



Spring Undergraduate Research Forum

Welcome to SURF 2018

The 25th 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 208 presentations, including an interdisciplinary symposium named South Asia in Motion; South Asia in Transition. Three 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
Dr. Eric Hall	Dr. Chris Richardson
Prof. Joel Hollingsworth	Dr. Paula Rosinski
Prof. Erin Hone	Dr. David Vandermast
Dr. Tonmoy Islam	Prof. Bill Webb
Dr. India Johnson	Dr. Meredith Allison (Director)
Dr. Ryan Kirk	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.

PROGRAM LISTING BY SESSION AND TIME			
<u>Poster Session I</u> (9am-10:20am)		4	
<u>Oral Presentation Session I</u> (10:30am-12:10pm)			
McKinnon D	11	Moseley 215	13
McKinnon E	11	Isabella Cannon Room	13
McKinnon F	11	Global Commons 103	13
Lakeside 212	12	Yeager Recital Hall	14
Lakeside 213	12		
Lakeside 214	12		
<u>Oral Presentation Session II</u> (1pm – 2:40pm)			
McKinnon D	15	Moseley 215	17
McKinnon E	15	Isabella Cannon Room	17
McKinnon F	15	Global Commons 103	17
Lakeside 212	16		
Lakeside 213	16		
Lakeside 214	16		
<u>Oral Presentation Session III</u> (2:50pm – 4:30pm)			
McKinnon D	18	Moseley 215	20
McKinnon E	18	Isabella Cannon Room	20
McKinnon F	18	Global Commons 103	20
Lakeside 212	19		
Lakeside 213	19		
Lakeside 214	19		
<u>Poster Session II</u> (4:10pm-5:30pm)		7	

ABSTRACTS BY DEPARTMENT/PROGRAM			
<u>Accounting</u>	25	<u>Management & Entrepreneurship</u>	90
<u>Biology</u>	26	<u>Marketing & International Business</u>	91
<u>Chemistry</u>	34	<u>Mathematics & Statistics</u>	93
<u>Communications</u>	40	<u>Music</u>	100
<u>Computing Sciences</u>	45	<u>Performing Arts</u>	102
<u>Economics</u>	48	<u>Physical Therapy Education</u>	104
<u>Education</u>	53	<u>Physics</u>	106
<u>English</u>	61	<u>Political Science & Policy Studies</u>	108
<u>Environmental Studies</u>	66	<u>Psychology</u>	111
<u>Exercise Science</u>	67	<u>Public Health Studies</u>	122
<u>Finance</u>	80	<u>Religious Studies</u>	127
<u>History & Geography</u>	83	<u>Sociology & Anthropology</u>	132
<u>Human Service Studies</u>	86	<u>Sport Management</u>	136
<u>International & Global Studies</u>	89	<u>World Languages & Cultures</u>	138

Poster Session I (9am-10:20am)

The Great Hall, Global Commons

Poster #	
S1	Daniel C. Conley Dr. Rissa Trachman Investigating Market Activity at the Ancient Maya Site of Dos Hombres
S2	Julianne J. DeBellis Dr. Tonya Train The Effect of Cucurbitacin B on Neuroblastoma Cells
S3	Sarah Boggins & Todd Luxton Dr. Justin Clar Quantifying Nanoparticle Release from Surface Coatings
S4	Claire E. Dollen Prof. Phillip Motley Perspectives on Typographic Design
S5	Sarah A. Hennenkamp Prof. Joel Hollingsworth Solar Flowers
S6	Kaitlyn Walsh, Alexis Betsock, & Rachel Wilson Dr. Victoria Del Gaizo Moore & Dr. Mary McManamy Bcl-2 Family Proteins as Drug Targets: Can Prostate Cancer Be Primed for Apoptosis?
S7	Abigail Corrigan Prof. Renay Aumiller Iceberg Theory: Translating Hemingway's Iceberg Theory into a Choreographic Technique
S8	Samantha J. Collins Dr. Joan Barnatt Taking a Global Perspective: A Case Study of an International Teacher
S9	Rachel E. Cole Dr. Julia Bleakney Evaluating and Improving First Year Awareness of, Attitudes towards, and Accessibility to the Elon Writing Center
S10	Brigid M. Brennan Dr. Caroline Ketcham & Dr. Eric Hall Academic Confidence and Grit Predict Mindfulness in Collegiate Student-Athletes
S11	Anna M. Linsz Prof. Elizabeth Bailey The Impact of a Mentor Based Program on Self Esteem and Perceived Body Image in Older Elementary School Girls
S12	Sam Cryan, Anna Altmann, & Maddie Touchette * Dr. Chad Awtrey Galois Groups of Doubly Even Octic Polynomials
S13	Marc M. Gibson Dr. Jennifer Uno Differences in Microbiota Profiles between Elon University Athletes and Non-Athletes
S14	Keely M. Collins Dr. Svetlana Nepocatych & Dr. Titch Madzima The Effects of Caffeine on Sugar Intake, Taste Perception, and Metabolism
S15	Bridget Krol, Sarah McCain, Ashley Moats, & Francesca Music Dr. Cynthia Fair & Dr. Caroline Ketcham Availability and Accessibility of Psychosocial Service Information on Websites of Top-Rated Children's Cancer Hospitals

S16	Juliet D. Goodman Measuring Ranking Distances	Dr. Todd Lee
S17	Tenley Brainard, Madeline Davis, Jessica Burchett, & Annamaria Sotolongo What's in a Word? Identifying Emotional Frames of Words Associated with Feminism	Dr. Kimberly Epting
S18	Grace B. Flink Incorporation of Contemplative Practices in Higher Education: Faculty Perspectives	Dr. Alexis Franzese
S19	Lydia R. Laws Characteristics of the Division I Athletic Director	Dr. Anthony Weaver
S20	Matt Sears Investigating the Contexts and Functions of Multimodal Communication in Neotropical Katydid	Dr. Jennifer Hamel
S21	Olivia M. Brand, Clare L. Shaffer, & Megan E. Herdt Measuring Schizophrenia Stigmatized Beliefs after Cultivating Compassion	Dr. Rachel Force & Dr. Catherine King
S22	Henry D. Davis Magnetic Thin Film Deposition and Analysis Using Magneto-Optic Kerr Effect (MOKE)	Dr. Kyle Altmann
S23	Sara E. Corning Perspectives of Parents and Volunteers of Special Needs Children in Youth Sport Programs: Striking Down Barriers	Dr. Caroline Ketcham & Dr. Eric Hall
S24	Marlies R. Emmelot The Right Book for the Right Student at the Right Time: The Role of Gender Boundaries in Book Choices among Children	Dr. Julie Justice
S25	Sarah Carpenter & Rachel Cockrell Allies for Equality in STEM: Endorsing a White Male Scientist as an Ally for White Women	Dr. India Johnson
S26	Erin Armstrong Investigating the Effects of Stereochemistry on the Cyclization of the Renewable Sugar Sorbitol Using B(C ₆ F ₅) ₃ as Catalyst	Dr. Jennifer Dabrowski
S27	Mary Ellen Kempf An Analysis of the Yoga Journal's Presentation of "The Yoga Body" from 1975-2017	Dr. Julie Lellis
S28	Sydney P. Nelson Comparing Forward and Backward Walking in Older Adults	Dr. Srikant Vallabhajosula
S29	Hannah R. Franklin-Gillette After-School Science: Promoting Girls' Science Identity Development	Dr. Mark Enfield
S30	Jessica L. Mohr Donald Trump's Twitter Rhetoric during the Russia Investigation	Dr. Jessie Moore
S31	Kira G. Oberle Dual-Task Performance after Cerebellar Transcranial Direct Current Stimulation	Dr. Caroline Ketcham
S32	Ashanti Desauguste & Samira Foster One Size May Not Fit All: Investigating How the Intersection of Race, Gender, and Stigma Consciousness Predicts Effective Role Models for Black Female Students	Dr. India Johnson
S33	Virginia E. Little Teachers of Color and the Achievement Gap: A View from Black Students	Dr. Cherrel Miller-Dyce

S34	Meg A. Hinate, Shelby Akers, & Aidan Dyer Nonprofit Organizations and Social Media: Impact on Volunteer Outcomes	Dr. Erika Lopina
S35	Sarah A. Brown The Aggregation of Amyloid Beta and Insulin Peptides	Dr. Kathryn Matera
S36	Katie C. Meier Adventure Based Learning and the Positive Influences on Mental Illness	Dr. Carol Smith
S37	Ilana Fitzpatrick & Kacie Lynch iAct: An Active Bystander Program	Dr. Carmen Monico & Ms. Becca Bishopric Patterson
S38	Kamberly L. Terry Effects of Morphology on Sprint Speed of <i>Urosaurus graciosus</i> Lizards	Dr. Gregory Haenel

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

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

Poster #	
S1	Kristine N. English Dr. Julie Justice Globalism in Literacy Utilizing Technology through the Global Read Aloud Project
S2	Sophia S. Tesluk Dr. David Vandermast Soil Characteristics and Abundances of Seeded Prairie Species in Central North Carolina
S3	Mathilde Martin Dr. Jennifer Zinchuk Who Brands the World? Girls! How Female Artists Must Manage Their Brand to Be Successful
S4	Nicholas G. Ciolkowski Dr. Jennifer Dabrowski Synthesis of Organovanadium Complexes as Antibiotic Analogues
S5	Margaret J. Malone Dr. William Moner A Comparison of the Expression of Religion on Social Media by Religious and Unaffiliated Individuals
S6	Brian A. Duffy Prof. Clay Stevenson Subconscious Memory and Replication of Popular Music through Musical Key and Tempo Accuracy
S7	Caroline C. Bowen Dr. Julie Justice The Right Book for the Right Student at the Right Time: Comparing Students' Choices between Narrative and Informational Texts
S8	Emily P. Keller Dr. Caroline Ketcham The Effects of Transcranial Direct Current Stimulation on Age and Race Implicit Association Tests During Complex Motor Tasks
S9	Alejandra H. Paull Dr. Carmen Monico Global Model of Practicum Student Instruction through Guatemalan Partnerships
S10	Maddie J. Jaudon Dr. Aaron Trocki Documenting Students' Perceptions of Incorporating History into Calculus Courses
S11	Bridget Krol, Sarah McCain, Ashley Moats, & Francesca Music Dr. Cynthia Fair & Dr. Caroline Ketcham Translating Psychosocial Standards of Care into Assessment: A Tool for Advocacy
S12	Alexis N. Hirvo Dr. Katie King Career Directedness in Community College Students
S13	Megan L. Graves Dr. Alexis Franzese Family Choices and Autism: An Examination of How Raising a Child with Autism Spectrum Disorder Impacts Family Completion
S14	Ryan A. Spaulding Dr. Young Do Kim CAA Basketball Analytics: Performance Indicators of Winning
S15	Samira A. Foster & Ashanti R. Desauguste Dr. India Johnson "It's Not What You Say, But What You Do": Allyship as a Tool to Attract Black Women to STEM
S16	Julia L. Needham Dr. Amanda Chunco Patterns in Hybridization Between Native and Invasive Species

S17	Jennifer A. Kane Activation of Renewable Sugars by Allyltrimethylsilane-Tris(pentafluorophenyl)borane Catalysis	Dr. Jennifer Dabrowski
S18	Sydney N. Brown Evaluating the Effectiveness of Applying Grief-Response Models to Sport Injury in Collegiate Student-Athletes	Dr. Eric Hall
S19	Andrew J. Scott Using Analytics to Assess the AltGov vs. Official Government on Twitter	Dr. Amanda Sturgill
S20	Courtney N. Kobos Looking Beyond the Classroom: Responding to Educator Needs in Linguistically Diverse Schools	Dr. Jennifer Zinchuk
S21	Alexis M. Williams The White Gaze on "Black Theatre": How the Perception of the White Mainstream Reinforces the Reproduction of Minstrelsy on Broadway	Dr. Scott Proudfit
S22	Caroline A. Kelly Test Setting and ADHD Influence Baseline Concussion Testing Neurocognitive Performance in Collegiate Student-Athletes	Dr. Caroline Ketcham & Dr. Eric Hall
S23	Joseph B. Keating Utilizing Twitter to Predict Stock Market Trends	Dr. Crista Arangala
S24	Miranda C. Rogliano The Influence of Family Systems Theory Obesity Treatment on Adolescents' and Parents' Perspectives of Family Dynamics	Dr. Cynthia Fair
S25	Ashley S. Howard & Laura E. Bernstein The Role of Corrective Feedback in Memory for Contextual Details	Dr. Amy Overman
S26	Emma J. Lavandosky Terrestrial Snail Response to Substrate Vibration According to Physical Orientation	Dr. Eric Bauer
S27	Lauren M. Ventresca More Than Learning Spanish: Teaching Students with Autism Spanish Using Technology	Dr. Stephen Byrd
S28	Meghan E. Peterson & Tanner Pinheiro Flavonoidic Composition of Poplar and Sourwood Honey	Dr. Eugene Grimley & Dr. Karl Sienerth
S29	Lyndsay J. Lee The Effect of Blueberry Supplementation on Exercise-Induced Muscle Damage and Inflammation	Dr. Paul Miller & Dr. Titch Madzima
S30	Hope J. Kase Preschoolers' Social Perspective Taking, Storytelling, and Art	Dr. Maureen Vandermaas-Peeler
S31	Madison A. Sowards Understanding Deception: An Exploration of Inauthenticity as a Form of Deceptive Communication	Dr. Alexis Franzese
S32	Christian L. Wagner Analysis of NC Public School Education Funding	Dr. Kirsten Doehler
S33	Tucker H. Schweickart Development of Pharmaceutical Precursors from Six-carbon Sugars	Dr. Jennifer Dabrowski
S34	Benjamin I. Maloney School Choice: Do We Have the Evidence to Justify Federal Policy Reform?	Dr. Betty Morgan

