among those who pursued FP, many women felt unprepared for the invasive nature of the process. Those who declined or were unable to access FP described mental health consequences, loss of identity, and relationship stress. One participant noted, “The grief is overwhelming...My legacy is ending with me and that has been really hard for me to grasp.” AYAs advised oncologists to discuss FP consequences at diagnosis and revisit the topic regularly, report all FP options, provide specific fertility-related data, and collaborate with other health care providers such as reproductive specialists and mental health counselors. Physician-initiated FP information should be presented in an accessible manner that allows AYAs to revisit material across their course of treatment. Integration of mental health services that directly address FP decisions will improve the quality of life for AYA cancer survivors.

The Art of Malaria Education

Stephanie B. Ntim (Dr. Katherine Johnson) Department of Public Health Studies

Malaria is a major health concern in Ghana as well as other countries in West Africa, where it is estimated that more than 300 million people are at risk of malaria infection (Awine et al., 2017). While prior research has highlighted promising school-based interventions often facilitated through textbook information or teacher-based lectures to promote awareness about the disease, less is known as to how well such interventions are able to actively involve and engage students in learning about malaria in their schools. This research examines the role of the performing arts as a heuristic for student-centered teaching and learning about malaria. Using a convergent parallel mixed-methods study design, an arts-based malaria education model was deployed in a junior high school in Pepease, Ghana (a semi-rural town on the Kwahu plateau). The proposed product included a peer-peer education model through which students worked in groups to demonstrate their learning of relevant facts about malaria through their own creation and

participation in song, dance, and drama performances. Pre- and post-tests, coupled with focus groups with student participants were used to examine the impact of this art-based approach to malaria education. Research findings currently show that the art-based malaria education program can be beneficial to students, by requiring them to use the performing arts to engage with information about malaria transmission, prevention, and treatment. Students correctly identified that malaria is caused by a mosquito bite, and they correctly identified symptoms of malaria, although students were reluctant to say that they will regularly use insecticide-treated mosquito nets as a preventive measure for malaria.

Evaluating the Biopsychosocial Needs of Internationally Adopted Children with HIV

Madeline J. Piper (Dr. Cynthia Fair) Department of Public Health Studies

An increasing number of U.S. parents are adopting children living with HIV from other countries, yet little is known about this population. The purpose of this study was to identify the needs of internationally adopted children living with HIV from key informants, including adoptive parents ($n = 25$) and HIV care providers ($n = 11$) including social workers, adoption agency staff, and medical personnel specializing in pediatric HIV. Participants completed 60-minute, semi-structured, audio-recorded phone interviews. Questions focused on child and family needs associated with HIV disclosure, psychosocial support, and medical considerations. Two reviewers independently coded the transcribed interviews. Following the traditions of the grounded theory method, analysis began with a process of open coding. Reviewers compared emergent themes to reach consensus. Identified themes can be best understood through the dynamic biopsychosocial model, which highlights the role of social dynamics, in addition to the interdependence and centrality of systems. Biological factors reported to influence children's needs included age at adoption, HIV diagnosis, and overall health. Participants generally agreed that managing their child's HIV infection was not difficult due to high levels of adherence to antiretroviral treatment. Psychological aspects included cognitive development, emotional regulation, and effects of trauma. Findings indicated that adoptive families often struggle with the emotional and behavioral consequences of early loss. Participants stated that the effects of trauma can be seen in the child's management of anger, attention, and delayed attachment with the family. Approximately a third of parents reported their child was diagnosed with a psychological disorder, such as Attention Deficit Disorder or Reactive Attachment Disorder. Finally, social aspects reported to impact children included stigma, resource availability, financial responsibility, and religion. Adoptive parents frequently worked with faith-based adoption agencies and religion typically played an important role in their lives. Providers highlighted the importance of developing an HIV disclosure plan with families that takes into consideration the child's age, cognitive status, and social situation. Providers also emphasized the importance of mental health care throughout the child's life. The dynamic biopsychosocial model allows for a more holistic approach to addressing the needs of internationally adopted children with HIV.

Religious Studies

“Migration and South India’s Shifting Landscapes: Social and Religious Change in Kerala”

Kathryn B. Gerry (Dr. Amy L. Allocco) Department of Religious Studies

This ethnographic research project explores the connections and flows created by worker migration from the state of Kerala, India to the Gulf region. It examines how outmigration affects relationships between and among religious communities in Kerala and manifests in changes to styles of dress, the architecture of religious sites, and gender and other social roles and relationships. At its broadest level the project focuses on how more conservative Gulf ideologies flow back to Kerala along with remittances: whether these ideas travel back to South India along with migrating workers or are transmitted virtually via Skype calls and WhatsApp messages, their effects are visible and significant. More specifically, the project asks how the phenomena of worker migration influences religious practices, both in the Gulf and back at home in Kerala, and investigates how it might change the nature of interreligious encounter itself. The project will draw on in-person interviews and participant-observation in Kerala as well as virtual interviews with Gulf workers and will analyze how these many changes – in dress and architectural styles, in gender roles and relations, and in social and religious communities – are understood by migrants, their families, and their communities. It will investigate these dynamics and realities through five weeks of participant-observation and interviews with the families and communities of migrant workers in Kerala as well as virtual interviews with workers located in the Gulf region in the summer of 2019. Currently, it is grounded in an extensive literature review focused on Indian migration and migrant experiences, flows between South India and the Gulf, the social and economic history of Kerala and its contemporary status, religious dress and gender, and the traditional South Indian architectural style of religious sites.

(Mis)Translating Christianity

Brianna F. Elder (Dr. Ariela Marcus- Sells) Department of Religious Studies

Missionaries often accompanied colonizing western powers, like the French and the British, as they established their rule over West Africa. In this project I use two case studies, one focused on the Ewe in what is now Ghana and Togo and the other on the Yoruba in what is now Nigeria, to examine how missionaries translated Christianity to West African peoples during the colonial period (include time range). Using methodological insights of postcolonial theory, I analyze how interactions between missionaries and local populations produced unique forms of Christianity specifically and religiosity more generally I then use these case studies to add to theoretical models of the development of the category of religion in Religious Studies scholarship. Ultimately, I will use this theoretical framework as the basis for an examination of missionary journals and diaries from nineteenth century West Africa, thus adding to our understanding of how “Religion” developed from conversations between European and African peoples.

From American Apocalypse to American Medina: Black Muslim Theological Responses to Racial Injustice in The United States

Joel P. Green (Dr. Ariela Marcus-Sells) Department of Religious Studies

When asked about American Muslim involvement in Black Lives Matter while attending a conference in Canada in late 2016, Shaikh Hamza Yusuf, a prominent American Muslim leader and founder of the first Muslim-American college, said, “The United States is, in term of its laws, one of the least racist societies in the world. We have some of the best anti-discriminatory laws on the planet... There are twice as many whites that have been shot by police but nobody ever shows those videos.” Many viewed his comments as insensitive, sparking intense controversy in the American Muslim community. This incident, and others like it, reveal the tensions that run through Islam’s history in America, as Muslims are forced to grapple with their identities in personal, communal, and national discourses. This incident led me to investigate how four of the most prominent Black Muslim Americans understood the intersection of their racial, religious, and national identities. Elijah Muhammad, Malcolm X, Warith Deen Mohammed and Louis Farrakhan are all current or former leaders of the Nation of Islam, a Black American religious group established in the 1930s, whose theology focuses heavily on racial injustice in the United States. My objective in this project is to analyze the teachings of the Nation of Islam’s most influential leaders in regards to racial injustice in the United States. Using a historical critical analysis of primary sources based in postcolonial theory, I will demonstrate that the theological responses of the NOI’s leaders can be divided into three major categories: Armageddon, *Tawhid*, and American Medina, which are developed in accordance with their respective understandings of race and racial formation. Ultimately, this analysis allows us to look at the difficulties and questions surrounding the navigation of Black, Muslim and American identities from the perspective of Black religious and social leaders. The insights gained from exploring these questions are useful in today’s social context, as Yusuf’s comments and aspects of the current political climate indicate that these categories remain contentious and salient.

What Would be the Answer to the Answer Man? How the Grateful Dead Developed a Religious Following

Leah Kay (Professor LD Russell) Department of Religious Studies

As traditional religions in the United States continue to diminish for many Americans, non-traditional forms of religious experience grow and influence people by offering ways to satisfy needs traditionally met by established religious institutions. As an example, the Grateful Dead is an American rock band whose music and culture have had a profound impact on Americans for generations. This impact is often more expansive and lasting than many other bands have had. Due to their influence, many outsiders, and often insiders, of the Deadhead community consider the band’s following to be religious in nature and fervor. The primary purpose of this paper is to investigate how the music, culture, and community of the Grateful Dead’s following (also known as Deadheads) parallel characteristics of traditional religions, and how those characteristics of religion are still seen among contemporary Deadheads. Through various avenues, the Grateful Dead has exposed people to religious characteristics. For instance, one defining characteristic of a religion is that its followers are bound by a form of social cohesion, which is seen in the Deadhead community (Cline, 2018). Many people question the authenticity of the Grateful

Dead's following as religious, claiming it cannot take the place of traditional religion. This paper interprets the religiosity of Deadheads through Victor Turner's sociological theory of *communitas* and Robyn Sylvan's theories about religion and popular culture. Furthermore, this research utilizes information gathered from interviews with members of the Deadhead community in addition to readings, online forums, and entertainment media to better understand the religious aspects of the community. The interdisciplinary approach found in religious studies (incorporating psychological, sociological, and anthropological approaches) offers a deeper understanding of how the Grateful Dead and its following draw on characteristics that can best be understood as religious. This study shows that the Deadhead community did meet the criteria of being a religious following. The conclusion is significant because it offers clear evidence that religion is not necessarily disappearing, but instead, shifting to unexpected territories.

Is Faith-Based Community Organizing Still Relevant? How Cultural Shifts are Changing the Conversation

Kristina J. Meyer (Dr. Rebecca Todd Peters) Department of Religious Studies

Throughout the history of the United States, various groups of white Christian leaders have both perpetuated and fought against systemic injustice through social movements. Over the last 50 years, the demographic landscape of the United States has shifted away from white Christian hegemony towards diversity and religious pluralism. In this context, faith-based social justice organizations must reevaluate their mission and structures to engage more effectively in a new socio-political context. The presenting question is how white Christian faith leaders, particularly within interfaith organizations, should respond to an awareness of complicity within the system to ethically and effectively bring people together across lines of religious difference for social transformation and the common good. For this project, I conducted participant-observation research and interviews with Interfaith Worker Justice (IWJ), a national interfaith organization. The data was collected from three affiliates and included 54 interviews with board members, staff, and volunteers at the national and local levels. My attention to the effectiveness of the practical work being done by IWJ is grounded in Reinhold Niebuhr's focus on pragmatic justice as the most appropriate means to approach structural equality and equity in social relationships. My analysis and conclusions build on Rebecca Todd Peters' ethic of mutual solidarity and Mary Belenky's theory of constructed knowing to argue that the relationships between faith communities and minoritized individuals should exist in such ways that recognize and integrate the unique strengths of both groups. I argue that faith communities must navigate a new awareness concerning injustice and privilege without becoming paralyzed by guilt. They must recognize the value and moral authority of using a faith voice to advocate for social justice in mutual partnership with those most visibly impacted by injustice.

Discrimination and Profiling: A Student Response

Sonya A. Walker (Dr. Amy L. Allocco) Department of Religious Studies

I will be one of two student respondents to the SURF Symposium titled, "Rising to the Challenge: South Asian Communities and Globalization." In this response, I will introduce my research project titled, "Islamophobia and Sikh Misidentification in the American Airline Industry" that I am just beginning this semester. I will then pose questions about conducting

research on South Asian topics to the presenters based on the early insights I have gained from my preliminary investigations. My project employs a survey methodology to examine profiling policies and practices in US airlines since 9/11. It aims to bring together the spectrum of perspectives on airline practices by airline employees and understand the airline industry's perception of religious traditions based on their policy documents. This research has introduced me to literature on discrimination and profiling. On that basis, I will initiate a dialogue with the other presenters about whether and how the South Asian communities they have studied navigate systematic discrimination and about the strategies they adopt for responding to widespread misperception of their traditions. My response to this panel will also be informed by background information from my studies on the roots of Islamophobia in the United States as well as the historical conflation of race, religion and progress.

Identity, Religion, and Secularism: The Ongoing Danish Debate

Sophie R. Zinn (Dr. Brian Pennington) Department of Interreligious Studies

In Spring 2018, I conducted fieldwork in Denmark that sought to understand how different religious and non-religious communities construct Danish identity and what influence Denmark's secular culture and established state church might have on the construction of this identity. My project seeks to bring the academic literature regarding Denmark's secular public sphere, Danish state policies that target religious expression, and association of religious and Danish identity, into conversation with personal narratives recorded during my fieldwork in Copenhagen. These narratives are drawn from the nine long-form interviews with young adults aged 20-35 who identify as Muslim, Christian, or non-religious. Taken together, these sources shed light on how Denmark's political and religious discourse affects people at the level of personal experience. The academic literature suggests that Danish identity, secularism, and religion are not uniformly understood among Danes but, by focusing on young adult Danes, I was able to discover interesting trends that are absent from existing scholarship: there is a strong generational variance in the understanding of Danish and religious identity, and younger generations take a more individualistic approach to the construction of these identities. These nine participants also highlighted that the media and the Danish constitutional right of freedom of speech has been detrimental to community-building between ethnic Danes and second- or third-generation immigrants because of a lack of equal representation in these forms of discourse. Throughout these nine interviews, young adults argue for a more accepting and representative society that promotes freedom of religion and also a cohesive-yet-multicultural Danish identity.

Sociology and Anthropology

Diversity and Racial Equity in Higher Education

Micalah A. Collins (Dr. Muriel Vernon) Department of Sociology and Anthropology

Over the past few decades, predominantly white institutions, or PWIs, across the United States have increasingly embraced the pursuit of becoming more racially and ethnically diverse and inclusive, causing an increased adoption of policies, structures, programs, and initiatives centered on diversity and inclusion. This trend has led to the evolution of a distinct diversity

discourse utilized by universities to address the increasing racial and ethnic differences among their student, faculty, and staff populations. However, recent research suggests that such focus on diversity has allowed PWIs to ignore, obscure, and even perpetuate the racial inequities that persist, inhibiting any effort to create and sustain racially equitable change. Thus, the purpose of this study was to discover how diversity discourse influences the ability of PWIs to address and advance racial equity through critical discourse analysis. The researcher conducted interviews with several diversity practitioners at a private, liberal arts PWI in the southeastern U.S. in order to analyze their perceptions of diversity as a discourse and its effect on the university's ability to advance racial equity. This study found that, in line with previous research, the uncritical adoption of diversity discourse has created language and practices that give the university the appearance of a diverse and inclusive environment. This effect not only obscures the many ways in which the university is not diverse or inclusive of racial and ethnic minorities, but also prevents the widespread development of a framework to address the issues of racial inequity and injustice that are inherent to the university as a predominantly white institution. These findings suggest that a shift from diversity discourse to a more equity-centered approach is needed in order for such universities to effectively devote effort to racial equity.