S35	Basile L. Terrier Entrepreneurial Failure: Reasons, Lessons Learned and the Case for Re-purposing Failed Start-up Ideas.	Dr. Elena Kennedy
S36	Alex E. Merritt & Leigh A. Pollard It's Not You, It's Your Job: The influence of Job Type on Perceptions of Older Workers	Dr. Erika Lopina
S37	Brandi D. Williams Examining the Negative Repetition Effect in Older Adults	Dr. Amy Overman
S38	Perry J. Elyaderani Depression, Anxiety and Suicidality of College Students - A Leadership Prize Project	Dr. Alexis Franzese
S39	Alina K. M. Iwan A Comparative Study of Vibrational Communication in Neotropical Katydid	Dr. Jennifer Hamel
S40	Clare L. Shaffer & Olivia Brand tDCS and the ERP Waveform: Behavioral and Neurological Modulation	Dr. Rachel Force
S41	Caroline A. Petitti The Impact of Chronic Obstructive Pulmonary Disease on Bone Density, Postural Control, Falling, and Activities of Daily Life	Dr. Srikant Vallabhajosula
S42	Emma C. Mutascio College Students' Perspectives on Special Education in their Families	Dr. Stephen Byrd
S43	Meg A. Hinote Spelling Bee: A New York Times Word Game Gone Mobile	Dr. Joel Hollingsworth
S44	Annie Yang Iron Welding Fumes: Human Health Consequences and Potential Beneficial Reuse	Dr. Justin Clar
S45	Emma E. Pippert The Impact of Promoting Positive Body Image on Academic Performance in Adolescent Girls	Prof. Elizabeth Bailey
S46	Patrick Snowden & Tess Walker Decision-Making Factors in Charitable Giving: Effects of Linguistic Framing on Likelihood and Amount of Donation	Dr. Kimberly Epting
S47	M. Bear Tosé The Influence of Participatory Budgeting Initiatives on Civic Engagement and Political Efficacy	Dr. Jessica Carew
S48	Peter K. Komlofske Cyclic Polynomials of Degree p^2 and p^3	Dr. Chad Awtrey
S49	Melanie N. Vacchiano Using a Design Thinking Approach to Target Geriatric Mobility at Twin Lakes Community	Dr. Matthew Wittstein
S50	Cassidy M. Neuman Research and Development of a Safe Rides Web Application	Dr. David Powell
S51	Corinne M. Kenny Integration of a Complex Balance Task into a Concussion Management Protocol Specific to Dancers	Prof. Lauren Kearns, Dr. Caroline Ketcham, & Dr. Eric Hall
S52	Allie Roth Understanding Adolescents' Perspectives of their Middle School Experience	Prof. Marna Winter

S53	Samantha E. Perry Dr. Cynthia Fair Insiders, Outsiders, and Intermediaries: Village Health Teams' Negotiation of Roles to Provide High Quality HIV Care in Nakaseke, Uganda
S54	Janae Williams & Christian Reese Dr. Chad Awtrey Counting p-power Extensions of the p-adic Numbers
S55	Kayla S. Pieri Dr. Benjamin Evans Design and Fabrication of Chained-particle Magnetic Composites for Biomedical Applications

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Oral Presentation Session I (10:30am-12:10pm)		
McKinnon D (Moderator: Sven Carlstrom) [Dr. Janet MacFall]		
10:30 am	Sarah A. Clark Assessing the Effect of Citizen Science on the Environmental Attitudes of Participants	Dr. Janet MacFall
10:50 am	Mariana K. Kneppers A Comparison of Salinity-Induced Thermoprotection of Photosystem II in Three Coastal Wetland Plants	Dr. Brant Touchette
11:10 am	Kate Pearce Examining the Impacts of Hurricane Sandy on Geographic Areas with Different Social, Economic, and Physical Attributes -- Case Study of Ocean County, NJ and Bergen County, NJ	Dr. Honglin Xiao
11:30 am	Paige E. Cunningham Sport Teams as Sustainable Assets in Our Communities: Proenvironmental (Green) Initiatives in North American Professional Sport Leagues	Dr. Young Do Kim
McKinnon E (Moderator: Jacob Crouse) [Dr. Ryne VanKrevelen]		
10:30 am	Nicholas Hadgis Classifying Eisenstein Polynomials of Degree 2p	Dr. Chad Awtrey
10:50 am	Kiley E. Shannon Symmetries of Degree 8 Polynomials	Dr. Chad Awtrey
11:10 am	Alonzo Cee Modeling Salaries of Major League Baseball Players	Dr. Ryne VanKrevelen
11:30 am	Benjamin P. Rogers Predicting End of Year MLB Team Records with Confidence Intervals	Dr. Ryne VanKrevelen
McKinnon F (Moderator: Joshua Cadorette) [Dr. Katy Rouse]		
10:30 am	Amanda N. Feldman Are Prisons the New Asylums? A look at Transinstitutionalization in New York State	Dr. Steven Bednar
10:50 am	Matt Furlong How Presidential Elections Influence Gun sales	Dr. Brooks Depro
11:10 am	Brooke A. Hunziker Healthy Body, Healthy Mind: The Effect of Child Body Weight on Academic Achievement.	Dr. Katy Rouse
11:30 am	Sean Webber Migration and Educational Outcomes	Dr. Brooks Depro
11:50 am	Stephan Marsh Changes in School Start Times and Teen Traffic Fatalities	Dr. Andrew Greenland

Lakeside 212 (Moderator: Dominic Willoughby) [Dr. Eric Hall]		
10:30 am	Ian R. Heaton Examination of the Availability and Effectiveness of Social Support Systems Following a Concussion in Collegiate Student-Athletes and Dancers	Dr. Eric Hall & Dr. Caroline Ketcham
10:50 am	Meagan H. Richardson Weight Perception, Body Composition, and Dietary Practices in College Age Students	Dr. Svetlana Neopcatych & Dr. Titch Madzima
11:10 am	Daniel J. Cavaretta Machines versus Free Weights: Does Exercise Mode Influence the Psychological Responses?	Dr. Walter Bixby & Dr. Eric Hall
Lakeside 213 (Moderator: Elana Kaplan) [Dr. Amy Overman]		
10:30 am	Kaylee Bodner, Madison Riley, & Jessica Hochschuler Potential Cognitive-Enhancing Effects of Oral Phosphatidylserine in Middle-Age Adults	Dr. Mathew Gendle
10:50 am	Joanna M. Salerno, Kayla E. McGraw, M. Andrew Rowley, & Alexandra P. Giglio Neural Activation Related to Successful Memory Retrieval	Dr. Amy Overman
11:10 am	Alicia M. Paul Anxiety Management on Campus: An Evaluation of a Mobile Health Intervention	Dr. CJ Fleming
11:30 am	Caroline D. Dean Risk and Resilience: A Cross Cultural Analysis of Parents' Beliefs about Children's Play and Experiences in the Natural World	Dr. Maureen Vandermaas-Peeler
11:50 am	Lauren E. Westerberg The 100 languages of Children: Inquiry in a Reggio Emilia-inspired Preschool	Dr. Maureen Vandermaas-Peeler
Lakeside 214 (Moderator: Mary Emmerling) [Dr. Megan Isaac]		
10:30 am	Natalia Conte Thinking Like a Feminist: A Study on Persona Poetry and Subversive Women Throughout the Course of the Feminist Movement	Dr. Janet Warman & Dr. Kevin Bourque
10:50 am	Emily G. DeMaioNewton From Shame to Empathy: Why We Need Stories to Survive	Prof. Drew Perry
11:10 am	Nicole Galante "We Create Our Own Reality": The Nuances of Power, Mental Health, and Reality in Young Adult Literature	Dr. Megan Isaac

11:30 am	Molly Y. Spero Some Boys Speak Up: The Function of the Male Love Interest in Young Adult Rape Novels	Dr. Jean Schwind
11:50 am	Alexis M. Williams Til Death Do Us Part: A Feminist Analysis of Ama Ata Aidoo's <i>Anowa</i>	Dr. Prudence Layne
Moseley 215 (Moderator: Dr. Meredith Allison)		
10:30 am	Carly Goldstein Defunding Terror: Targeting al-Qaeda's Finances	Dr. Ariela Marcus-Sells
10:50 am	Jourdan B. Parham Cybersecurity and the Vulnerability of VPNs in Contemporary China	Dr. Honglin Xiao & Dr. Xiaolin Duan
11:10 am	Courtney L. McKelvey Immigration and Identity: A Comparative Analysis of News Coverage in Sweden and Denmark	Dr. Glenn Scott
Isabella Cannon Room (Moderator: Robert Vanderzee) [Dr. Benjamin Evans]		
10:30 am	Joseph R. Paturzo Chained Particle for Enhanced Control over Magnetoactive Elastomers	Dr. Benjamin Evans
10:50 am	Sam Jenkins Investigating the Temperature Problem in High Temperature Emission Line Galaxies	Dr. Chris Richardson
11:10 am	Michael H. Dryzer & Caitlin Niven Deactivation of Nematode Eggs in Wastewater for Parasitic Disease Mitigation	Dr. Scott Wolter
Global Commons 103 (Moderator: Anna Cosentino) [Dr. Derek Lackaff]		
10:30 am	Lauren Duncan Producing Dance Film: Identifying Unique Traits of Dance Films Not Present in Traditional Live Performance	Dr. Richard Landesberg
10:50 am	Eliza Mosbarger The Intersectionality of Girl Power: The Framing of Feminism in Teen Magazines	Dr. Naeemah Clark
11:10 am	Alexandra Roat & Melissa R. Douglas Global Internet Technologists and Innovators Share Fears and Hopes for the Future of Communication Technologies	Prof. Janna Anderson & Dr. David Bockino
11:30 am	Anna M. Zwingelberg Perceiving the Black Box: Understanding Trust in Algorithms	Dr. Derek Lackaff
11:50 am	Jensen Collins Society and The Evolution of Media Coverage of School Shootings	Dr. Rena Zito

Yeager Recital Hall (Moderator: Allison Ivan & Taylor Cassidy) [Prof. Jennifer Guy Metcalf]		
10:30 am	Rachel C. Hopkins Sounds of the Screen: Discovering, analyzing, and applying trends in film score from 1985-2017	Prof. Clay Stevenson
10:50 am	Jason Dunn How Parliament-Funkadelic's Lyricism and Musicality Influenced Hip Hop	Prof. Joseph Noelliste
11:10 am	Tara M. Patterson National Stage Manager Survey, 6th edition	Prof. David McGraw
11:30 am	Alexandra K. Fung Intersecting Dance, Design, and Multimedia in Live Performance	Prof. Jennifer Guy Metcalf
11:50 am	Minnie Lane Patterns in 21st Century Dance Criticism	Prof. Renay Aumiller

Oral Presentation Session II (1pm-2:40pm)		
McKinnon D (Moderator: Sydney Solomon) [Dr. Jennifer Hamel]		
1:00 pm	Ellen Montgomery Snail Sensitivity to Vibrations	Dr. Eric Bauer
1:20 pm	Matt Sears Investigating the Reproductive Outcomes of Prolonged Copulations in <i>Anasa tristis</i>	Dr. Jennifer Hamel
1:40 pm	Lucas R. Hale Elon University Forest 2017 Breeding Bird Survey	Dr. Dave Gammon
2:00 pm	Breanna Coughlin Examining Treehopper Maternal Vibrational Signals During Simulated Predator Attacks	Dr. Jennifer Hamel
McKinnon E (Moderator: Lauren McMahon) [Dr. Karen Yokley]		
1:00 pm	Sabrina N. Campelo A Sensitivity Analysis on a Model of Dengue Fever Focusing on How Time Spent in Neighboring Areas Affects the Basic Reproduction Number	Dr. Karen Yokley
1:20 pm	Alexandra N. Grasz The Mathematical Modeling of Dengue Fever and Its Economic Impact to a Socialist Country, with a Specific Focus on Sri Lanka	Dr. Karen Yokley
1:40 pm	Matthew C. Laing Continued Investigations on Ventilation Equation Structure in Physiologically Based Pharmacokinetic (PBPK) Modeling of Inhaled Toxicants	Dr. Karen Yokley
2:00 pm	Alexis Padula Comparison and Analysis of a Ranking Method Using Embedded Tournaments in a Regular Season	Dr. Todd Lee
2:20 pm	Timothy J. Gaetani The Tale of Two Ratings Systems	Dr. Todd Lee
McKinnon F (Moderator: Sophie Scharrer) [Dr. Brandon Sheridan]		
1:00 pm	Christian Reese The Relationship Between Income Inequality and Life Expectancy	Dr. Mark Kurt
1:20 pm	Austin Martin Exploring the Effect of International Wage Differences on Brain Drain	Dr. Brandon Sheridan
1:40 pm	Adam Wanstall Corporate Tax Rates and Gross Fixed Capital Formation	Dr. Brandon Sheridan
2:00 pm	Christina L. Byrd The Effect of VITA Participation on Student Empathy	Dr. Susan Anderson

2:20 pm	Ariel Mittleman Analyzing the Antecedents of White-Collar Crime: An Empirical Test of the Fraud Triangle	Dr. Danny Lanier
Lakeside 212 (Moderator: Daniel Cavarretta) [Dr. Titch Madzima]		
1:00 pm	Rachel A. DiCioccio An Assessment of Clinical Measures of Postural Control in Pre-Professional Dancers	Dr. Matthew Wittstein
1:20 pm	Isabel L. Smith Effects of a Ketogenic Supplement or a Whey Protein Breakfast Meal on Metabolism, Appetite and Subsequent Energy Intake	Dr. Titch Madzima, Prof. Elizabeth Bailey, & Prof. Theresa Ramos
1:40 pm	Nicholas Hadgis Unilateral Fatigue Has No Effect on Leg Stiffness	Dr. Matthew Wittstein
Lakeside 213 (Moderator: Carolina Ferreyros) [Dr. Mayte de Lama] The presentations in this session will be in Spanish.		
1:00 pm	Alexandra L. Gaither Fear and Detrimental Memories in <i>Magallanes</i> (Peru, 2015)	Dr. Pablo Celis-Castillo
1:20 pm	William C. Black The Desire for Female Independence in Laforet's Nada Under Francisco Franco's Spanish Dictatorship	Dr. Mayte de Lama
1:40 pm	Cal P. Dougherty Intimate Partner Violence and Abuser Tactics in Dulce Chacón's Algún amor que no mate and Iciar Bollain's Te doy mis ojos	Dr. Mayte de Lama
2:00 pm	Tiffany S. Anderson A Search for Their Own Pleasure: Female Characters in Short Stories of Marina Mayoral and Esther Tusquets	Dr. Mayte de Lama
Lakeside 214 (Moderator: Daniela Ceron) [Dr. Lynn Huber]		
1:00 pm	Mason J. M. Enloe French Islamophobia from the Revolution to Today	Dr. Ariela Marcus-Sells
1:20 pm	Victoria Oakley Rhea Silvia: Rome's Virgin Mother	Dr. Lynn Huber
1:40 pm	Joel P. Green The Development of Malcolm X's Understanding of Race	Dr. Ariela Marcus-Sells
2:00 pm	Sawyer Batts-Parker Nordic Practice as Christian Magic	Dr. Ariela Marcus-Sells