Incorporation of Contemplative Practices in Higher Education: Student and Faculty Perspectives

Grace B. Flink (Dr. Alexis Franzese) Department of Sociology and Anthropology

Contemplative pedagogical approaches may be a strategic and effective way for faculty to enhance the student experience and more holistically engage students. As part of a larger study being conducted on contemplative practices on campus, focus groups were conducted with university faculty, staff, and students to consider how to incorporate contemplative practices into higher education classrooms. Participants included nine faculty and staff members (two groups), and twelve students (two groups). Participants were asked a series of open-ended questions about the degree to which they perceived contemplative practices to be a positive addition to students' learning experiences. Analysis of participant's responses revealed several areas of importance and relevant themes. Students were concerned with understanding why incorporating practices could be beneficial, how much class time would be utilized, and if participation would be mandatory. Students also discussed their views on professors as experts of contemplative practices. From the faculty and staff perspective, many potential benefits of using contemplative practices in university classrooms were endorsed, including the improved relationships with students, decreased mindlessness, decreased burnout, and overall positive impacts on student learning. Faculty and staff also described obstacles to inclusion of contemplative practices such as disciplinary considerations, student receptiveness, time of day considerations, and technology as a source of distraction. Across faculty, staff, and students there was a desire for practices to be related to the disciplinary content of the class and to be of a brief duration. Overall, these groups provide insights to the incorporation of contemplative practices in university classrooms. This study reveals that there is an overall interest to bring contemplative practices into classroom settings, a desire to understand the use and usefulness of such practices, and a realization that practices should be chosen thoughtfully with regard to disciplinary content in mind.

Fashion as Impression Management: How What We Wear Communicates and Manages Perceptions of Identity

Sasha J. Kagan (Dr. Alexis Franzese) Department of Sociology and Anthropology

Fashion items (i.e., clothing, accessories, shoes) can have a shared meaning that may be used by the wearer to communicate something (e.g., identity) to others. Scholars have found that behavior is motivated by a desire to evoke certain reactions from others, and that, with regard to fashion, this is possible through the shared meaning of those items. However, across studies, a gap emerges in our understanding of what factors affect the strength of the shared meaning, and the ways in which the use of fashion items to communicate identity breaks-down in the absence of shared meaning. Existing research has focused more on the general idea that fashion has symbolic meaning and that people use it to communicate, than on first-hand accounts of how women utilize adornment. The purpose of this study is to elucidate how fashion is used by women to communicate one's identity, addressing the factors that contribute to the shared meaning of items, ideas of impression management, and reasons why people wear things. Female study participants completed an online survey in which they were classified as being in the control group or one of the three experimental groups. Participants in the experimental groups were presented with questions in which the brand and wearer of certain items were manipulated according to status (i.e., high or low status). Based on existing research we expect to find that (a) fashion items have the power to create an impression of the wearer, (b) that this power depends on the status of the brand and wearer, and how those interact, and that (c) women use fashion to communicate their identity in both explicit and implicit ways. The results of this study are considered within the framework of the symbolic interactionist theory—which studies society through individual, everyday social interactions and experiences by looking at the use of symbols—and will deepen sociological understandings of fashion. Beyond the discipline of sociology, this work has important implications for both producers of fashion who are invested in the industry, and consumers of fashion who are interested in effective self-presentation.

Factors Influencing Recycling Behavior Among College-Aged Students

Elizabeth S. McDonald (Dr. Alexis Franzese) Department of Sociology and Anthropology

Despite the growing understanding of the critical need for recycling as part of environmental sustainability and stewardship efforts, it is not universally practiced. Previous literature has emphasized the importance of knowledge and awareness about recycling programs and practices as determinants of increased levels of recycling behavior. Attention must be paid to the discrepancy between awareness of the benefits of recycling and the actual practices of many people. The purpose of the current study is to expand on this work and understand what motivates individual recycling behavior in a specific social context: the college or university setting. Data was collected from students at a mid-size university in the southeastern United States. Students were asked about the influences of various factors on behavior, with attention paid to both internal factors (such as perception of ease and perception of importance) and external factors (such as pro-environmental attitudes, altruism and economic incentivization). The data also allows for investigation of how demographic factors including age and gender, influence recycling behavior. Results indicate that certain factors, specifically perception of importance and pro-environmental attitudes, affect recycling behavior the most. Additionally,

there was a significant relationship between gender and recycling behaviors, indicating females recycle more than males. This research is central to our very survival. It's critical for humans to understand the impact they are having on the Earth and to look for ways they can best reduce this negative impact. Recycling is just one of the ways this can be done.

“Either I’m good at my job or they’re good at hiding it:” RA perceptions of their role in responding to substance use at Elon

Cameron A. Mullins, Hannaleigh Pierce, & Mackenzie Martinez (Dr. Jennifer J. Carroll)
Department of Sociology and Anthropology

The topic of substance abuse on college campuses is an issue that must be addressed by higher learning institutions across the United States. In this study, we sought to understand the perception of Resident Advisors' (RAs) role in preventing and/or responding to substance use in the community. Specifically, we sought to better understand what student RAs' want to know and how they wish to be prepared and equipped in responding to substance use emergencies among their residences. Participants must have been over 18 and employed as an RA at the time of recruitment. They must have gone through basic opioid and naloxone training (led by Dr. Jennifer Carroll) which was offered to all residence life staff at their regularly scheduled employee training. A convenience sample was recruited from the full population of RAs at Elon University who attended the training. Semi-structured interviews designed to explore participants' knowledge of substance use and perceptions of their responsibilities as RAs were carried out by Sociology 215 students in the fall of 2018. After interviews were completed, each researcher transcribed his or her own interviews. Transcriptions were then open-coded by all Sociology 215 students and subsequently re-coded based on emerging themes related to job responsibilities and reactions to substance use. Further analysis revealed that RAs feel responsible for the safety of their residents and want to be a well-equipped resource for their residents in a substance use crisis. Many respondents expressed strong interest in receiving more training and having direct access to overdose response tools, such as naloxone, but felt specifically barred from doing so due to liability concerns related to their role as university employees. Given that RAs have such a strong impact on the wellbeing of the average student at Elon, these findings suggest that certain changes in policy and practices at Elon may be appropriate. These may include: new orientation trainings; clarifying the scope and limitations of RAs' responsibilities; and exploring strategies to better equip all students with the knowledge and resources they need to successfully respond to substance use emergencies.

In Search of Equality: Identity Formation and Activism in College-Aged Women

Mariatu I. Okonofua (Dr. Raj Ghoshal) Department of Sociology and Anthropology

In “Race, Ethnicity, Sexuality, and Women’s Political Consciousness of Gender,” sociologist Catherine Harnois (2015) concludes that for women belonging to multiple minority statuses (e.g. race, sexuality, ethnicity), their experiences with other forms of discrimination yield an increased level of gendered political consciousness, which refers to the recognition of gender inequality and inequities as well as the desire to *actively* rectify these issues in pursuit of the common good (Miller, 2002). Simultaneously, Harnois acknowledges uncertainty as to whether an individual’s “political consciousness of gender [is] fundamentally transformed when combined with a

political consciousness of race, ethnicity, and/or sexuality” (Harnois, pg. 382, 2015). This study, based on 20 interviews and 310 survey responses of college-aged women of varying racial and ethnic backgrounds, as well as a focus group of 18 college-aged women of color, seeks to fill this gap in knowledge by answering the following question: how does the racial and gender identity formation of college-aged women influence their political action(s)? Results build on parts of Harnois’ findings but challenge others. More specifically, women of color do not display an increased level of gendered political consciousness but instead a different, more racialized understanding of gender and gender inequality than white women. The study also considers implications for the study of intersectionality as well as the study of race and gender.

Devotional Music and Multifaith Encounter in a North Carolina Sikh Community

Styrling A. Rohr (Dr. Mussa Idris) Department of Sociology and Anthropology

Sikhism is a monotheistic religion founded on principles of equality, devotion, and courage that originated in Northern India. Sikh services today, both in India and in diaspora, mostly consist of *keertan*, singing and reciting the scripture in hymns. Drawing on nearly two years of ethnographic research with a Sikh community in North Carolina, this project investigates the role of Sikh sacred music in religious experience, Sikh-American identity, and the ways interfaith concerns impact everyday life. In contrast to much of the academic literature, which suggests that Sikh *keertan* functions as a pragmatic tool to teach Sikhs about their religion and culture, I found that *keertan* functions just as much as an expressive religious experience than as a tool. Additionally, I found that Sikhs in North Carolina, as part of a minority religious community, are especially concerned with issues of self-representation and educating non-Sikhs about their tradition, and that the interfaith themes which guided Sikhism’s initial formation continue to inform this community. This research directly engages with a local religious ethnic group that is not often studied academically and not often recognized by Americans as distinct. Sikhism remains especially understudied in the Southeast. The most concrete rationale for this research, however, lies in its capacity to foster relationships between a sidelined, local community and Elon’s academic community as well as more broadly among Sikhs and non-Sikhs. By demonstrating Sikh hospitality, illustrating the complexity of Sikh practices and devotional music, and sharing the stories and opinions of Sikh people, this research advances a larger goal of promoting a more nuanced, welcoming, and positive view of Sikhs in America today.

Mortuary Distribution in Spatial Context: An Intraregional Analysis of the Ancient Maya of Northwestern Belize

Autumn D. Rose (Dr. Rissa Trachman) Department of Sociology and Anthropology

Global Information Systems, or GIS, describes a series of software used to store and analyze spatial data. In the context of archaeological research, GIS has been used to process both human-made and natural features and all related variables for visual analysis across time and space. For this project, I will be using GIS to perform an intraregional analysis of ancient Maya mortuary information for the region of Northwestern Belize within its locational context. Relevant variables, including grave type, grave orientation, body orientation, body position, time period, sex, age, MNI (minimum number of individuals), burial artifacts and features, etc. will be input into the system for analysis. Data will be sourced from published documents written by

researchers within this area, as well as a dataset that I compiled in 2018 from the Dos Hombres archaeological site as part of a summer research project (9 burials, 20 individuals). Through this analysis, I would like to see if it is possible to ascertain new and distinct intraregional patterns, trends, or differences in ancient Maya burial practices through the visual component added by spatial analysis. This project would help to provide a better understanding of the distribution of various burials types and grave goods in larger context, and also explore whether GIS analysis is an effective method in conducting this type of study. In addition, this dataset will add to an ever-growing database of archaeological data within a single, digitized format, of which individual variables can be easily searched for and analyzed, providing geographically-referenced information for any number of future research projects within this region.

Gendered Attitudes Towards the Criminalization, Perpetration, and Victimization of Revenge Porn in the United States

Laura Suzanne Rossi (Dr. Rena Zito) Department of Sociology & Anthropology

Revenge porn, the non-consensual sharing of sexually explicit photos or videos, has been criminalized by 41 states, with most legislation implemented over the past several years. To date, little is known about general public attitudes towards revenge porn laws, including beliefs about harms to victims, perpetrator motivations, victim culpability, and criminal justice consequences. The present study analyzes in-depth interview data from 32 college students (16 men, 16 women) to examine these attitudes, focusing specifically on the ways in which gender—of the respondent, of the perpetrator, and of the victim—shapes perceptions. Despite support among respondents for criminalization of revenge porn, men's and women's attitudes diverge when assessing less extreme forms of the offense. Moreover, qualitative results lend support to feminist legal scholars' claims that victim-blaming permeates men's and women's attitudes towards revenge porn, regardless of continued support for criminalization. In addition, female victims are understood to suffer greater harm than male victims, and support for legal interventions for victims differed among male and female respondents. Both male and female respondents assumed victims to be females and perpetrators to be males, for instance, which plays into how gender is publicly perceived in regards to sexually-motivated crimes. This research contributes to our understanding of how those who are most likely to engage in and be victims of revenge porn (i.e., college-aged persons) think about this offense, including how it ought to be handled legally and socially.

Evaluating the Role of Resiliency in Preventing Student Burnout within Memoirs of Medical Education

Alyssa M. Schlenter (Dr. Alexis Franzese) Department of Sociology and Anthropology

Medical education exposes aspiring physicians to an exceedingly emotional and stressful training period. This training is designed to help students prepare for positions in the health care system and to become critical decision-makers for patients. Medical students with resiliency skills may be better able to endure the increasing demands of the health profession. Resiliency skills are the emotional tool set that allows individuals to respond and adjust to encountered difficulties. During medical school, trainees with the capacity for resiliency and ability to adapt in response to the overwhelming stress and fatigue seem primed for success later in their careers in terms of

their ability to provide quality care and develop meaningful relationships with patients. In order to evaluate how resiliency skills are embodied in medical students, this research employs an analysis of selected memoirs spanning from 1989 to 2016, which met inclusion criteria of being first-hand accounts of the medical school experience. Memoirs were authored by medical students and resident physicians as they confront the emotional challenges during medical education. Themes from these memoirs allude to the idea of a complex diversified sense of self-identity, contributing to the emotional defense strategies against medical school stress and burnout. These results align with Linville's self-complexity theory. Medical students that possess these additional self-identities during medical school are found to have elevated levels of resiliency skills, enabling improved success upon patient care during residency. While medical schools should be examining potential for reform to better prepare competent physicians, it would be advantageous for admissions to select students based on this type of criteria and skill set.

Sport Management

Does an Organizational Change Lead to a Coaching Change? The Impact of Reclassification to NCAA Division I on the Head Men's Basketball Coaching Position

Ryan J. Cranston (Dr. Tony Weaver) Department of Sport Management

Reclassification is the process by which a higher education institution makes a formal request to the National Collegiate Athletic Association (NCAA) for a change in division membership. Research has been done analyzing the impact of reclassification on the institution, athletic department, and specific sport programs, however, prior research on the impact of reclassification on basketball coaches is lacking, in particular related to coaching turnover (Frieder & Fulks, 2007). Therefore, the purpose of this study is to examine coaching trends at reclassified institutions, and the factors that affect coaching turnover. Data were collected from institutions that reclassified from Division II/III to Division I over the past 26 years (n=71). Archival records from websites were examined relating to the history of the basketball program and the background of the coach at the time of reclassification. Variables related to coaching tenure included coaching winning percentage at the reclassified institution, conference regular season and post-season tournament success, duration of tenure, previous and future jobs in coaching, and the reasoning for their departure. Descriptive statistics and t-tests were used to assess relationships between coaching success and turnover. Results indicated that coaches remain at the reclassified institution for an average of 4.9 seasons after the transition. Of the 71 institutions, almost 23% did not retain their coach prior to reclassification for even one season and almost 38% did not stay longer than two seasons. After season five, two-thirds of coaches who were employed at the time of the transition were no longer at the same institution. With regard to winning, coaches whose percentages are higher than .500 stay for an average of 6.4 years after transitioning to Division I, whereas when winning percentage is less than .500, coaches stay for an average of 3.5 years. This study shows that turnover is almost a direct byproduct of reclassification, but certain factors, such as winning percentage and duration of tenure, may blunt this. Because reclassified programs are more vulnerable to losing due to the jump in division and greater program demands this work provides valuable information for current and potential coaches considering reclassified institutions.