2:20 pm	Alexandra F. McCorkle In WOD We Trust: Christianity, CrossFit, and Conversion	Dr. Lynn Huber
Moseley 215 (Moderator: Jocelyn Pietro) [Dr. Brian Pennington] <u>Symposium: South Asia in Motion; South Asia in Transition</u>		
1:00 pm	Amy Mullan Newcomers and Nursing: Infant Feeding Beliefs and Practices of Resettled Refugees	Dr. Mussa Idris
1:20 pm	Surya Shahi Socio-cultural Factors in Access to Quality Education in the Region of Humla, Nepal	Dr. Mussa Idris
1:40 pm	James Burnham Mr. Modi's Ocean View: Indian Foreign Policy in the Indian Ocean Region	Dr. Jason Kirk
2:00 pm	Anya Fredsell Poses, Pujas, and Prayers: Intersections between Yoga and Religion	Dr. Amy Allocco
Isabella Cannon Room (Moderator: India Kirssin) [Dr. Sean Giovanello]		
1:00 pm	David Nunamaker Authoritarianism and Heidegger's Black Notebooks: An Investigation of the Black Notebooks	Dr. Sean Giovanello
1:20 pm	Spencer Wagner Executive Orders in the First 100 Days: Overturning an Administration or Forging a Legacy?	Dr. Carrie Eaves
1:40 pm	Bear Tosé & Carmen Balleste-Izuzquiza Mapping Urban Inequalities Through Evictions in Alamance County	Dr. Steven Bednar & Dr. Ryan Kirk
Global Commons 103 (Moderator: Francesca Music) [Dr. Cynthia Fair]		
1:00 pm	Sarah Holdren "I pumped, I didn't breastfeed": Toward a More Family-Centered Care Culture for NICUs and the Donor Human Milk Bank System	Dr. Cynthia Fair
1:20 pm	Alexa Trost An Analysis of First Year Students' Mental Health Help-seeking Behaviors and Institutional Perceptions	Dr. Bud Warner
1:40 pm	Lauren Pine Biological, Psychological, and Social Factors Impacting Anorexia Nervosa on Undergraduate Campuses	Prof. Christina Horsford
2:00 pm	Elizabeth Reeve Effects of Helicopter Parenting on the Health Care Transition Readiness of Typically Developing College Students: Perceptions of Higher Education Staff	Dr. Cynthia Fair

Oral Presentation Session III (2:50pm-4:30pm)		
McKinnon D (Moderator: Meg Perry) [Dr. Robert Vick]		
2:50 pm	Alexandra L. Gaither The Effects of Caffeine Intake on Heart Rate Variability	Dr. Robert Vick
3:10 pm	Danielle M. Lombardo The Relationship between Perceived Stress and Heart Rate Variability	Dr. Robert Vick
3:30 pm	Madeline Wetterhall Early Developmental Antiepileptic Drug Exposure Impacts Habituation Learning in Zebrafish (<i>Danio rerio</i>)	Dr. Linda Niedziela
McKinnon E (Moderator: Dr. Jongwan Bae)		
2:50 pm	Jonas Hauser Empirical Test of Weak-form Efficient Market Hypothesis Using Representative Technical Trading Strategies	Dr. Jongwan Bae
3:10 pm	Mason C. Stalph The Impact of the Promotion/relegation System on Financial and On-field Performance in English League Football	Dr. Todd Stonitsch
3:30 pm	Matthew Snow The Role of Venture Capital Networks in Startup Success	Dr. Adam Aiken
3:50 pm	Timon Merk The Gender Dynamics in Venture Capital Funding Decisions in the US	Dr. Kate Upton
McKinnon F (Moderator: Judah Brown) [Dr. Stephen DeLoach]		
2:50 pm	Sara A. Machi An International Transformation of Produce: The Marketing of Imperfect Produce in France and the United States	Dr. Alisha Horky
3:10 pm	Helena Zaeh Not All Sponsorships Are Created Equal: Towards Further Understanding Fan Resistance to Sport Sponsorship	Dr. Nawar Chaker
3:30 pm	Grace E. O'Hara Can Microfinance Help Families in a Hyperinflationary Environment? Field Research in South Sudan	Dr. Stephen DeLoach
3:50 pm	Alicia J. Leja Leadership in the Financial Industry: Empathy and Bilingualism	Dr. Nina Namaste
4:10 pm	Caroline Perry The Use of ICT to Promote Refugees' Integration	Dr. Haya Ajjan

Lakeside 212 (Moderator: Nick Ciolkowski) [Dr. Kathryn Matera]	
2:50 pm	Matthew C. Laing Dr. Joel Karty Why is Electrophilic Addition Sped up at the Ortho Position of a Halogenated Benzene, but Slowed Down at the Analogous Position of a Halogenated Ethene? Application of an Ethylogue Methodology to Determine the Contributions by Resonance and Inductive Effects
3:10 pm	Mary Alice R. Allnutt Dr. Kathryn Matera The Importance of Neurotransmitter-Stabilized Amyloid Beta Oligomers in the Cell Death Mechanisms of Alzheimer's disease
3:30 pm	Jo A. Kelly Dr. Kathryn Matera The Effects of Cholesterol on Amyloid Beta Peptide Aggregates
3:50 pm	Grace E. Bennett Dr. Tonya Train Investigating the Effect of Cucurbitacin B on ERK Activation and Comparing the Apoptotic Potency of Cucurbitacins B, E and I in Leukemic Cells
Lakeside 213 (Moderator: Emily Ternent) [Dr. Kristina Meinking]	
2:50 pm	Grace Landsberg Dr. Shereen Elgamal Identity Perception for Female Muslim-American College Students
3:10 pm	Isabella Saputo Dr. Sarah Glasco The Failure of Assimilation and the Effects of Colonialism on the Experience of Migrants in France
3:30 pm	Sophia Gantenbein Dr. Sarah Glasco Catalyzing A Revolution: Women In French Film
3:50 pm	Melissa M. Purgert Dr. Kristina Meinking Finding the Middle Class in First-Century CE Rome
4:10 pm	Lucy Crenshaw Dr. Kristina Meinking Gods, Myths, and Men: Analyzing Conceptions of Divine in Seneca the Younger's Philosophical and Tragic Works
Lakeside 214 (Moderator: Mason Enloe) [Dr. Pamela Winfield]	
2:50 pm	Autumn D. Rose Dr. Pamela Winfield Tricksters of Japan: <i>Kitsune</i> and <i>Tanuki</i> in the Japanese Folk Tradition
3:10 pm	Megan Hernandez-Greene Dr. Pamela Winfield Religion and Migration in Japan: The Integration of Japanese Spirits into the Japanese-Brazilian Pantheon
3:30 pm	Katherine M. Moritz Dr. Xiaolin Duan The Power of Color: A Comparative Study of Buddhism in China and Japan
3:50 pm	Daniel Weiss Dr. Andrea Sinn Religion at Theresienstadt: Jewish Identity in Holocaust Survivor Testimonies and Autobiographical Accounts

Moseley 215 (Moderator: Dr. Cassie Kircher) Caret Essay Contest		
2:50 pm	Naomi Perry The Wolf by the Ear: The Jeffersonian Solution to Conflict in Charlottesville	1st place
2:50 pm	Caroline Redd Thomas Jefferson: A Contradiction of Beliefs	2nd place
2:50 pm	Natalia Conte Hemings, Hypocrisy, and the Continued Whitewashing of American Politics	3rd place
Isabella Cannon Room (Moderator: Meg Hinote) [Dr. Shannon Duvall]		
2:50 pm	Sarah Allen Creating a Front-end Interface for Interactive Spaces	Dr. Shannon Duvall
3:10 pm	Jack M. Hartmann What is the Impact of Corporate Involvement on Open Source Software Projects?	Dr. Megan Squire
3:30 pm	Jack Landry Analyzing Facial Recognition Algorithms for Robotic Implementation	Prof. Joel Hollingsworth & Dr. Scott Spurlock
3:50 pm	Alexandra Meads Detecting Emotion Algorithmically from Static Body Postures	Dr. Shannon Duvall
Global Commons 103 (Moderator: Stephanie Ntim) [Dr. Katherine Johnson]		
2:50 pm	Bethany V. Lake Migrant Health in Alamance County: Provider and Patient Perspectives on Innovation in Community Based Health Care	Dr. Katherine Johnson
3:10 pm	Lindsay C. Woods Refugee Health: A Quality of Care and Patient Needs Assessment for Refugee Patients at a Community Health Center	Dr. Stephanie Baker
3:30 pm	Abbie Williams Saints Don't Cry: Clergy's Attitudes Towards Mental Health Services and Experiences of Burnout	Dr. Judy Esposito
3:50 pm	Samantha Friedman Investigating the Effects of Outdoor Learning Environments on Students with Autism	Dr. Scott Morrison
SURF Reception 4:30-5:30 The Great Hall, Global Commons		

Symposium: South Asia in Motion; South Asia in Transition

This session underscores contemporary changes in South Asia as a result of migration, cultural exchange, uneven development, and geopolitics. Projects examine emerging issues in South Asia as well as among South Asian communities or practices that have migrated to the West. 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. All presenters are in advanced stages of their two-year research projects. This session will highlight not only students' specific research projects and findings, but also discussion of their experiences of learning from one another, their mentors, and their informants about the process, challenges, and rewards of conducting research abroad and in transnational contexts. "Newcomers and Nursing: Infant Feeding Beliefs and Practices of Resettled Refugees" employs narrative-based interviews with mothers of young children from Bhutan to explore infant feeding beliefs and practices of recently resettled refugee families living in Guilford County, North Carolina. "Socio-cultural Factors in Access to Quality Education in the Region of Humla, Nepal" draws from ethnographic research to uncover the causes of disparities in access to quality education in the most remote region of Nepal. "Mr. Modi's Ocean View: India's

Strategic Vision for the Indian Ocean, a Constructivist Analysis" asks, "What is Prime Minister Narendra Modi's strategic vision for Indian activity in the Indian Ocean Region?" and "How will other factors affect the implementation of this vision?" "Poses, Pujas, and Prayers: Intersections between Yoga and Religion" emerges from a comparative ethnographic project investigating authority, accessibility, and national identity in modern yoga traditions in India and the US. Below are the abstracts of these projects.



Newcomers and Nursing: Infant Feeding Beliefs and Practices of Recently Resettled Refugees

Amy O. Mullan (Dr. Mussa Idris) Department of Sociology and Anthropology

It is recommended by the World Health Organization that infants receive only human milk until six months of age and breastfeeding continue along with appropriate foods until the child is two years of age or older. Risk factors for low breastfeeding initiation and early weaning in the United States include socioeconomic status, race, education level, geographic region, and immigration status, including resettled refugees. The limited available academic literature suggests that rates of breastfeeding among resettled refugees are particularly low. Breastfeeding is important for long-term health outcomes for mothers and babies, therefore this paper argues that the infant feeding practices of resettled refugees should be more closely observed. The purpose of this study was to explore the infant feeding practices of refugee families living in Guilford County, North Carolina. Fifteen newly resettled mothers of young children from Bhutan, Sudan, South Sudan, and the Democratic Republic of the Congo participated in focus groups and individual telephone interviews. Interviews examined the participants' experiences accessing medical services and raising children in North Carolina. Interpreters assisted me in interviewing participants with limited English language skills. Participants were recruited from April-October 2017 using snowballing technique and convenience sampling. Thematic analysis revealed eight themes, including cultural beliefs for child care, necessity of social learning, influence of the recommendations of healthcare professionals on infant feeding decisions, barriers to accessing transportation, challenges accessing language services, maternal employment status, significance of culturally and nutritionally appropriate food, and impact of social support. The results suggest a need for policymakers and healthcare professionals to take into account social, cultural, environmental, and historical influences to improve the delivery of health care services for newcomer mothers and children. Recommended interventions to increasing breastfeeding rates among resettled refugees include cultural humility training for healthcare professionals, improved access to language services for newcomers, and community building that includes the entire family structure.

Quality education in Far Western Nepal: Seeking Equal Access in a Politicized, Patriarchal Society

Surya Shahi (Dr. Mussa Idris) Department of Sociology and Anthropology

Until the beginning of the 1950s, Ranas, Nepal's feudal rulers, limited access to education to privileged members of the upper caste and the wealthier economic strata while the majority of the population remained illiterate. Even after the revolution of 1951 that ended the Rana rule, limited efforts were made to establish system of universal education in Nepal. Although Nepal's constitution is in transition, formal education has technically been guaranteed to all, in reality access to quality education has been unequally and unfairly districted. The purpose of the exploratory ethnographic research, on which this paper is based, conducted in the summer of 2017, was to understand the causes of disparities in access and quality education in the district of Humla, Nepal's most isolated and least developed district. UNESCO reports that the literacy rate in Humla is 47%, making it one of the least literate districts in Nepal. Enrolment in basic

education (grades 1-8) for girls is 81% and 84% for boys, but enrollment in secondary education (9-10) is only 42% for girls and 54% for boys. For this study data was collected using fieldwork observations, focus groups, semi-structured interviews as well as educational policy analysis. Perspectives from students, parents, teachers, the Ministry of Education, other Nepali administrators, politicians, and NGOs were included in this study. This preliminary research points to these factors as the primary causes of limited access to and quality of education in the region: a human labor-dependent agricultural economy, politicization of education, corruption within the education system, patriarchal culture, geographical isolation, the caste system, and stereotypical views toward disabled people.

Mr. Modi's Ocean View: Indian Foreign Policy in the Indian Ocean Region

James H. Burnham (Dr. Jason Kirk) Department of Political Science and Policy Studies

The Indian Ocean, which consists of ocean and coastal waters stretching from the Horn of Africa to the Straits of Malacca, is a critically important region to India. Since 2010, India's GDP has grown between five and a half and ten and half percent, much of it due to maritime trade and in 2013 imported thirty-two percent of their energy resources from abroad. Consequentially, control of the IOR and its security maintains high value in Indian foreign policy considerations. Elected in 2014, Indian Prime Minister Narendra Modi, the strongman leader of the Hindu-nationalist BJP party potentially possesses a unique opportunity to shape modern Indian foreign policy. Along with his election, the BJP gained a parliamentary majority, which has not happened in India for two decades, and never for a party other than the Congress party. While not the first prime minister to have a desire to shift Indian foreign policy, Modi's unique position, along with the self-styled, hyper-masculine persona he has cultivated for himself provides him the opportunity to shape it in profound ways. Since he first stepped onto India's political stage, Modi has relied on the strength of his personality as well as his image to facilitate his political decisions. However, within India and the broader regional context, Modi will be challenged by various institutions, actors, and material constraints which will limit his options for enacting his vision. I take into account data which articulates Modi's plan, as well as scholarly literature to evaluate the aforementioned variables. Central to this research is the interaction between ideas and political and material realities within a constructivist framework. I find that while Modi's public image raises expectations of drastic foreign policy change, the resultant outputs are moderate and less sweeping than anticipated.

Poses, Pujas, and Prayers: Intersections between Yoga and Religion

Anya E. Fredsell (Dr. Amy Allocco) Department of Religious Studies

Drawing on extended ethnographic research in the United States and India, this paper examines the intersections of religion and modern yoga. Modern yoga traditions exist in a complex discursive field populated by contested ideas about religion, secularism, transnationalism, and spirituality. Recent academic scholarship has taken on the task of historicizing and defining the emergence of secularism and spirituality as distinct from the more institutionalized category of religion (e.g., Jain 2015, van der Veer 2014). I argue that although the categories of religious, spiritual, and secular often seem to produce disparate meanings, they cannot ultimately be

distinguished as truly separate entities in contemporary yoga contexts. This paper relies on multi-sited ethnographic fieldwork that entails more than 60 interviews and participant-observation conducted during four stints of study and research in India as well as two years of intermittent fieldwork in the United States. My research participants expressed a wide range of perspectives on whether yoga is or is not “religious”: for example, a Muslim practitioner told me that yoga is “universal” and incorporates “no religion,” while a Sikh participant explained that yoga is universal because it encompasses *all religions*. Others described yoga as “spiritual,” something distinct from institutionalized religion, and another practitioner claimed that the “cultural background is the same” for yoga and Indian religion. These classifications of religious, spiritual, and secular are best understood as porous categories which offer mutually constitutive frameworks related to practice and belief. Modern yoga thus serves as a platform for discourses that both reflect and actively shape contemporary understandings of religion in these contexts and contribute to ongoing conversations about the nature of religion within the field of Religious Studies.