A Qualitative Analysis of the Intersectional Socialization of NCAA Division I Student-Athletes Across Diverse Identities

M. Serena Archer (Dr. Tony Weaver) Department of Sport Management

This research explores the socialization of NCAA Division I student-athletes through qualitative, in-depth case-study research methods to understand the influence of collegiate sport on interactions across intersectional identities. As institutions move toward increasing diversity on campus (Smith, 2015; Vos, 2016), the opportunity for cross-sectional socialization, particularly with student-athletes (Cunningham, 2007), is ample. However, other research posits that one of the great detriments of participating in collegiate athletics has been a lack of opportunity for social and personal development (Ready et. al., 2013; Singer, 2009) due to time constraints and the struggle with the dual-identity of student and athlete (Clayton et. al., 2015; Rubin, 2016). To address this dichotomy, the purpose of this research was to conduct an in depth-case study of an NCAA Division I football program and its influence on the socialization of student-athletes across intersectional identities, such as race and socio-economic class. Specifically, this research posed the following overarching question: *What is the influence of NCAA athletic participation on the socialization of student-athletes across diverse identities?* This study used qualitative, case study research methodology to give a voice to athletes typically categorized only by demographic descriptors (Beamon, 2008). Interviews lasting 30-45 minutes were conducted with student-athletes (n=21) and athletic staff (n=4) associated with an NCAA Division I football program at a predominantly white institution (PWI) in the southern United States. Thematic analysis revealed that the learned experiences of athletes based on their background in sport greatly influences their ability to socialize inside and outside of the athletic realm. Furthermore, identities such as race, economic class, and academic strength affect the formation of student-athletes' situational socialization. Finally, many interview participants suggested that athletic identity was the most prominent factor in the student-athletes' socialization habits. Overall, this case study suggests that the socialization of student athletes is complicated by their diverse, intersectional identities and often times requires them to fall into perceived situational identities depending on the social setting. By understanding the complex student-athlete experience and their patterns of socialization, athletic administrators and coaches can work to increase opportunities for student-athlete social and personal development on college campuses.

A Conceptual Model to Understand Environmentally Responsible Initiatives by North American Sport Teams and Perceptions of Sport Fans: The Belief-Attitude-Intention Hierarchy Approach

Collin W. Murray (Dr. Young Do Kim) Department of Sport Management

In recent years, "Going green movement has gained momentum in America society" (McCullough & Cunningham, 2010, p. 349). Indeed, North American sport organizations at professional and collegiate levels are actively involved in a variety of environmentally responsible initiatives (ERIs). Sport organizations make the best use of the influential culture and market of sports to promote a sustainable mindset and behavior among stakeholders. However, little is known about the underlying mechanisms of sport fan behavior responding to the ERIs. Given this gap in the literature, the purpose of this study was to develop a conceptual model that outlined the effects of ERIs implemented by sport organizations on sport consumer behavior. In

particular, we applied a belief-attitude-intention hierarchy model proposed by Madrigal (2001) to explain the process of how sport consumers' beliefs of a sport team's ERI investment lead to their pro-environmental behavior intentions. The proposed conceptual model articulated following three main relationships: (a) Sport teams' ERIs are positioned to positively influence sport fans' attitude toward sport organizations; (b) sport fans who hold favorable attitude toward the sport teams' ERIs are predicted to participate in pro-environmental behaviors; and (c) attitude plays a key mediating role between the sport fans' beliefs of the sport teams' ERI investment and their pro-environmental behavior intentions. The findings from this current study encourage more sport organizations to accelerate "going green movement" to benefit not only themselves but also our communities. The implications of these findings indicate that favorable beliefs about the benefits from pro-environmental behaviors and initiatives have a very positive impact on the community and overall sport consumer behavior. Furthermore, this has been linked positively to the ability that sport organizations have on consumers' beliefs in regards to the education of the benefits of the "going green movement".

A New Comprehensive Offensive Measurement: Total Achieved Bases (TABS) as an Evaluation Tool in Professional Baseball

Daniel Schiff (Dr. Mark Cryan) Department of Sport Management

Total Achieved Bases (TABS) is a statistic that uses basic recorded baseball statistics to measure the average production of bases per each plate appearance (PA). The statistic is a new statistic that allows teams to better predict their run production from a given player. TAB includes elements of on-base plus slugging (OPS) and weighted On Base Average (wOBA). The statistic is calculated based on any given PA a player has during a game. For the simplest example, if a player were to hit a home run during a PA, he would be given 4.000 total average bases because he touched all four bases. In OPS he would have 5.000 because it is 4.000 from SLG and 1.000 from OBP. Therefore, our new statistic blends OBP and SLG to account for shortcomings such as the fact that SLG doesn't count walks (BB) or hit by pitch (HBP). There are also some statistics included just for calculating TAB, such as ground into double play (GDIP) and stolen base (SB).

This new statistic may allow for the simplified understanding of the average bases a player received in each PA, game, stint, season, or career. The benefit of this statistic is that it helps us better understand how often a player will get on base in a PA and where he will end up during a plate appearance. Whether he scores once every plate appearance (4) or only gets on first base (1). We propose that this offers a better, fuller understanding of offensive value of a player than any existing single measure. The methods of calculating the statistics, applications, and strengths and limitations will be discussed and feedback will be welcomed.

Examination of Administration Positions within NCAA Division I Athletics Institutions: How Can Student-Athlete Well-Being Be Prioritized?

Brendan M. Thiry (Dr. Tony Weaver) Department of Sport Management

In recent years, there has been a transformation in the organizational structures of NCAA Division I athletic departments. This organizational shift is currently taking place due to the

emphasis of student-athlete well-being. At the forefront of this shift has been the creation of a full-time administrative position responsible for overseeing all components of a student-athlete's well-being including sports psychologists, athletic trainers, strength and conditioning coaches, and sports nutritionists (Vescovi, 2018). Data was collected from all 351 NCAA Division I athletics institutions to analyze how prevalent this administrative position is at institutions in Power 5 conferences (Big 12, Pac 12, Big 10, ACC, SEC) and non-Power 5 institutions as well as at the Football Bowl Subdivision (FBS), Football Championship Subdivision (FCS), and non-football levels. Additionally, the research gathered background information on the individuals who work in these positions to evaluate the general qualifications needed for this administrative position. Preliminary results have indicated that only about 24% (85 out of 351) of NCAA Division I institutions have a full-time administrative position with a holistic focus on student-athlete well-being. Furthermore, about 38% (24 out of 64) of Power 5 institutions employ this type of position, but only about 21% (61 out of 287) at the non-Power 5 institutions. Further analysis at the FBS, FCS, and non-football levels as well as the background information of the individuals are in progress. Ultimately, the results of this research will provide insight into the ways in which NCAA Division I institutions are following this current trend and how the NCAA can try to get all of their members to buy into this structural shift.

World Languages and Cultures

An Analysis of Maternal Relationships in Kim Thúy

Ally Bolton (Dr. Sarah Glasco & Dr. Olivia Choplin) Department of World Languages and Cultures

At the age of ten, Vietnamese-Québécois author Kim Thúy fled the violence of the Vietnam War and settled in Québec with her family. Thúy's narrators all follow trajectories that mirror her own, although their reasons for leaving their homeland vary. What surfaces in each iteration of this voyage is a depiction of migration as an opportunity for the reconstruction of personal and cultural identity. More intimately, Thúy's earlier novels *Ru* and *Mãn* imagine this remaking of the self as a kind of rebirth. Both of Thúy's Vietnamese narrators are mothered by Québécois women and the new land itself becomes a womb in which these migrants are nurtured: « La ville de Granby a été le ventre chaud qui nous a couvés durant notre première année au Canada. Les habitants de cette ville nous ont bercés un à un » (Thúy, 2009, p. 31). [The town of Granby was the warm womb in which we were coddled during our first year in Canada. The inhabitants of this town rocked us one by one.] Through close readings of *Ru* and *Mãn*, I will explore Thúy's representations of the maternal bond in the context of civil war, migration and the reconstruction of the self, as well as how these representations speak to experiences of migration described in psychoanalytic literature. Finally, I will consider how Thúy's representations of the psychic experiences of her narrators may reflect (past and present) global cultural power dynamics. This presentation will be in French.

Gods, Myths, and Men: Tensions between Philosophy and Religion in Cicero

Lucy T. Crenshaw (Dr. Kristina Meinking) Department of World Language and Cultures

Cicero (106-43BCE) was an accomplished orator, lawyer, statesman, and philosopher during the decline and subsequent fall of the Roman Republic. His varied roles provide a range of perspectives on Roman civic religion, which underwent an important development at this time as elite, educated Romans like Cicero wrestled with how to apply Greek philosophy about the nature of the divine to Roman religious praxis. For example, various Greek philosophical schools believed that the divine did not experience emotions, yet the mythology tied to Roman civic religion depicted the Roman gods experiencing lust. Cicero identified this tension between Greek philosophy and Roman religion and aimed to bring these two opposing ideas together into a coherent tradition. This goal, to integrate Roman religious culture and Greek philosophy, is essential to understanding Cicero's various philosophical works, the ways in which he engaged with the schools, and how his philosophy worked in relation to his roles in the Roman state. In this paper, I examine two of Cicero's philosophical texts on the nature of the divine and religion. In *De Natura Deorum*, three characters debate the nature of the gods based on the philosophies of Stoicism, Epicureanism, and Scepticism. In *De Divinatione*, two characters debate divination and augury, a foundational part of Roman state religious tradition. In these texts, the argument that is forefronted in each opposes the other, with *De Nat.* seeming to support the Stoic view, which aligns most closely with religious tradition, and *De Div.* seeming to support the Academic Sceptic view, which rejects divination and religious tradition. While many scholars are content to accept that we cannot make any conclusions about Cicero's true belief from these texts, I suggest that the purpose of these two opposing texts was not to provide any kind of conclusion to the issue of integrating Greek philosophy and Roman religion, nor to place one above the other. I argue instead that Cicero penned these works to illustrate his very inability to ease this struggle; we cannot conclude that he believed one thing or another from them because they were intended to make transparent the tension.

Ovid's *Tristia*: Exploring Ovidian Exile Poetry

Monroe Dzierisk (Dr. Kristina Meinking) Department of World Language and Cultures

The famous Roman poet Publius Ovidius Naso (43 BC - 18 CE) was known for his diverse poetic output during the reign of the emperor Augustus. Despite Ovid's public success, he was later banished by Augustus in 8 CE for a 'carmen et error' (a poem and a mistake), the nature of which remain elusive two thousand years later. Ovid was sent to Tomis (in modern-day Romania) where he wrote the *Tristia*, a five-book narrative of his despair while in exile and his longing to return to Rome. My research focuses on how Ovid creates an imagined audience for his work, that is, how he addresses a variety of possible readers and who he imagines his audience to be. For example, Book II is mainly addressed to Augustus. Ovid often compares Augustus as one who is watching over the empire to Jove, watching over gods and the high heavens. In III.11, he address an ambiguous recipient, begging them to stop attacking him as he is hardly the eminent person he used to be, but as a result of exile is rather a mere shadow of his former self. Though Book V is largely dedicated to his wife, he also pleads with the reader using second person address, imploring them to see to it that his work makes its way to Rome to be read. Even these few examples suggest the range of Ovid's addressees and the various ways in which he engages his audience; his treatment of recipients both named and anonymous (e.g. Augustus vs. an unnamed resident of Tomis) also serves to help Ovid frame his experience of exile. By analyzing these passages we can come to see the *Tristia*, collectively, as a way for Ovid to make himself present in Rome even while he is absent in Tomis. My reading of the *Tristia*

contributes to and furthers work on questions regarding the highly literary nature of the *Tristia*, how it is indicative of Ovid adopting a different persona and experimenting with another genre.

Marginalization in Bolivia: The Representation of the Indigenous in *También la lluvia* and *Yvy Maraey: Tierra sin mal*

Taylor R. Faust (Dr. Pablo Celis-Castillo) Department of World Languages and Cultures

The marginalization of the Bolivian indigenous population is shown in the movies *También la lluvia* (2010) and *Yvy Maraey: tierra sin mal* (2013) through the well-defined identities that are results of the stereotypes of and the lack of resources available to this group. These aspects of society represent the manifestation of the marginalization in the modern world. It is important to understand this manifestation in order to understand the modern social situation in Bolivia as a result of many years of discrimination. These indigenous groups that make up the majority in Bolivia have been the focus of much discrimination due to their indigenous roots since the time of Spanish colonialism. This project will analyze scenes in the movies that represent real situations of marginalization in Bolivia. These scenes represent reality for indigenous people in Bolivian society today because they are fictitious portrayals that illustrate daily life in Bolivia and can be viewed as credible reflections of this reality. Though the stories themselves are fiction, the situations they represent could easily be true, and thus provide insight into life for the indigenous in Bolivia. Through the analysis of these scenes, important themes have emerged such as: the economy, resources, identity and stereotypes. Within their storylines and dialogues, both *También la lluvia* and *Yvy Maraey: Tierra sin mal* show the ingrained identities and stereotyped attitudes of dominant groups in relation to indigenous people. Concurrently, there are representations of the lack of opportunities and resources, which is another aspect of the marginalization of the indigenous population. Additionally, the structure of the movies themselves is a representation of real marginalization that exists today in the coproduction system of film creation. Because both movies include the production of a movie within the plot, they serve as settings to display the attitudes of the dominant groups and interactions between indigenous and dominant groups.