Abstracts by Department/Program

Accounting

The Effect of VITA Participation on Student Empathy

Christina L. Byrd (Dr. Susan Anderson) Department of Accounting

Each year, college students and community members around the United States participate in the Volunteer Income Tax Assistance (VITA) program in partnership with the Internal Revenue Service. Through VITA, volunteers learn how to prepare income tax returns and then complete returns for low-income members of their communities during tax season. In 2015, over 3.3 million taxpayers had their tax returns prepared through VITA, representing refunds totaling just under \$4 billion (Prosperity Now, 2015). While other studies have examined the effect of VITA service on volunteers' knowledge and problem-solving abilities, little is known about how this service affects them emotionally. This project's purpose is to examine the effect VITA participation has on program volunteers' levels of empathy, a key component to leadership and ethical decision-making. The project is composed of two parts: a review of extant literature on the VITA program's impact on volunteers, and a research study conducted this year considering empathy and VITA service. The study leverages the Toronto Empathy Questionnaire to measure empathy in a pre- and post-test design with group of VITA volunteers and a control group of non-volunteers from Elon. Prior to and following tax season, these individuals will complete a detailed survey created using the questionnaire. Along with the questionnaire questions, the survey includes a number of demographic questions so that the impact of factors other than VITA participation on empathy levels can be considered as well. Analysis of survey responses coupled with VITA service observation and interviewing will be used to draw conclusions about the program's effect. All findings and the aforementioned literature research will be compiled in a written thesis. It is anticipated that VITA involvement will be found to positively influence volunteers' empathy levels. This study will be of interest to any institution that encourages involvement in VITA. Further, it will benefit any organization that promotes service learning, by showing that community outreach initiatives do impact volunteers. In short, this project's aim is to substantiate the genuine value of service learning to volunteers, particularly in the sphere of business.

Analyzing the Antecedents of White-Collar Crime: An Empirical Test of the Fraud Triangle

Ariel B. Mittleman (Dr. Danny Lanier) Department of Accounting

The purpose of this research is to empirically examine the association between elements of the Fraud Triangle and white-collar crime. The Fraud Triangle consists of three elements pressure, opportunity, and rationalization (Brickner 2003). Pressure, such as financial problems, family members, or greed, provides the motive to commit fraud (Dorminey 2012). Opportunity describes if there is a weakness or a low likelihood of being caught (Dorminey 2012). Lastly, rationalization is where the perpetrator often rationalizes their actions and feels they are in their "moral comfort zone," meaning they do not feel what they are doing is wrong (Dorminey

2012). According to Dorminey (2012), at least two of the elements need to be present for a fraud to occur. Using data obtained from a proprietary data set containing details for over 2,000 convicted white-collar felons (Marquet 2013), this study develops proxies for the opportunity and pressure elements and tests the extent to which they are associated with the dollar amount and duration of the perpetrators' crimes. The initial findings suggest that the proxies for opportunity (executive/manager status and whether the perpetrator was aided by one or more co-conspirators) and pressure (if motivation was Lifestyle-related) are positively associated with the dollar amount stolen. Results also suggest that executive/manager status is positively associated with the duration of the crime. Taken together, these findings provide some empirical evidence supporting association between the Fraud Triangle and white-collar crime.

Biology

Investigating the effect of Cucurbitacin B on ERK activation and comparing the Apoptotic Potency of Cucurbitacins B, E and I in Leukemic Cells

Grace E. Bennett (Dr. Tonya Train) Department of Biology

Leukemia is cancer of white blood cells and according to the CDC, nearly 23,500 people die from leukemia per year in the United States alone. A plant derived compound of interest in potentially downregulating leukemia cells is cucurbitacin, which originates from the plant family *cucurbitaceae*. Preliminary results in the Train lab have shown cucurbitacin B to be a potent inducer of apoptosis (programmed cell death) in three different leukemic cell lines (Jurkat, HL60, and RAJI). Herein we additionally investigated whether the ERK growth pathway in these three cell lines was affected after treatment with cucurbitacin B. ERK is a protein involved in the MAPK cell signaling pathway. In many cancers, a defective protein in the ERK pathway leads to uncontrolled cell growth. Compounds inhibiting steps in this pathway may act as potential drugs for cancer treatment. Jurkat (T-cell), HL60 (Myeloid cell), and RAJI (B-cell) were treated with 2.5 μM cucurbitacin B for 5 hours. Western blot analysis was performed to determine the relative level of ERK activation in cells treated with cucurbitacin B to untreated. The activation of ERK decreased by 47.3% ($p < 0.10$) in HL60 cells and 39.4% ($p < 0.05$) in RAJI cells. Cucurbitacins come in many different structural forms, each labeled with a different letter. Although the apoptotic potency of cucurbitacin B has been studied previously, the apoptotic potencies of cucurbitacins I and E have yet to be studied in relation to T leukemic cells. Jurkat was treated with or without 2.5 μM cucurbitacin B, E, or I for 5 hours and analyzed for apoptosis by Annexin V binding. Jurkat cells treated with cucurbitacin I demonstrated the highest percentage (12.76 %) of apoptosis after 5 hours vs. no treatment (1.49%) compared to cucurbitacin B (5.52%) and E (9.58%). These results suggest that cucurbitacins appear to downregulate leukemic cells by inducing apoptosis and reducing the ERK growth signaling pathway.

Examining Treehopper Maternal Vibrational Signals During Simulated Predator Attacks

Breanna G. Coughlin (Dr. Jennifer Hamel) Department of Biology

Aggregating, plant-feeding insects play key roles in ecosystems as herbivores, prey, and as mutualists with other insect species. The behavioral mechanisms by which such insects avoid predation and maintain mutualisms can include communication by substrate vibrations. In some species of treehoppers (Hemiptera: Membracidae), females produce vibrational signals when defending offspring from predators, and in at least one species (*Publilia concava*), female signals appear to recruit ant mutualists. Female keeled treehoppers (*Entylia carinata*) defend offspring during simulated predator attacks, and the presence of females and ants increases offspring survival in the field. However, vibrational signals have not been characterized for this species, and it is unknown whether females produce vibrational signals during predator attacks. Here, we first quantitatively characterized *Entylia* female vibrational signals. We then asked whether female *Entylia* with either eggs or offspring signal in response to simulated predator attacks. Because *E. carinata* occurs on multiple host plant species, we measured the responses of females from two different hosts. Female *Entylia* produced many more vibrational signals during simulated predator attacks than during control treatments, and this response did not differ according to host plant species (lmm, predator vs control: $\chi^2 = 34.202$, $P < 0.001$; host plant: $\chi^2 = 2.629$, $P = 0.105$; interaction term: $\chi^2 = 1.158$, $P = 0.282$). Because almost all females on both host plant species produced vibrational signals during simulated predator attacks, we suggest that such signals promote juvenile and/or female survival, perhaps by maintaining juvenile aggregations or attracting ant attendants.

The Effect of Cucurbitacin B on Neuroblastoma Cells

Julianne J. DeBellis (Dr. Tonya Train) Department of Biology

Cucurbitacins, biochemical compounds found within the plant family *cucurbitaceae*, are believed to exhibit both anti-cancer and anti-inflammatory effects. Previous studies in the Train lab have demonstrated that cucurbitacin is a potent inducer of cell death in leukemic cells and there have been other studies demonstrating cucurbitacin's promising anti-cancer activities in pancreatic and breast cancer cell lines yet cucurbitacin's effect on neuroblastoma cells is unknown. This study aims to investigate cucurbitacin B's effect on the human neuroblastoma cell line, SHSY-5Y, by investigating cucurbitacin's effect on cell concentration and induction of apoptosis (programmed cell death). In order to do this, neuroblastoma cells were cultured and exposed to various concentrations (0.025 μM – 2.5 μM) of cucurbitacin B, from six hours to one day. To determine whether cucurbitacin B induced cell death, the cells were stained with fluorescent Annexin V and PI and analyzed by flow cytometry. Annexin V specifically binds to cells undergoing apoptosis and PI stains cells in late apoptosis or cells that have died due to necrosis. Therefore, the effect of cucurbitacin on neuroblastoma cells was determined by the percentage of viable neuroblastoma cells, cells in early apoptosis, late apoptosis, or necrotic cells after 6, 12 or 24 hours. At the lowest concentrations (0.025 μM) and shortest exposure time (6 hr), significant levels of apoptosis (average 37.53% \pm 4.7) were observed compared to untreated samples (average 10.8% \pm 1.9). Higher concentrations and longer exposure times resulted in significantly higher levels of death. This work indicates cucurbitacin B is a very potent inducer of cell death in human neuroblastoma cells. Future research should further study the effect cucurbitacin B has on healthy, non-cancerous cells, as well as explore the lowest concentration of cucurbitacin to have an effect.

The Effects of Caffeine Intake on Heart Rate Variability

Alexandra L. Gaither (Dr. Robert Vick) Department of Biology

Most college-age students obtain caffeine through various drinks. According to the FDA, Americans consume 300 mg of caffeine per day. Caffeine is a substance that has been shown to affect different aspects of human health. This study examines the correlation between caffeine consumed and heart rate variability (HRV). HRV is the variability in time between each heartbeat, and is related to the overall health of a person. Reduced HRV has been shown to be indicative of a poor cardiac prognosis (Malik, 1998). The research on how caffeine affects humans is not consistent. Notarius and Floras (2012) found that HRV increased in healthy middle-aged individuals, while Flueck et al. (2016) found little change in HRV in paraplegic and able-bodied populations. The typical routes of caffeine intake (coffee, tea, soda, energy drinks) were assessed for the amount of caffeine (in mg). This study analyzed various college aged volunteers and a survey was administered to determine how much caffeine they ingested and how much time had passed since their last administration. A 5-minute ECG was used to generate the HRV analysis which was done using ADInstruments software. This study used R-R values (msec) to determine variability and degree of healthiness, based on parameters established by De La Cruz Torres, et al. (2017). The correlation between the amount of caffeine and the variability in R-R time generated a biphasic curve, indicating that too little or too much caffeine correlated with a decreased HRV, in contrast to the mid ranges of caffeine, which correlated to an increased HRV.

Differences in Microbiota Profiles Between Elon University Athletes and Non-Athletes

Marc M. Gibson (Dr. Jennifer Uno) Department of Biology

All-living organisms including fish and humans have microbes or bacteria in their digestive tracts. These microbes, collectively called the microbiome, cause neither harm nor disease and perform critical functions human cells are not capable of properly completing on their own. Recently a body of evidence has emerged indicating that exercise can influence the intestinal microbiome, thus demonstrating another mechanism by which exercise fosters overall well-being. Studies of the microbiome have suggested that exercise can modulate intestinal bacteria with species promoting better weight management, lower inflammation and other positive conditions in trained individuals. The aim of this study is to analyze the impact of high intensity exercise on the intestinal microbiome. We hypothesize that students who exercise more will have increased bacterial diversity associated with healthy intestines. In order to complete this study, stool samples were collected from Elon University athletes and non-athletes. All participants were surveyed for their food preferences and exercise regimen. Microbial samples will be sequenced and compared between the two groups. 10 students' samples have been collected, along with exercise and diet surveys for each individual. The DNA has been isolated and is awaiting sequencing allowing for final analysis.

Elon University Forest 2017 Breeding Bird Survey

Lucas R. Hale (Dr. Dave Gammon) Department of Biology

The Elon University Forest is intended as a permanent natural area for the benefit of the species that live therein. Having a baseline of which species currently inhabit the forest allows future scientists to assess land use change. The aim of my research was to collect a baseline of bird abundance data and then to compare the data to predictions made from abundance data collected from similar forested habitat in central North Carolina. Field data were recorded at Elon Forest during spring 2017. Data from similar forested habitat were collected from eBird, a massive online database of worldwide bird abundance and distribution data. Median species counts showed that overall bird abundance at Elon University Forest is comparable to abundances at nearby similar habitat.

A Comparative Study of Vibrational Communication in Neotropical Katydids

Alina K.M. Iwan (Dr. Jennifer Hamel) Department of Biology

Animals can communicate with each other using acoustic, tactile, visual, chemical, and vibrational signals, and many animals communicate by using more than one kind of signal. The evolutionary pathways that result in animals using multiple kinds of signals are not well understood. With this study, we conducted preliminary descriptive work towards understanding how multimodal communication has evolved in a group of insect species. Katydids (Orthoptera: Tettigoniidae) are insects well known for their acoustic signals, which they use to attract mates. However, some species of katydids also communicate by shaking a substrate, such as a plant stem. The functions of such vibrational signals are unknown in katydids. Although most insects communicate at least in part through such substrate vibration, vibrational signaling is relatively underexplored. Here, we present quantitative descriptions (e.g. duration, peak frequency, rate) of vibrational signals for several species of male neotropical katydids (*Eubliastes pollonerae*, *Balboana tibialis*, and *Neoconocephalus spiza*) recorded at the Smithsonian Tropical Research Institute (STRI) on Barro Colorado Island, Panama. Focal animals were observed at night under controlled conditions using infrared HD video, and vibrational signals were detected and recorded using microaccelerometers affixed to an artificial substrate within 4 cm of the signaling katydid. Our findings contribute to a foundation for testing hypotheses about the evolution of complex behavior.

Terrestrial Snail Response to Substrate Vibration According to Physical Orientation

Emma J. Lavandosky (Dr. Eric Bauer) Department of Biology

Vast numbers of animals use vibrations through land and water for a variety of behaviors such as to detect mates, avoid predators, or communicate among each other. Molluscs in general, and terrestrial snails in particular, possess body plans that would seem to confer advantages in detecting surface vibrations, and yet very little research has been conducted on their vibrational sensitivity. A behavioral analysis was conducted to determine the snail *Helix pomatia*'s responses to vertical displacement while the animal was in a vertical orientation. Preliminary tests showed such vibrations to be generally aversive to the snails, and our further observations were recorded according to the snails' degree of withdrawal from the delivered stimuli. A withdrawal was recorded if the snail's tentacles, head, or body retracted into

the shell during or directly after a 5-second stimulus was presented. Vibrations were presented at three different intensities (6, 8, and 10 m/s) and seven frequencies (10Hz to 640Hz). The results suggested that the probability of snails' responses increased as the intensity of the vibrational stimuli increased. However, across frequencies, some frequencies tended to elicit more responses, and at lower intensities, than other frequencies. Snails' responses had the highest probabilities for the 40Hz vibrational stimuli. While there was some occurrence of withdrawals to lower frequencies, there were very few withdrawals to any frequencies higher than 40Hz. The orientation of the snails on the vertical post (head-up versus head-down) showed barely significant difference in their occurrence of responses to the stimuli. Previous research from the lab has shown that 40Hz is also a very sensitive range for snails oriented horizontally, thus putting constraints on the anatomical identity and location of the vibration sensors of the snails. Ultimately, the behavioral sensitivity to frequencies around 40Hz may correlate to the vibrational communications emitted by predators of the *Helix pomatia*, beetles or toads.