The representation of Sexual Minorities in *La soberbia juventud*: An Evaluation of Discrimination in Post-Dictatorial Chile

Sofia Huster (Dr. Pablo Celis-Castillo) Department of World Languages and Cultures

The novel *La soberbia juventud* by Pablo Simonetti explores the life of a young homosexual man named Felipe Selden during the transitional period that reestablished democracy in Chile during the 1990s. Despite enjoying a democratic environment, the Chile of the novel still suffers from consequences of the dictatorship under Augusto Pinochet (1973-1990). Through the story of the protagonist, the novel demonstrates that the conservative values of Chilean society, particularly the emphasis on the Catholic religion, have created a hostile society towards sexual minorities. The novel demonstrates that the conservative and the Catholic friends and family of Felipe do not accept his sexual identity, believing instead that his preference is simply a phase (Simonetti, 2013). These individuals are representative of the traditional Chile of Pinochet that dismissed homosexuality as unnatural; it was not until after the establishment of democracy that homosexuality was depenalized in 1998 (Blanco, 2009). The lack of acceptance, discrimination

and prejudice by Felipe's family and friends, cause him to experience frequent exposure to external homophobia. This external homophobia creates an internalized homophobia in Felipe, making him believe that his identity is incorrect. Through analysis of the novel, it can be interpreted that members of the LGBTQ community are still marginalized in Chilean society. However, the novel suggests that slow progress is being made towards acceptance of this group. In the novel, Felipe is able to overcome his internalized homophobia—the struggle to accept his identity—through creating relationships with allies of the LGBTQ community. This is important as theorists Frost and Meyer describe that it is essential to overcome internalized homophobia to have a healthy self-concept (2009). Felipe's story serves as a model for how members of this minority group in Chilean society can overcome external and internal homophobia. The growing network of allies and advocacy movements enforce the concept of community, and promote identity development. In particular, the creation of the Homosexual Movement of Integration and Liberation (MOVILH) in 1991 began this process (Garrido and Barrientos, 2018). Moreover, the publication of the novel itself serves as a contribution to the representation of sexual minorities in Chile.

The Distinct Perspectives of Indigenous Marginalization in Bolivia through the Films *También la lluvia* and *Zona sur*

Mary E. Kempf (Dr. Pablo Celis-Castillo) Department of World Languages and Cultures

The majority of the Bolivian population is indigenous, but still the native populations are denied many basic human rights, specifically access to fresh water and fair wages (Aniorte y Cermeño 2018). The films *Zona sur* (2009) and *También la lluvia* (2010) reflect upon a class structure that is used to exploit indigenous communities in Bolivia and deny them these basic rights. I analyze how both films show a similar power structure, but there are different reactions to this hierarchy. Nevertheless, the indigenous are marginalized and suffer for the benefit of others in both films. *También la lluvia*, directed by filmmaker Icíar Bollaín, focuses on the lives of the indigenous communities, showing the quality of life and the problems that arise without access to fresh water. An indigenous man, Daniel, leads a resistance to this existing power structure throughout the film. In contrast, the film *Zona sur*, directed by Juan Carlos Valdivia, examines the life of an indigenous servant who lives with a wealthy family without any form of resistance. In an important scene, Wilson lacks the authority to demand pay for his services. The distinct scenarios of the two films examine the exploitation of the indigenous Bolivians both in the native communities and in the cities. A large multinational company exploits Daniel's community and abuses control of the fresh water. On the other hand, Wilson has access to hot water, but he does not have the power to demand fair treatment by the family. He sacrificed his livelihood and his land in his indigenous community in order to work in the home of the wealthy family, and now he is isolated from his village. When the mother refuses to pay him, he cannot resist because he lacks alternatives. For this reason, he will be a servant forever. Even though the issues Daniel and Wilson face are different, they are both marginalized by a higher power in the form of both a multinational company and the mother of the family. I argue that there are different reactions to this power structure: collective resistance or the passive servant.

The Marginalization of Nicaraguans in Costa Rica as Seen through *Princesas Rojas* and *El Nica*

Elizabeth S. McDonald (Dr. Pablo Celis-Castillo) Department of World Languages and Cultures

While Nicaragua and Costa Rica share a physical border, their complex history continues to cause problems for the Nicaraguan immigrant populations in Costa Rica. This project will investigate the film *Princesas Rojas*, a Costa Rica and Nicaragua film directed by Laura Astorga. It was released in 2013. Additionally, this project will investigate *El Nica*, which is a monologue written by Cesar Melendez in 2003. Both works uniquely exemplify the Nicaraguan immigrant experience in Costa Rica and the challenges which arise. The thesis of this work is that the character development and language in *Princesas Rojas* and *El Nica* demonstrate the literal and symbolic destruction of family relationships and the inevitable decline of the protagonists' mental health. However, the opportunities that Costa Rica can offer the characters and their families makes the experience worth it. For example, in *Princesas Rojas* the two daughters are given the opportunity to get an education in a safe environment, something nearly impossible in Nicaragua. Meanwhile, *El Nica* shows the economic opportunities of work that encourage many Nicaraguans to immigrate to Costa Rica. Despite the suffering and discrimination experienced by the characters in both works, immigrating to Costa Rica is a worthwhile experience because they gain opportunities they could never have otherwise. Both works give compelling stories of immigration, yet it's not an entirely unique situation to Costa Rica and Nicaragua. Immigration is a phenomena occurring all over the world, in a variety of different circumstances. It's important to explore immigrant experiences in order to identify possible areas for growth. In the media, immigrants are often misrepresented by stereotypes of laziness and violence. However, in the works of this project, immigrants are shown to play a vital role in the economy. The opportunities host countries can provide to immigrants creates a metaphorical intersection. Many countries must decide whether to close their borders or provide assistance to those in need. Additionally, they must consider what cost, mentally, physically and emotionally, these immigrants must pay in order to find a better life. *Princesas Rojas* and *El Nica* show these immigrant experiences, perhaps to inspire a change.

Le paradoxe du rôle de l'école dans l'école perdue de Tahar Ben Jelloun: Est-ce qu'on peut gagner et perdre en même temps ?

Martina Racioppi (Dr. Sarah Glasco) Department of World Languages and Cultures

Tahar Ben Jelloun is a Moroccan author who is most commonly known for his short novels. Examining these stories help the readers gain a crucial understanding of the child labor phenomena as well as the hardships of following through with education in Sub-Saharan Africa. This presentation will offer analysis of some of the stylistic devices that Ben Jelloun uses to highlight contemporary problems in the educational systems of Sub-Saharan Africa, problems that are often portrayed as "external. L'école perdue allows readers to better grasp the problems that may seem inaccessible to them, and bring them closer to the everyday lives of young African students. This analysis will also illuminate modern day violations in regards to child labor and education laws around the world. It is essential to understand how these problems are brought to the attention of readers in order to critique our own knowledge of them. I approached

this topic by conducting literature reviews of articles on Tahar Ben Jelloun's writing, as well as conducting in-depth analysis of the novel, and I discovered that the author utilized various tools, such as ambiguity of place, juxtaposition, and allusions, in order to convey the presence of child labor in the world. Tahar Ben Jelloun leaves the setting of the story ambiguous, and thus not restricting the readers to approaching the subject as existing in one place at one time. Furthermore, he creates metaphorical and physical juxtaposition throughout the story to enhance the differences between the stolen rights of the children. This presentation will be in French.