The Relationship between Perceived Stress and Heart Rate Variability

Danielle M. Lombardo (Dr. Robert Vick) Department of Biology

Perceived stress can adversely affect cardiac health, which can be assessed via heart rate variability (HRV). HRV is the variability between heartbeats. Healthy non-stressed individuals have a high variability between beats while individuals who are stressed or have anxiety disorders have lower HRV. We examined the relationship of HRV to perceived amount of stress in healthy college aged students who often vacillate between stressed and non-stressed states. Every week for 5 weeks, each student (n=12) completed a stress assessment and their HRV was then immediately measured using a 5 min EKG with ADInstruments software. We found a slight decrease in average HRV as a function of perceived stress (n=58, $r=0.18$, $p=0.173$), but a slight increase in average heart rate (HR) (n= 58, $r=0.22$, $p=0.094$). Our findings are consistent with earlier studies and suggest that perceived stress is correlated with poor cardiac health.

Snail Sensitivity to Vibrations

Ellen E. Montgomery (Dr. Eric Bauer) Department of Biology

The use of substrate vibrations, such as pressure waves in the soil or movement of a branch, is widespread among animals for a variety of behaviors and has evolved several times. It is estimated that around 200,000 insect species communicate via substrate-borne vibrations, along with thousands of species of arachnids, crustaceans, and vertebrates. An initial step towards understanding how organisms use vibrations in their behavioral repertoires is being able to assess how and to what extent they can detect these vibrations. Snails are model organisms for this type of investigation because they have body plans with extensive substrate contact, well-developed nervous systems, and the ability to learn and create memories via classical conditioning. A behavioral assay was performed to determine the snail *Helix pomatia*'s aversive responses to varying frequencies (10Hz to 640Hz) and intensities (4mm/s to 10mm/s) of vibrations consisting of vertical displacements of a horizontal surface. Observations were made on the degree of the snails' tentacle withdrawal in response to the vibrations. The salient parameter of the vibration

relative to the snail was determined to be velocity, and an initial naïve behavioral tuning curve for the species was created. Additionally, classical conditioning was used to generate a tuning curve better approximating the snails' true range of sensory sensitivity to vibrations. Statistical analysis was performed to determine the probabilities of the snails displaying a strong response or a weak response to each frequency and intensity combination. The results suggested that the snails' maximum sensitivity is around 20Hz, with an upper threshold of 640Hz. Velocity intensities of 4mm/s and lower generated no response until they are paired with an adverse shock stimulus allowing the snails to form a negative association with the vibratory stimulus. This behavioral sensitivity by *Helix pomatia* may correlate with the vibrational frequencies produced by its predators, such as mice, beetles, and toads.

Investigating the Contexts and Functions of Multimodal Communication in Neotropical Katydid

Matthew J. Sears (Dr. Jennifer Hamel) Department of Biology

Animals communicate to survive and reproduce in varied environments. Many animal species communicate using multiple signaling behaviors, despite being able to elicit responses from receivers using only one type of signal. Current hypotheses for why animals use multiple forms of communication relate to the efficacy of signals reaching their intended receivers and whether different signals achieve different functions. Katydid (Orthoptera: Tettigoniidae) are a diverse group of animals that are well known for producing acoustic signals. Individuals of some species also produce low-frequency substrate vibrations by vertically oscillating their bodies to shake a branch or plant stem. Vibrational signaling has only been documented in a few katydid species and the contexts, functions, and benefits of such behavior are largely unexplored. Here, we describe vibrational signals for three species of neotropical katydids (*Docidocercus gigliotosi*, *Subria sylvestris*, and *Idiarthron sp.*) that were recorded in January 2018 at the Smithsonian Tropical Research Institute at Barro Colorado Island (BCI), Panama. Quantified signal parameters include peak frequency, duration, and rate. We observed focal animals in a controlled environment using infrared HD video and recorded vibrational signals via microaccelerometers affixed to artificial substrates. This work provides a foundation for testing hypotheses on the evolution of multimodal communication, a current hot topic in behavioral ecology.

Investigating the Reproductive Outcomes of Prolonged Copulations in *Anasa tristis*

Matthew J. Sears (Dr. Jennifer Hamel) Department of Biology

Across insect taxa, copulation time can vary from 5 seconds to 7 days. In some insect species, longer copulations increase the amount of nutrition and/or sperm transferred to females, and can result in a female that lives longer, produces more eggs, and/or yields more offspring. However, such effects vary across species and are not easily predicted. We examined the effects of copulation duration using the squash bug (*Anasa tristis*), an insect with a promiscuous mating system and prolonged copulation durations. First, we determined the range of copulation durations for 24 pairs of insects. Copulations lasted from 2 min to 23.1 h, and first copulations were longer than second copulations (first: 8.0 ± 4.4 h; second: 2.0 ± 1.7 h; paired t-

test: $t = 5.57$, $df = 18$, $p < 0.001$). To measure the effect of copulation duration on the number of eggs (fecundity) and offspring produced by females (fertility), and on how long females lived after copulating (longevity), we manipulated copulation duration for male-female pairs: pairs mated for 30 min, 2 h, 8 h, or an unlimited duration. Pairs each copulated once except for those that mated for unlimited durations; these pairs also mated an unlimited number of times. Copulation duration did not affect female fecundity ($\ln \chi^2 = 0.071$, $p = 0.931$) or fertility (binomial GLMM, $N = 37$, Log-likelihood Ratio = 1.14 from comparison against null model, $p = 0.320$). Unexpectedly, our findings suggest that multiple copulations may decrease a female's longevity (Kaplan-Meier with log rank test: $p = 0.013$) and fertility (binomial GLMM, $N = 48$, Log-likelihood Ratio = 2.73 from comparison against null model, $p = 0.019$). Consequently, we suggest that long copulations may function in mate guarding, and squash bugs may be good models for studying sexual conflict.

Effects of Morphology on Sprint Speed of *Urosaurus graciosus* Lizards

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

Investigating the relationships between morphology and performance in natural populations lends insight to how natural selection may be operating in real time to make organisms better suited for their environment. This study examines how the physical form of individuals in a population of long-tailed brush lizards, *Urosaurus graciosus*, are modified through the process of natural selection to improve survivorship in their environment. *U. graciosus* primarily live in trees and are known to sprint short distances at high speeds to avoid predators and to catch prey. Lizards that can sprint faster should generally outrun more predators and catch more prey, thereby increasing their survivorship. Studies have found evidence to support that increased hind limb length in lizards leads to an increased maximum sprint speed. If increased hind limb length produces a higher maximum speed, it should therefore also increase survivorship. We examined the relationship between several morphological traits and sprint speed of *U. graciosus* to see if the predicted positive correlation between hind limb length and sprint speed would hold true. Morphological measurements including body length, tail length, hind- and forelimb length, and mass were recorded from 57 lizards in a population located approximately 40 miles north of Phoenix, Arizona during the summer of 2017. The lizards were released by chasing them up an inclined sprint track into a tree under video surveillance. Maximum velocity was determined from the videos using Tracker software. The effect of morphology on sprint speed was evaluated using linear regressions of each morphological variable after controlling for body size. Hind limb length was significantly related to sprint speed ($p < 0.05$). No other variables showed a significant relationship to speed. These results are important because they support the relationships that would be expected if hind limb length was under the control of natural selection.

Soil Characteristics and Abundances of Seeded Prairie Species in Central North Carolina

Sophia S. Tesluk (Dr. David Vandermaast) Department of Biology

Piedmont prairies, characterized by their seasonally dry soil conditions and slow ecological transition to forest, are endangered ecosystems in North Carolina. While these unique habitats

were historically distributed widely throughout the Southeast, they now primarily exist in small, isolated fragments. In order to help preserve and reintroduce Piedmont prairies, this research aims to evaluate the abundances of the most abundant seeded prairie plants and their correlations to soil characteristics in a Piedmont prairie fragment at Loy Farm, part of Elon University. Approximately 0.67 hectares (1.45 acres) of a former agricultural field were seeded with sixteen species of vascular plants native to Piedmont prairies in 2014. In May and again in September 2017, plant cover data were collected from five, 10 x 10 m modules using Carolina Vegetation Survey protocol. Plant presence and cover were recorded for each seeded plant species. Our results indicated a spatial and seasonal pattern of change in abundances of our study plants across the prairie. Soil analysis indicated that, in the parts of the prairie with greater late-season (September) cover of our study species, soil pH (6.1 vs. 5.6) and Ca (954 vs. 344.5 mg/kg) concentration were significantly higher ($p < .05$), but that total exchangeable cations and the concentrations of individual cations (K, Mg, and Na) were not significantly different. Furthermore, our data suggest that the relationship between soil fertility and plant abundances is weak in the spring and becomes strongly positive in late summer possibly because of the decline in soil water availability as summer progresses. This study shows that, even over a relatively small area, seeded Piedmont prairies can demonstrate the heterogeneity and seasonal variation seen in larger, natural prairies. Because Piedmont prairies exist only in remnant fragments, understanding their dynamics at small scales is important.

Early Developmental Antiepileptic Drug Exposure Impacts Habituation Learning in Zebrafish (*Danio Rerio*)

Madeline M. Wetterhall (Dr. Linda Niedziela) Department of Biology

Epilepsy is the fourth most common neurological disorder. While seizures can be prevented by taking antiepileptic drugs (AEDs), some still suffer from uncontrollable seizures due to ineffective treatments. Effective treatment of epilepsy relies upon modulating the activity of inhibitory and excitatory receptors, but cognitive deficits are common side effects. Epilepsy research can be well modeled in zebrafish (*Danio rerio*) due to similarities in genetic mechanisms. The gamma-Aminobutyric acid (GABA) receptor is involved with both excitatory and inhibitory processes depending on the developmental stage of the zebrafish and is one target of AED therapy. The current study evaluated the effects of exposure to AEDs (valproate, carbamazepine, and gabapentin) during the early developmental time period on cognition (as measured by habituation) in zebrafish. Valproate and gabapentin were selected because they target the GABA receptor, while carbamazepine functioned as a negative control because it does not alter the GABA receptor's activity. Dimethyl sulfoxide at the solvent concentration was used as a negative solvent control. Fertilized embryos were placed in 6-well tissue culture plates containing varying concentrations of the three AEDs. To assess cognitive deficits, a sound was played to scare zebrafish into a flight response. A decrease in flight response after repeated exposure to the sound indicated habituation indicative of normal zebrafish cognition. At 6 days post-fertilization, a pretest was conducted by playing a 200-Hz sawtooth wave for 1 s, followed by 5 min of silence, for a duration of 20 min. Habituation training was conducted immediately following the pretest by repeated exposure to the sound sequence for 4 hr. After 16 hr, the posttest was run in the same manner as the pretest. The number of fish responses was tallied from videos of the pretests and posttests. Per capita habituation indices were calculated and

compared between treatments. While differences between treatments were noted, no statistical significance was found. This suggests that AED exposure during the early developmental time period has a detrimental effect on cognition, but the results do not appear to be related to the GABA pathway. Additional studies will be required to investigate the mechanisms leading to this cognitive deficit.

Chemistry

The Importance of Neurotransmitter-stabilized Amyloid Beta Oligomers in the Cell Death Mechanisms of Alzheimer's disease

Mary Alice R. Allnutt (Dr. Kathryn Matera) Department of Chemistry

Neurological diseases such as Alzheimer's and Parkinson's are rising in prevalence as the United States population ages, increasing the need to study the mechanisms by which these disorders affect the brain. In Alzheimer's disease (AD), small oligomeric aggregates of the amyloid-beta ($A\beta$) peptide have been identified as the major toxic molecules. The way these oligomers interact with the brain systems that are damaged in AD, specifically systems involving dopamine (DA) and norepinephrine (NE) signaling, provides mechanistic information about the progression of the disease. The neurotransmitters DA and NE were added to $A\beta$, and the resulting aggregates were analyzed using UV-visible spectroscopy, the Thioflavin T assay for fibrils, the Bradford assay for peptide concentration, and SDS-PAGE for protein separation and analysis. The interaction between these stabilized oligomers and tau protein was analyzed using Western blot, and their toxicity was analyzed using the SH-SY5Y neuroblastoma cell line. $A\beta$ aggregated in the presence of DA or NE produces fewer insoluble fibrils, maintaining a higher concentration of soluble peptide oligomers than when $A\beta$ aggregates alone. SDS-PAGE demonstrated that, after aggregation in the presence of DA or NE, $A\beta$ formed significantly more oligomeric aggregates than $A\beta$ alone, and that these oligomers were a wide range of different sizes. In addition, when tau is added to this solution, several oligomer sizes are no longer present. Finally, DA appears to mediate the toxicity of $A\beta$ oligomers in SH-SY5Y neuroblastoma cells, although this effect is not significant with NE. These data indicate that $A\beta$ may be interacting with DA, NE, and tau in ways that alter the toxicity and structure of $A\beta$ aggregates.

Investigating the Effects Of Stereochemistry on the Cyclization of the Renewable Sugar Sorbitol Using $B(C_6F_5)_3$ as Catalyst

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

Many of the products we utilize every day come from crude oil, including gasoline, plastics, and cosmetics. One of the reasons crude oil is a popular starting material is that it is a source molecules (hydrocarbons, in particular) with relatively simple structures, and those molecules can be used as building blocks to synthesize the desired products. This research aims to find an alternate starting material that can be used to synthesize consumer products so that crude oil is no longer heavily relied on. Investigation of a silyl-protected sorbitol (si-sorbitol; a linear six-carbon sugar) with $CDCl_3$, and a co-catalyst system involving trimethylallylsilane and tris(pentafluorophenyl)borane, abbreviated $B(C_6F_5)_3$ or BCF, led to the formation of a five-

membered ring via cyclization. A preliminary optimization of the isolation protocol was conducted using silica gel chromatography. The stereochemistry of the formed ring is still unknown, but it is determined to be a five-membered ring through NMR analysis (proton, carbon, COSY, NOSY, HSQC). Optimal cyclization occurred when the reaction was performed in the glovebox under nitrogen gas (N₂). Multiple trials were run to screen catalyst loading and to monitor reactions by time progression.

Quantifying Nanoparticle Release from Surface Coatings

Sarah J. Boggins & Todd P. Luxotn (Dr. Justin Clar) Department of Chemistry

Engineered nanoparticles (NPs) are becoming more readily available as additives in many consumer products including paints, stains, and sealants. NPs have been added to these products to increase antimicrobial activity and resist UV degradation. As more NP containing-products become available, it has been questioned whether these NPs have the capability to be released from the products during use and cause negative impacts to both environmental and human health. In this study, the potential for zinc oxide NPs to be released from surface coatings was evaluated using a standard leaching study. Wood samples were coated with zinc oxide NPs dispersed in either water, or a commercial deck stain. After coating, wood samples were placed in synthetic precipitation leaching procedure solution (i.e., simulated rain water) for 72 hours. Following the leaching process, the resulting liquid was sequentially filtered through both 0.45 μ m and 10 kda filters to capture the size and nature (ion vs. particle) of zinc released at various stages. Initial results show the release of zinc is heavily influenced by the dispersion media (water vs. stain), as well as the age of the lumber.

The Aggregation of Amyloid Beta and Insulin Peptides

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

Chains composed of various amino acids bonded together by peptide bonds are the structural units of peptides, which are implicated to be associated with many neurological diseases. With the close correlation between amyloid beta (A β) and Alzheimer's disease and between insulin B (insB) and diabetes, studying how these two peptides aggregate together may point to a link between the two diseases. The two peptides, A β and insB, are very prone to aggregation, which is the interaction of the two peptide chains together to form soluble oligomers as well as insoluble fibrils. The two peptides were aggregated for set time points and the samples were then run and analyzed using a sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE), which distinguishes different sized oligomers from one another and also shows the extent to which the peptides aggregated. This process was repeated for mutated insB peptide with the positively charged amino acid, lysine, altered to neutral amino acid, alanine, to examine the effect a charged species has on aggregation. When the gels, both with regular insB and the mutated insB, were examined, it was apparent that when A β and insB are aggregated together, more soluble oligomers are produced as well as insoluble fibrils, as quantified by a thioflavin T assay. These results showed that the aggregation extent of the peptides was heightened when the two were together rather than separate. Further research will include exchanging a cyclic amino acid, proline, with a lysine, to examine the oligomer and fibril counts with A β .

Synthesis of Organovanadium Complexes as Antibiotic Analogues

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

The 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. Compounds that contain a bond between a carbon atom and a metal, known as organometallics, are a promising source of development in this area. In addition, phosphate groups are important components to many commonly used antibiotics. Vanadates are structural analogues of phosphate groups in which the central phosphorous atom is replaced with vanadium metal. The ability of vanadates to mimic phosphate groups in the context of cellular metabolism indicates potential for these compounds to be used for the development of novel therapeutics. Synthesis of an organovanadium analogue of the phosphonate antibiotic fosmidomycin is under investigation. The phosphorous–carbon bond of fosmidomycin is vital to its function; as a result the reliable synthesis of vanadium–carbon bonds is important for the development of an analogue of this antibiotic. A series of ligand substitution reactions with oxovanadium compounds were conducted with the goal of synthesizing these vanadium–carbon bonds. The vanadium complexes that were explored include vanadyl trichloride, vanadium(V) oxytriisopropoxide, and chlorovanadium(V) oxydiisopropoxide. The nucleophiles used comprise Grignard and silyl reagents such as *n*-butylmagnesium chloride, allylsilane and TMS-phenylsilylacetylene. Resulting reactions were characterized via infrared and UV-vis spectroscopy, as well as ^1H , ^{13}C , and ^{51}V nuclear magnetic resonance spectroscopy. Preliminary results indicate the presence of the desired organometallic product.

Activation of Renewable Sugars by Allyltrimethylsilane-Tris(pentafluorophenyl)borane Catalysis

Jennifer A. Kane (Dr. Jen Dabrowski) Department of Chemistry

Crude oil, a nonrenewable resource, provides much of the world's energy today. It also happens to be a major source for chemicals with industrial and pharmaceutical applications. Access to the same chemicals from renewable resources is more desirable and sustainable. Biomass, and sugars in particular, are increasingly utilized for energy purposes, but their role in alternative applications remains limited. Sorbitan, a cyclic emulsifying agent that has originally been accessed from petroleum biomass, was successfully prepared in a three-step procedure from readily available galactitol, a six-carbon sugar. Preliminary research on the transformation of this class of sugars indicates that two co-catalyzing agents—tris(pentafluorophenyl)borane (BCF) and allyltrimethylsilane—are necessary for efficient regioselective cyclization. Further studies to ascertain the mechanism of product formation were carried out to gain insight into the relevance of temperature, moisture, amounts of co-catalyst, and stereochemistry on reactivity. Sorbitan was isolated utilizing column chromatography and was subsequently characterized by both 1D and 2D NMR (^1H , ^{13}C , COSY, HSQC) and IR spectroscopy. Further optimization of reaction conditions is ongoing.

The Effects of Cholesterol on Amyloid Beta Peptide Aggregates

Jo A. Kelly (Dr. Kathryn Matera) Department of Chemistry

Amyloid beta ($A\beta$), a naturally occurring peptide found in the brain, is known to aggregate readily. These aggregates are a main component of insoluble fibril plaques found in the brains of patients suffering from Alzheimer's disease (AD). While little is known about the presence of aggregated $A\beta$ and its ability to initiate the cascade of steps which cause AD, the difference in toxicity between more soluble oligomers and insoluble fibrils plays a role. The soluble oligomers are considered the toxic form in comparison to the insoluble fibers, making the oligomers more problematic. While many theories have been proposed as to the origins of AD, one hypothesis is that cell death, a hallmark of AD, is caused through the interaction of $A\beta$ oligomers with cholesterol in the cell membrane. Cholesterol, which is a key component of eukaryotic cell membranes, has shown potential to stabilize the toxic oligomeric form of $A\beta$ aggregates. The interaction between $A\beta$ oligomers and cholesterol results in the formation of pores which ultimately allow an influx of calcium ions across the membrane. In cells with higher levels of cholesterol, this influx would be accelerated. SDS-PAGE and Thioflavin T assays, which measure the amounts of oligomers and fibrils, respectively, quantitatively demonstrated that cholesterol does appear to be stabilizing these $A\beta$ oligomers. Based on these results, the effect of cholesterol and $A\beta$ aggregates on the porosity of cell membranes will be investigated using cell cultures. The cells will be utilized to examine the cytotoxic calcium influx created by the membrane interaction between $A\beta$ aggregates and cholesterol. Furthermore, the effect of lipophilic statins, which are known to decrease the cellular concentration of cholesterol, on the rate of that influx will be examined.

Why Is Electrophilic Addition Sped Up at The Ortho Position of A Halogenated Benzene, But Slowed Down at the Analogous Position of A Halogenated Ethene? Application of an Ethylogue Methodology to Determine the Contributions by Resonance and Inductive Effects

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Two important types of chemical reactions that involve $C=C$ double bonds are electrophilic addition reactions and electrophilic aromatic substitution reactions. Electrophilic addition to alkenes are extremely common in constructing a wide range of polymers, with the alkenes acting as a monomer which holds the polymer together. Electrophilic substitution reactions are just as important for other compounds as well, such as benzene for creating drugs like Adderall. When a halogen atom like chlorine is attached to one C atom of the $C=C$ double bond, the rates of these reactions change: electrophilic addition speeds up, but electrophilic aromatic substitution slows down. This is strange because, in both reactions, the rate-determining step is the same, which can be generally represented by: $E^+ + C=C \rightarrow E-C-C^+$. Here, E^+ represents an electron-poor species called an electrophile. To establish why an attached Cl atom has these opposite impacts on the rates, a computational methodology called an ethylogue methodology has been applied to determine the Cl atom's contribution by resonance and inductive effects toward each reaction's ΔE . The electrophile was taken to be $E^+ = H^+$. Ethene was the double-bond-containing molecule used to study the electrophilic addition reaction, and benzene was the one used to study the electrophilic aromatic substitution reaction. The results of this study show that, when the double

bond is part of ethene, Cl contributes toward making the electrophilic addition step more favorable by 26.5 kcal/mol via resonance, but 12.2 kcal/mol less favorable via inductive effects. When the double bond is part of a benzene ring, Cl contributes toward making the electrophilic addition step more favorable by 9.5 kcal/mol via resonance, but 10.0 kcal/mol less favorable via inductive effects. Therefore, for an alkene, the resonance contribution outweighs the inductive contribution, but the opposite is true for a benzene ring. These results are explained by simple resonance theory.

Chained Particle for Enhanced Control over Magnetoactive Elastomers

Joseph Paturzo (Dr. Benjamin Evans) Department of Chemistry

Magnetoactive elastomers (MAEs) are elastic materials which respond to magnetic fields. Such materials have shown much promise within the fields of soft robotics, microscale medical diagnostic devices, and medicine. In this work, a novel MAE has been developed which contains ordered chains of magnetic microparticles within a polymer matrix. It is hypothesized that the chains will enhance the magnetic response of the material. The goal of this research is to collect experimental data on the torques experienced by MAEs within a magnetic field and then to corroborate that data with newly-developed theoretical models. Torque measurements of the MAE in the magnetic field were recorded using a torque magnetometer, while manipulating several parameters. These parameters included the strength of the magnetic field, the concentration of magnetic particles within the MAE, chained versus unchained magnetic particles, and the angle at which the MAE rotated through the magnetic field. Preliminary results indicate that magnetic torques increase with field strength and magnetic particle loading, and that torques are enhanced when magnetic particles are chained within the material. Furthermore, the chains add a directionality to the material, since the orientation of the chains relative to the applied field affects the torque. Future research will attempt to corroborate experimental findings with developing models so that better predictions can be made regarding the behavior of chained-particle magnetoactive elastomers within actuators.

Flavanoidic Composition of Poplar and Sourwood Honey

Meghan E. Peterson & Tanner Pinhero (Dr. Eugene Grimley & Dr. Karl Sienerth) Department of Chemistry

Studies have suggested that flavonoids, which are found in virtually all plant parts, have various beneficial roles in the body, ranging from possessing anti-inflammatory properties to some anti-cancer activities. However, different plants have different flavonoids, and thus exhibit a variety of beneficial properties. The characteristic flavonoids in poplar and sourwood trees can be indirectly determined by analyzing honey that is produced from the nectar of their flowers. This is possible because bees can transfer flavonoids during their collection for honey production. Research on the chemotaxonomy of poplar honey was done in three key stages. First, the separation and comparison of high performance liquid chromatography (HPLC) flavonoid retention times and UV-Vis spectra from honey samples with those from known flavonoid standards was performed. Secondly, the HPLC and UV-Vis fractions were separated and collected. Thirdly, the extracted flavonoids were silylated and analyzed using gas chromatography

– mass spectrometry. These techniques have been successfully tested for method validation and analysis is in progress and will be reported.

Development of Pharmaceutical Precursors from Six-carbon Sugars

Tucker H. Schweickart (Dr. Jen Dabrowski) Department of Chemistry

Crude oil, a nonrenewable resource, provides roughly one-third of the world's energy today and is a major source for chemical compounds with industrial and pharmaceutical applications. The ability to synthesize these compounds from renewable resources is both desirable and more sustainable as there is no release of hazardous bi-products such as lead, carbon dioxide, and carbon monoxide, which arise when refining crude oil. In this study, sugar is transformed into molecules with simpler structures, which could potentially be used in the synthesis of pharmaceutical molecules. Preliminary results have shown that cyclic products could be created from a linear six-carbon sugar source in a simple three-step procedure. This knowledge has led to the discovery of optimal reaction conditions necessary for the production of various cyclic compounds. Our research initially examined sorbitol and galactitol, which are isomeric six-carbon sugars. These differences in arrangements between sugars have been shown to affect the structure of the products formed. Exploration of D-mannitol and L-iditol, which are also six-carbon sugar isomers, has been key in further understanding how structural changes are induced by isomeric arrangements. Our investigation aims to determine the mechanism of product formation and explain the relevance of temperature, moisture and amount of reaction mixture. Each sugar tested has been reacted under a nitrogen-atmosphere and isolated using silica gel chromatography. Structure elucidation was performed using ^1H , ^{13}C , COSY, HSQC and 1D-TOCSY NMR spectroscopy. Future studies include extension of this research to nitrogen-containing sugar compounds that exhibit properties similar to those found in certain pharmaceutical products (e.g., N-ethyl-D-glucamine).

Bcl-2 Family Proteins as Drug targets; Can Prostate Cancer Be Primed for Apoptosis?

Kaitlyn Walsh, Alexis Betsock & Rachel Wilson (Dr. Victoria Del Gaizo Moore and Dr. Mary McManamy) Department of Chemistry

Cancer is a disease of accumulated genetic mutations that alter a cell's function. One of the common cellular functions affected in cancer cells is the apoptotic pathway. Apoptosis, also known as programmed cell death, is a regulatory biological function controlled by protein interactions within the BCL-2 protein family. Normally, cells use this pathway to induce cell death when they detect an error in the cell's functioning that cannot be fixed. In multiple types of cancers, including prostate cancer, there is often an excess of pro-survival BCL-2 proteins. Consequently, these cells have an inability to induce apoptosis leading to an increase in cancer cell survival, sometimes even in the presence of chemotherapeutic chemicals. This research investigates the potential difference in BCL-2 proteins between metastatic prostate cancer cells and pre-metastatic prostate cancer cells. We hypothesize that chemo-resistant cancer cells can be sensitized to BCL-2 inhibitors by first priming their mitochondria with a traditional chemotherapeutic agent. To test this hypothesis metastatic prostate cancer cell lines PC3, LnCap C4/2, and DU145 as well as a normal prostate cancer cell line, PNT2, were used.

Cells were treated with 5 μ M etoposide or 100nM docetaxel for 24 hours or 48 hours, and viability was assessed by MTT and apoptosis via Annexin V-FITC. We found that cell viability was significantly decreased in LnCap and DU145 cells at 24 hours, which can be attributed specifically to apoptosis. Moreover, increasing amounts of apoptosis occurred after 48 hours of treatment. Comparatively, PNT2 and PC3 cells had significantly less apoptosis induced by either etoposide or docetaxel treatment. Additionally, overexpression of BCL-xL in LnCap cells abrogated etoposide-induced apoptosis. Therefore BCL-xL is a potential target for priming. Next, we focused on enhancing the apoptotic effects of etoposide and docetaxel by combining their use with ABT-737, which is a pan BCL-2 anti-apoptotic inhibitor. Evaluating the effects of these drugs on various prostate cancerous cell lines in comparison to the effects on a normal prostate cell line may provide insight into their clinical usefulness and relevance in combination treatments.

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), a well understood nanoparticle previously utilized as a remediation strategy for both chlorinated solvents, molecules causing potential health damages to humans, 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). Bath experiments were completed using a fixed mass of welding fumes and tracking TCE degradation over time. 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 and deionized water for a period of two weeks. These results highlight the potential consequences and beneficial reuse of welding fumes generated from industrial process. The results indicated an overall decrease in concentration of the toxic metals over time. Additionally, the results indicated a higher concentration within the welding fumes that were incubated within the artificial lysosomal fluid (ALF).