Ser cuidadora: mujeres mexicanas en *Real Women Have Curves* y *Como agua para chocolate* (Being a Caretaker: Mexican Women in *Real Women Have Curves* and *Como agua para chocolate*)

Katie A. Schneider (Dr. Pablo Celis-Castillo) Department of World Languages and Cultures

Real Women Have Curves (2002), directed by Patricia Cardoso and *Como agua para chocolate* (1992), directed by Alfonso Arau, explore the relationship between characters representative of Mexican mothers and daughters. In both films, we see the importance of the tradition to be a caretaker through the strong desires the mothers impress upon their daughters to fulfill it. These desires are oppressive and show the systematic marginalization experienced by the women in the films. Even though the daughters of the films experience negative effects in their life when they rebel from the tradition, it is women like them who are crucial to end the tradition. I explain that it is vital we understand the origins of the caretaker role for Mexican females because it oppresses women, and the eradication of female oppression should be a common goal of the global community. Starting from the ideas of Nancy LaGreca (2010) in her theoretical framework, "The Angel of the House," her female archetype says, "a woman's virtue is measured by her dedication to domestic life, self-sacrifice, and servitude to her family" (p. 3). Although LaGreca does not discuss the films specifically in her work, her theory can be applied to the analysis of the films. The mothers in the films treat their daughters as though they must obey this oppressive female model. Obedience to authority is further emphasized through the common ideal of paternalism, which Mexican culture has included for a long time. It refers to the idea that an authority figure has the best idea of what is good for an individual (Hietanen & Pick, 2015, p. 288-289). The mothers in the films assume the paternalistic figure in perpetuating the tradition of being a caretaker onto their daughters, believing that they have their daughters' best interest in mind. For many centuries, Mexican women have been told that this is the right path for a woman. The mothers in the films want their daughters to share in the caretaker tradition and further it to the next generation because it is what they know to be suitable for a woman.

Revolutionary Women in the Ancient World: The Memorialization of Powerful Women during the Roman Empire

Emily C. Ternent (Dr. Kristina Meinking) Department of World Language and Cultures

How did ancient historians record the lives of women who failed to conform to traditional gender roles? Women in the ancient world are typically believed to have been confined to the domestic sphere and wholly subservient to their fathers or husbands. We know, however, that there is evidence of some women challenging these expectations and claiming power for themselves. In order to determine how ancient historians responded to women in positions of power, this project

examines primary sources on three different women from the first century B.C.E. to the third century C.E.: Fulvia, the wife of Marc Antony, the Celtic queen Boudicca, and the Palmyran queen Zenobia. These women were chosen for this study based on the unique level of power each of them wielded; they each raised armies and rebelled against the power of the Roman Empire. The acknowledgment by ancient historians that these rebellions were organized and led by women is unusual when considering the submissive role they were expected to take in society.

In light of the distrust of powerful females that typically emerges in the ancient, male-driven discourse, the rhetoric used to describe Zenobia in the late-antique historical work *Historia Augusta* breaks from this mold. The author of this work includes positive discussion of Emperor Claudius Gothicus' decision to entrust the Eastern portion of the Empire to Zenobia's rule. Why was a woman considered competent enough to rule over a section of the Empire? Why did ancient historians choose to commemorate this and acknowledge a woman as wielding real power and influence? In this presentation, I will discuss my analysis of the language used to describe these three women who each managed to rally armies to fight against the Roman Empire. Some elements of this discussion include the idea of being "Roman," the perceptions of foreign women, the potential political bias of these sources, and the theory of women existing as space for male action in ancient literature. Ultimately, I claim that recognition of a woman with autonomous power in ancient literature occurs only to the extent that they affected their male counterparts.

Imperial Ambitions: The Manufactured Inheritance from Rome to Britain

Kyle D. Thomas (Dr. Kristina Meinking) Department of World Language and Cultures

As the United Kingdom built its globe-spanning empire in the 18th-20th centuries, its architects, proponents, and critics looked to Ancient Rome for inspiration, direction, and warning; although their interpretations of Roman imperialism differed, almost all perceived an ideological connection between themselves and the Romans. My research focuses on that connection, and whether or not the British genuinely inherited some ideas or modeled some practices regarding expansion and imperialism from the Romans. My broader argument is that this link was not a genuine inheritance of ideas and practices, but a purely ideological connection manufactured by British thinkers; for the purposes of this paper, my argument will focus on demonstrating that British imperialist practices were not meaningfully modeled after those of the Romans. Specifically, the methods and motivations of conquest and administration of empire employed by the British shared no more than superficial similarities with those of the Romans, based on the words and accounts of both groups by their contemporaries. These findings lend more nuance to the scholarly conversation in the field of Classical Reception, challenging the persistent notion of European empires having inherited the imperial legacy of Rome.

Modernizing Magical Realism

Isabel R. Treanor (Dr. Ketevan Kupatadze) Department of World Languages and Cultures

This research is a literary based exploration of sociopolitical themes visible in the pages of Chilean novels and in the streets of present-day Santiago de Chile. It seeks to answer the

questions “do the sociopolitical messages of the authors who wrote using the literary technique of magical realism still resonate with the contemporary Chilean public? And does their use of the technique hinder or help their message?” While the term “magical realism” often refers to the larger literary movement, which draws criticism for mystifying Latin America in the eyes of Western audiences, this research explores a more direct application of the term. Unlike other studies, this investigation examines magical realism through the eyes of an internal, Chilean audience instead of an external one. The parallels between the authors’ themes and current sociopolitical issues that Chileans face “modernize” the selected authors’ works for this internal audience. The research methodology included an in-depth analysis of the works of four different Chilean authors, three that utilized the technique of magical realism, José Donoso, Isabel Allende, and Roberto Bolaño, and a fourth more contemporary author whose writing is a reaction against this technique, Alberto Fuguet. The analyses of these works were further informed by critics of the authors and experts in this literary field. In addition, Chileans in university settings were surveyed on their own existing biases, their knowledge of the literary technique of magical realism, and their reaction to the individual works by one of more of the four authors studied. Finally, samples of each of the novels were also compared to themes derived from protest art captured during my semester abroad in the Spring of 2018. The conclusions of the investigation point to an undeniable contemporary relevance of the works by all the authors studied. The evidence regarding the use of the technique of magical realism is less conclusive in terms of its effects on reader interpretation and understanding. However, a potential correlation between Chilean students who often read works with strong sociopolitical themes may indicate a higher likelihood to actively participate in the social movements occurring in Santiago presently.

The Functional Roles of Zeus and Jupiter: Differences in Societal Needs and Values

Katherine R. Westover (Dr. Kristina Meinking) Department of World Language and Cultures

Greek and Roman gods are constantly viewed as mirror images of each other by modern people, despite belonging to two distinctly different societies. The Roman gods are seen as slightly updated versions of the Greek gods, especially the Olympian gods. Identifying the differences between the gods, and how these differences are reflected in their society, is important for gaining an understanding of the uniqueness inherent to the Romans and Greeks which contributed to their distinct cultural identities. This research works to articulate how the Greeks and Romans perceived their supreme deities, Zeus and Jupiter respectively, and how these deities functioned within their societies. Specifically, it analyzes the appearances of Zeus and Jupiter within epic. In this paper I explore how Jupiter acted as a specifically Roman god, while Zeus had a far more universal nature, as well as how the interactions between the gods and their mortal followers were indicative of different identities. This research uses both primary sources, including direct translations of carefully selected sections from *Aeneid*, and secondary sources to closely analyze Zeus and Jupiter. This project shows that Zeus’ roles were much more varied than Jupiter’s, whose role to bring control reflects a larger concern with order prevalent throughout Roman civilization. Jupiter was a distinctly Roman figure with whom individuals could interact and make contracts, whereas Zeus’ roles were more universal and less defined. This research contributes to the larger question of not only how a culture defines its divinities, but also how the divinities define the culture.