Communications

Perspectives on Typographic Design

Claire Dollen (Professor Phillip Motley) Department of Communications

Typography is the process of giving written content a physical body and, through that process, altering the way people receive and interpret messages (Lupton 8). Typographic design considerations are important because they have been proven to affect readers' experiences when interacting with graphic design artifacts (Brumberger 22). Specific guidelines pertaining to

typographic design modifications are often expressed in design textbooks in order to educate students about how to create designs which communicate the messages they desire. These guidelines encourage designers to modify typeface selection, text alignment, letter and line spacing, and layout in specific ways in order to create effective designs. However, there is a limited amount of academic literature available that supports these guidelines. This study intends to fill the gap in this literature and offer perspectives of a designer's typical audience: people who possess minimal academic knowledge of typography. In order to accomplish this, five focus groups were conducted to gather students' responses to stimulus materials created by the researcher. These focus groups investigated how students with minimal knowledge of typography respond to typographic modifications pertaining to typeface selection, spacing, alignment, and layout. Additionally, the perspectives of graphic design students were gathered in order to investigate how the guidelines taught in typographic design textbooks affect their informed attitudes towards the same stimulus materials. The transcribed focus groups are currently undergoing analysis according to grounded theory in which the data is broken down, thoughtfully organized into categories, and examined to find important ideas and a central theme. Initial discoveries suggest that students with minimal knowledge of graphic design have hesitant and varying opinions as to what constitutes "good" typographic design. Graphic design students, on the other hand, generally agree with the guidelines taught in textbooks and are confident in expressing so. Further conclusions will be uncovered and solidified as the data undergoes deeper analysis. The findings from this research will be useful in educating graphic designers as to how to create effective typography for non-expert audiences.

Producing Dance Films: Identifying Unique Traits of Dance Films Not Present in Traditional Live Performance

Lauren E. Duncan (Dr. Richard Landesberg) School of Communications

The purpose of this research was to produce three dance films each piece emphasizing an element or quality that is unique to the film medium. The author acted as producer of each film and also acted in a variety of other roles such as editor depending on the production. The producer established the framework of these stories that emphasizes angles, the power of editing, and space that cannot be replicated on stage. The first film, "Can You Hold Me," is a partner dance which was choreographed for multiple camera angles. The traditional performance space restricts the audience to only seeing one perspective of the performance. The final cut of the film includes high and low angles as well as full 360-degree viewpoints providing the audience with different perspectives it wouldn't see in traditional theaters. Secondly, "Paralyzed" is a solo performance that uses extensive editing experimentation to express chaos on screen. The editor used her control of time and color correction to express the story of a character who is no longer able to feel emotions. The abstract piece shows this emotional journey contrasted by visual chaos. Finally, "Red Dust" is a group performance of eight dancers that expresses a story of one person infecting a group. The choreographer constructed the dance as a stage performance and invited the producer to consider how to play with the space of the film. The final edit shows experiments with space and time representing the dancers within the group but also performing as individuals. This series of dance films attempts to create engaging, high quality dance films using proven aesthetic techniques. These techniques have been formulated by various authors such as Steven D. Katz in previsualized directing and Bruce Block in cinematography principles.

Applying these aesthetic principles is necessary for visual storytelling. Using the choreographer's dance as a script, these practices provide the best approach to the presenting powerful stories on screen. Emphasizing these aesthetics of angles, editing and space in production improved the quality of the films and gave the audience a unique viewing experience of a medium usually restricted to the theater.

An Analysis of the *Yoga Journal's* Presentation of "The Yoga Body" from 1975-2017

Mary Ellen Kempf (Dr. Julie Lellis) School of Communications

The practice of yoga involves disciplining the body in order to discipline the mind and spirit (Johnsen 2014). Ancient yoga texts date back thousands of years, but it's only within the last century that yoga migrated to the U.S. from India (Adavi 2016). Mass media influence American views of yoga; yoga is often seen primarily as a practice to condition the physical body. In addition, American yoga trends – such as “aerial yoga” and “goat yoga” – may bear little resemblance to the traditional practice. Visual culture places an emphasis on the physical body through the use of images (White 2015), which does not emphasize a lived body but rather the visible body's appearance. This study examined the portrayal of the “yoga body” in the American yoga community, using a sample of 38 covers of the *Yoga Journal* – arguably the most established and influential U.S. yoga trade publication—published between 1975 and 2017. Qualitative content analysis included open and closed coding procedures to categorize words and images on the covers. Analysis revealed that emphasis on the physical body in yoga increased significantly in issues after the year 2000. Additionally, the display of complex asanas, or yoga poses, is much more frequent in recent issues of *Yoga Journal*. These images may heighten the competitive and aspirational nature of yoga as a practice to be “mastered.” Further, media may promise the attainment of this ideal yoga body to those who undertake the practice. The ideal yoga body is portrayed by mostly fit, slim, young, white women on the covers of magazines. Images may imply that yoga is not for everyone and may perpetuate myths that the ideal yoga body exists within an extremely narrow scope of bodily differences—one that excludes people of color, older people, disabled people and those who differ from the ideal (Barcelos 2011). Future research should explore the effects of the exclusive yoga body on body image ideals and prevalence of trends such as dieting and overexercising in the U.S.

A Comparison of the Expression of Religion on Social Media by Religious and Unaffiliated Individuals

Margaret J. Malone (Dr. William Moner) School of Communications

This paper reports the results of a survey conducted in early 2018 that examined the expression of religious ideas by religious individuals and religiously unaffiliated individuals on the popular social media sites Facebook, Twitter, Instagram, and Snapchat. The Pew Research Center reports that in 2018, 69% of U.S. adults use at least one social media site, a large increase from 5% in 2005 (Social, 2018). This rise in the popularity of social media means that its data are valuable and may reflect characteristics of the overall population. In the first section, the growth of religious diversity in the U.S. is assessed in correlation with research regarding the rise of social media as a form of interpersonal communication. In the second section, 455 responses to the

survey are analyzed. The survey included general demographic questions as well as questions about religious experiences and social media use. The third section of this report analyzes the differences between responses from the religiously unaffiliated and those who reported a religious identification. In the final section of this report, the religious backgrounds of the religiously affiliated and unaffiliated are compared to understand the rationale for differences in expression of opinions on social media. Differences in respondents' religious backgrounds and their conveying of religious associations on social media can be observed in the survey responses gathered. Preliminary results indicate that 41% of respondents described themselves as agnostic or atheist or affiliated with no religion. These individuals are those referred to in this study as the religiously unaffiliated. The percentage of religiously unaffiliated people in these results is much larger than the percentage of unaffiliated Americans at large the Pew Research Center estimated in its report, "America's Changing Religious Landscape," 2015 (Wormald, 2015). Though the sample size is not large enough to draw concrete conclusions about all Americans or all social media users, interesting correlations can be observed in the aforementioned variances. Some traits the religiously unaffiliated and religiously affiliated shared: both groups, for example, reported that Scientology is the religion least favorably portrayed online. Other traits they did not have in common: the religiously unaffiliated, for example, were 25% more likely to have switched religions at some point in their lives.

The Intersectionality of Girl Power: The Framing of Feminism in Teen Magazines

Eliza J. Mosbarger (Dr. Naeemah Clark) School of Communications

This project investigated the degree of intersectionality and feminism presented in teen magazines. It sought to determine how inclusive the magazines were in their presentation of girl power. There is in-depth research investigating feminism in the media in the late 1990s and early 2000s, but with the recent changing climate of contemporary feminism, in particular the growing notoriety of intersectionality, new research was necessary. This research provides insight with information as to how teen magazines choose to make an impact on their impressionable audience. Teen Vogue and Seventeen magazines were analyzed for content; issues between 2012 and 2016 were randomly selected, accounting for 30 issues per magazine. These issues were quantitatively analyzed for the number of mentions of feminism, the amount of women of color represented throughout, the amount of articles that were determined to be empowering, and those that were intersectional. These determinations were made using operationalized categories, which were then qualitatively analyzed. This research found that the representation of women of color increased steadily over the four-year period. Discussion of empowerment and feminism also increased steadily in both magazines, with a noticeable influx in 2016 for Teen Vogue. Intersectionality and diversity of content increased significantly in 2016 for Teen Vogue as well. The findings suggest that young women are increasingly interested in feminism and activism. Teen Vogue is particularly progressive in its content; it serves as a trailblazer for other publications targeted towards girls and women.

Global Internet Technologists and Innovators Share Fears and Hopes for the Future of Communications Technologies

Alexandra Roat & Melissa R. Douglas (Professor Janna Anderson & Dr. David Bockino)
School of Communications

What are the greatest challenges and opportunities for the future of the Internet? Thirty-seven of the world's top network technologists and innovators from 30 different nation-states shared their fears and hopes in video interviews conducted at the Internet Society's 25th Anniversary conference and Internet Hall of Fame Induction in Los Angeles, California September 17-18, 2017. The highly qualified interviewees included 12 new inductees to the Internet Hall of Fame and 25 young innovators under 25, all of whom were singled out by the Internet Society to be honored after a global search. An eight-student research team from Elon University recorded several hours of focused responses to the research question over a two-day span, posting the full video online as part of the Imagining the Internet Center's documentary coverage of the Internet's ongoing evolution. This qualitative content study presents the commonly identified concerns arising from the responses from a set of celebrated communications leaders, young and old, who represent a broad spectrum of geographic, social, political, and economic backgrounds. Results reveal common concerns over: uses of the Internet for acts in opposition to the common good; government interference in free and open communication; and emerging developments that seem likely jeopardize the original intent of the Internet. Common hopes generally were that the Internet will become faster, more available, and be more widely adopted in positive ways by more people around the globe.

Using Analytics to Assess the AltGov vs. Official Government on Twitter

Andrew J. Scott (Dr. Amanda Sturgill) School of Communications

Alternative government social media accounts have grown in number and size since the 2016 presidential election. Although both official and AltGov accounts purport to provide useful information for audiences interested in government and policy, there is not presently research on the types of information those accounts provide nor on the types of audiences they attract. The present research attempts to fill that gap through analytic analysis of the accounts. The accounts are found to have different focuses for content as well as divergent audiences.

Perceiving the Black Box: Understanding Trust in Algorithms

Anna M. Zwingelberg (Dr. Derek Lackaff) School of Communications

Algorithms – the digital “recipes” written by humans and sometimes by other algorithms to automate processes and solve problems – are invisibly insinuating themselves into every aspect of modern life. Because of algorithms, it is possible to search the internet, find romantic partners, and navigate a GPS system. The algorithms employed by Google, Facebook, and Uber are typically “black boxes.” Users cannot audit them or see how they function. They only see the results the program allows them to see. As algorithms are being incorporated into professions like law enforcement and healthcare, people's lives are increasingly impacted by algorithms in more consequential ways. This study investigates the perceptions that people have of such “black box” algorithmic systems by testing multiple constructs, such as transparency, trust, expertise, perceived diffusion, reputation, and risk perceptions of the technologies, and how they relate to

intended adoption of algorithm-based technologies. The four technologies tested in this study are autonomous vehicles, predictive policing, personalized healthcare, and Facebook Newsfeed curation, which broadly cover very different aspects of everyday life. This study used a nation-wide survey (N=201) with mostly quantitative and some qualitative data to provide insights into how users understand and reason about these black box technologies. Results find correlations among all four algorithm-based technologies among the following constructs: reputation and perceptions of transparency, institutional reputation and intention to use, perceived diffusion and perceived transparency, diffusion and intention to use, and transparency and intention to use. Overall, the study provides insight into the factors that users consider when thinking about adopting black box systems.

Computing Sciences

Creating a Front-End Interface for Interactive Spaces

Sarah H. Allen (Dr. Shannon Duvall) Department of Computing Sciences

Assistive technologies have been designed for years to leverage new technologies to aid those with disabilities, like special applications to help the blind “see” what is on the screen. However there is less research on technology for those with emotional disabilities. People with emotional disabilities often feel emotional distress without logical reasons. They also often have difficulty expressing and self-regulating that emotion. However, when an environment reacts to a user’s emotions, for example with sounds, lights, and games, it can help control this emotional dysfunction. Using this technology can help connect the person with disabilities to new concepts, provide a new environment to entertain people with certain limitations, or simply help them with everyday life. A front-end interface connects the pieces and programs of such an interactive space using a trigger/response set up to run without a programmer. The caregivers will set the triggers and responses, knowing how best the person responds to certain stimuli. The interface can detect behavior associated with emotional disabilities, like flapping, self-injuring, rocking, or moving quickly or slowly. It can then set off a response to alert the caregiver or provide another chosen response to soothe the person, like playing soft music or lowering the lights. The front-end interface was created using Processing and Control P5 that will drive the programs and the trigger/response design. The external trigger and response hardware, like the Leap Motion Detector and Xbox Kinect, are connected to the interface. This project will allow for new, customizable interactive spaces to suit each person’s unique needs. User testing was completed and the interface was changed to ensure usability by our target demographic. The results from the user testing will serve as a basis for future work as well.

What is the Impact of Corporate Involvement on Open Source Software Projects?

Jack M. Hartmann (Dr. Megan Squire) Department of Computing Sciences

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. The primary goal of this research project is to measure and evaluate the impact of corporations on FLOSS teams over time. To answer our research question, we first wrote software to collect, clean and store over 20 million emails used by Apache Software Foundation (ASF) project teams to organize their work. Next, we use data mining techniques to discover patterns in these emails that could be a result of increasing corporate involvement. The ultimate goal of this multi-year research project is to publish research showing a better understanding of the impact of corporate involvement on FLOSS projects, with a secondary goal of creating high-quality data sets that other researchers can use for further analysis. For this SURF presentation, we will describe how FLOSS works and why we selected the ASF as a source for our data. We will show how we collected, cleaned, and stored 20 million emails, and we will show some preliminary results of data mining activities we have completed so far. Finally, we will outline the next phase of our work, which will involve more advanced data mining techniques such as sentiment analysis and natural language processing.

Solar Flowers

Sarah A. Hennenkamp (Professor Joel Hollingsworth) Department of Computing Sciences

The Solar Flowers project aimed to create an aesthetic and functional floral housing for small solar panels. This housing could be used in urban settings to provide an artistic installation that has the potential to charge small electronic devices through the use of the solar panels. When the solar panels lie in idle, the housing could increase the longevity of the panels by protecting them from dust or water damage. To construct the housing, several designs were digitally built in 3D modeling software, Fusion 360, and later physically implemented with 3D printers. The designs were then improved upon with the iterative design method. This approach allows quick implementation of changes and improvement of the design. The resulting prototype houses several small solar panels along with a ring of LEDs which can be remotely controlled with a mobile app. This prototype demonstrates the feasibility of the idea and its design can be further improved in the future.

Spelling Bee: A New York Times Word Game Gone Mobile

Meg Hinote (Professor Joel Hollingsworth) Department of Computing Sciences

Spelling Bee is a fixture in the *New York Times* Magazine puzzle section. Featuring a beehive of seven letters, Spelling Bee challenges the reader to combine those seven letters in as many legitimate permutations as conceivable. The rules are simple: 1) All words must contain at least 5 letters; 2) All words must contain the middle letter; and 3) Words that use all seven letters are worth 3 points instead of the usual 1 point. Whoever has the most points, or can beat the *New York Times*, wins. However, with print slowly going out of style, the challenge was to update this classic game into a mobile app. This presented several roadblocks as the most favorable solution would include a plethora of potential games, randomly presented to the user. On paper, the

solutions are prepared and basic, but an app must be capable of generating a comprehensive list of answers for each possibility. Utilizing iOS app building tools like XCode and programming languages like Swift, a user-friendly interface was designed to house Spelling Bee. Enhanced to randomly choose a word from an extensive selection of 7-letter words each time a user wants to play, Spelling Bee then creates a list of every possible word made up of those 7 letters using the Scrabble dictionary. Simultaneously, Spelling Bee calculates the optimal score by crosschecking to determine how many points each word is worth. Setting this optimal score as a goal, the user is challenged to generate their own valid permutations and match the computer's score. Easy and stimulating entertainment for long waits, family competitions, or a daily commute, Spelling Bee Mobile is the face of the future, transforming classic puzzle games from newspapers and magazines to mobile apps, accessible on a phone at all times.

Analyzing Facial Recognition Algorithms for Robotic Implementation

Jack P. Landry (Professor Joel Hollingsworth & Dr. Scott Spurlock) Department of Computing Sciences

The field of robotics is currently a popular and continuously evolving area of study. As the applications for this technology continue to expand, there has been a push to develop fully functional and autonomous robots to carry out specific tasks. Autonomous robots have numerous applications in modern society, and with the ability to differentiate between faces, this technology is even more valuable. From military search and rescue to delivering messages and mail to the appropriate recipient, facial recognition provides an opportunity to conduct search and identify tasks that are often out of the scope of human abilities. However, implementation of facial recognition in real-world applications poses a number of challenges due to variations in operating environments and platforms. To address these challenges, the author discusses the development of a facial recognition program capable of utilizing a variety of recognition algorithms and evaluates them on various platforms against multiple variables, including lighting, skin pigmentation, and gender. Specifically, we assess results using FisherFace, Local Binary Pattern Histograms, and Eigenface recognition algorithms. Every algorithm is tested on each platform against all variations in variables. For the sake of consistent and reproducible testing, each algorithm model is trained and tested on a set of static images captured on the specific platform for each subject. An analysis of results shows the most efficient and accurate algorithm in regards to differences in environments and platforms. The end result is a face recognition framework that enables the assessment of multiple recognition algorithms for implementation across multiple platforms and applications.

Detecting Emotion Algorithmically from Static Body Postures

Elizabeth Alexandra A. Meads (Dr. Shannon Duvall) Department of Computing Sciences

Emotion recognition technology is an under-explored but significant field. While research exists for computer recognition of emotion from facial expression and dynamic gestures, there is less research on emotion recognition from body posture. We are interested in detecting the emotions of people with emotional disabilities, to help them in the course of their daily tasks. Therefore, monitoring individuals cannot rely on people always looking squarely into cameras or learning

particular gestures. If there were a reliable way to map body postures to emotions, interactive spaces could then be made using low-cost, off-the-shelf hardware such as the Microsoft Kinect sensor to allow elements of the environment react automatically to the user's mood. A challenge is that body posture can be specific to individuals, especially people with certain emotional, cognitive, or communication disabilities who abnormally perceive or display emotion. In this research, we present a framework to learn and recognize a user's custom emotional body expression. Our approach uses machine learning techniques (ie: K Nearest Neighbor) to predict emotion based on the angles of joints (e.g., elbows, knees); we also show why some algorithms are not effective for this specific task. This framework can then be utilized in interactive spaces to assist people with emotional disabilities.

Research and Development of a Safe Rides Web Application

Cassidy M. Neuman (Dr. David Powell) Department of Computing Sciences

Safe Rides, founded in 1992, is a student-run organization on campus that provides rides to those who are too intoxicated to drive or feel unsafe walking home late at night. The organization currently utilizes a spreadsheet-driven process that consists of manually entered user-input by volunteer dispatchers. To request rides, passengers call in and are manually entered into a queue for drivers to pick-up. Drivers are notified via radio dispatch of their next possible pickup. In the 2016-2017 school year Safe Rides received over 5,000 calls averaging 627 calls each month. However, 16% of the total calls received last year were cancelled and another 7% were labeled “no shows”. This research looks to target passengers not cancelling their ride and passengers visibility into the arrival time of their ride in order to decrease these “no show” percentages. Currently this information is only available by calling in and cancelling, or calling in and asking for the wait time. This project aims to improve accessibility of this information through a mobile web page that updates according to their location in the queue, and lets passengers easily cancel if they no longer need a ride. The driver side of the application will update as the passengers request and cancel rides; this method aims to decrease driver time waiting for passengers who are “no shows.” To accomplish the most effective application for both the drivers and the passengers, paper designs were presented to Safe Rides representatives as well as various past Safe Rides volunteers and passengers. After storyboarding a development plan the application was translated to a screen driven design for further feedback from users. After design approval, the application was implemented in a working prototype that maintains passenger and driver information on a nightly basis. The final goal of this project is to create a prototype solution that streamlines the current Safe Rides process, and gives both drivers and passengers greater visibility into their rides.

Economics

Are Prisons the New Asylums? A Look at Transinstitutionalization in New York State

Amanda N. Feldman (Dr. Steven Bednar) Department of Economics

In recent data, the DOJ found that more than half of all the inmates in the United States have a mental illness compared to 11 percent of the general population (Hoke, 2015). Some social

scientists point to the juxtaposition of incarceration rates dramatically spiking while mental institutions were broken up in the 1970s as a possible explanation. This concept of individuals being pushed from one institution to another, psych wards to prisons, is referred to as transinstitutionalization. In this paper, I use individual-level longitudinal data of men in New York State in two cohorts of 1968 and 1978 to analyze the effects of mental illness on incarceration. In theory, transinstitutionalization would show that people with a severe mental illness in the 1978 cohort would be more likely to be arrested than in the 1968 cohort controlling for previous crimes committed, age, race, and county. I found that in 1978, individuals with a mental illness are more likely to be arrested for a substance crime than those with a mental illness in 1968. Although the results are not robust across violent and sexual crime, they could point to individuals with mental illness turning to self-medication with illegal substances because of lack of access to treatment. Most notably, my results showed that in 1968 the presence of depression would decrease the likelihood of substance crime arrest whereas in 1978 the presence of depression was shown to increase it.

How Presidential Elections Influence Gun Sales

Matt C. Furlong (Dr. Brooks Depro) Department of Economics

Using state monthly federal background checks data on firearm sales as a proxy for gun sales, this paper explores how Presidential elections influence gun sales. Previous research in this area focuses on Obama's first election but a gap in research for his second election and President Trump. Previous research has found that President Obama's first election caused an increase in gun sales. To find this, research used regressions based on NICS data. The data from the National Instant Background Check System (NICS), a branch of the FBI, begins in November of 1998 and is used up to 2018. Much like the other research, this research uses NICS data to formulate regressions to calculate the Presidential influence on gun sales. Fixed effects are added to the regressions to account for other variables that may impact gun sales aside from the Presidency. It is hypothesized that both President Obama and President Trump have a significant impact on state gun sales. This hypothesis is based upon basic demand theory. As President Obama, a pro-gun control president, is in office, the fear of regulations preventing the purchases of firearms in the future increases the demand for firearms today. For President Trump, a non-gun-control president, there is less fear of future regulations, which does not put upward pressure on gun purchases today. This paper predicts that President Obama election significantly increased gun sales throughout the states while President Trump election significantly decreased gun sales.

Mapping Urban Inequalities Through Evictions in Alamance County

M. Bear Tosé (Dr. Steven Bednar & Dr. Ryan Kirk) Departments of Economics, Department of History and Geography

In 2016, Alamance County experienced over 3,000 residency evictions, forcing over 5,000 people to move in with relatives or find alternate housing. The only state recognized homeless shelter in the county, Allied Churches of Alamance County (ACAC), has enough rooms to house 102 of such clients, but the remaining turn to homelessness. This study partners with Allied

Churches and the United Way of Alamance County as part of a comprehensive assessment to input and catalog these public record eviction notices for the purposes of better understanding the neighborhoods, landlords, and situations that place residents at a higher chance of being evicted. Eviction data was collected from the county records at the Alamance County Historic Courthouse and stored in Microsoft Excel for analysis. After collecting the addresses of evictions from the data, these were plotted using ArcGIS software, a mapping software. Spatial and econometric analysis was used to examine the demographic and geographic patterns of these evictions, and calculate other factors related to distance to social services, rent due at the time of eviction, and types of complaints. In the timeframe of January 1, 2016 to June 31, 2016 evicted totaled 1026 in Alamance County. Over 60 percent of the evictions took place in the city of Burlington, and 90 percent occurred within conventional housing. The rental median was roughly \$606, \$144 less than the county median for quality housing. The average number of months in back-rent was less than two, suggesting a quick turnaround in rental properties. When mapping our evictions, our findings revealed that a non-proportionate number of evictions come from areas of concentrated poverty – that is those with a high percentage of female headed households, under 100 percent of the poverty level, and from non-white communities. For ACAC and the United Way, this information is critical to developing services that will devote more resources to keeping renting families in their homes, whether that be through increasing affordable quality housing initiatives or expanding rental or legal aid to residents who may experience a drastic temporary loss of income and may be susceptible to eviction.

Healthy Body, Healthy Mind: The Effect of Child Body Weight on Academic Achievement

Brooke A. Hunziker (Dr. Katy Rouse) Department of Economics

One in every six children suffer from obesity in America today. Childhood obesity can cause a lifetime of poor health, low self-esteem, and lower levels of productivity. This paper asks the question of how a child's academic achievement is affected by their body weight. Theoretically, as a child's BMI deviates from the standard healthy level, their academic achievement, measured by test scores, will decrease. While many studies look at the effect of body weight on adults and adolescents, the literature on younger children is notably absent. This paper seeks to fill this gap. This study uses panel data from the Early Childhood Longitudinal Study (ECLS-K:2011). The data comes from surveys of 18,174 children over the course of three years from kindergarten to second grade. I first estimate baseline ordinary least squares (OLS) regressions, estimating the impact of child BMI on reading, math and science test scores. I control for gender, race, location of school, family poverty level, private versus public school, if the child receives free or reduced lunch, and number of days of exercise per week. I also run OLS regressions where I replace BMI with dummy variables indicating whether a child is overweight or obese. Finally, I exploit the panel nature of the data and use a fixed effects model. This model enables me to control for all permanent unobserved characteristics of students and therefore addresses the potential omitted variables bias inherent in OLS estimation. Results imply that as a child's body weight deviates from the healthy level, their academic performance falls. This result is found across all OLS regression models, with the strongest effect seen in math where obese children see a decrease in their math scores on average by 1.106. However, once fixed effects are included, the reading and science estimates are no longer statistically significant. This result suggests the impact of body weight is primarily concentrated in math.

Changes in School Start Times and Teen Traffic Fatalities

Stephan W. Marsh (Dr. Andrew Greenland) Department of Economics

There is a growing national debate surrounding an appropriate time for high schools to begin their instruction. A plethora of research suggests that adolescents are biologically incapable of sleeping sufficiently when required to wake up too early in the morning. This improved understanding of the adolescent sleep cycle has led schools across the country to delay their start times. However, these changes often mean that adolescents are now driving to school during the peak morning commute “rush hour.” To understand the impact of this change, start time and traffic fatality data from North Carolina was aggregated at the county level and examined over the period of 2008 to 2015. A 9% increase in the teen traffic fatality rate for 2-car accidents during the morning commute to school was found to be a result of later start times. These accidents overwhelmingly involved adult drivers. Changes in school start times did not have any other significant effects on teen driving outcomes during different time periods and scenarios.

Exploring the Effect of International Wage Differences on Brain Drain

Austin S. Martin (Dr. Brandon Sheridan) Department of Economics

Brain drain has proven to be a contentious issue for both politicians and economists over the past 50 years. More formally known as “high-skilled emigration,” the effects of brain drain have been thoroughly debated and explored, yet the causes behind the phenomenon have not received as much attention. Previous literature has explored various qualitative factors behind migrant flow and sorting, but very few studies have focused on the role of wage differences in individuals’ decisions to emigrate. This paper examines how international wage differences affect brain drain by comparing the effects of skill-specific wage differences on low, medium, and high-skilled emigration. This paper further updates the existing literature by employing a relatively new dataset on emigration rates by education level, which spans from 1980 through 2010 in five-year increments. Since this data is based on source and destination country pairings, it lends itself well to the gravity model of migration. A modified gravity model constitutes the basis for the empirical analysis. The empirical model finds that wage differences may have a significant and positive effect on medium- and low-skilled emigration, but an insignificant effect on high skilled emigration. Border contiguity is similarly significant for all emigrants except those that are high-skilled. These results are consistent with previous literature, but highlighting the fact that these effects are unique to high-skilled emigration is a step forward in understanding the brain drain phenomenon.

The Relationship Between Income Inequality and Life Expectancy

Christian F. Reese (Dr. Mark Kurt) Department of Economics

The United States and South Africa both have life expectancy rankings well below their GDP per capita rankings. South Africa has the 116th highest GDP per capita, but the 190th highest life expectancy. The United States has the 20th highest GDP per capita, but the 43rd highest life

expectancy. Further, both of these countries have very high Gini coefficients. South Africa's is 62.5 and the United States is 45.0. Statistics such as these indicate that the relationship between the average income and average life expectancy of a country's citizens is more complicated. An increase in the overall income of a country does not equate to everyone receiving the same income increase. The new gains generated in the economy tend to be concentrated in the already more affluent, which leads to the lower class being poorer relative to the rich than they were before the income increase. Added urgency has been placed in understanding the distributional effects of income on health as income inequality has increased greatly over the last 40 years. This paper will investigate the effects of how the distribution of income across its citizens impacts average life expectancy across countries. Using data from the World Bank, regressions will be run with life expectancy as the dependent variable. The regressions will show a clear effect by the Gini Index on the life expectancy, which signifies the effect that income inequality has on life expectancy. It is believed that a higher GDP per capita leads to longer lives in country, but, in actuality, this is not true unless the wealth is spread throughout the country. This makes income equality and the Gini Index a better indicator of the average life expectancy in a country than GDP per capita.

Corporate Tax Rates and Gross Fixed Capital Formation

Adam C. Wanstall (Dr. Brandon Sheridan) Department of Economics

With the Tax Cuts and Jobs Act of 2017, the United States lowered its statutory corporate tax rate, the rate at which corporations are taxed on income earned within the United States, from thirty-five percent to twenty-one percent (Cong. H.R. 1, 2017). This legislation was passed with the intent of incentivizing investment within the United States. This study analyzes whether the manipulation of statutory corporate tax rates is an effective tactic to incentivize investment. Through the regression analysis of fifteen years of data from thirty-two member states of The Organization for Economic Co-operation and Development (OECD), this study finds that statutory corporate tax rates have a small, negative effect on corporate investment. Due to this, it is concluded that the Tax Cuts and Jobs Acts, as well as any similar future legislation, will not likely have a substantial effect on corporate investment.

Migration and Educational Outcomes

Sean D. Webber (Dr. Brooks Depro) Department of Economics

Each year, nearly 12% of the American population moves from one location or area to another. (Jordan 2016). Additionally, the average American moves over 11 times throughout their lifespan. Family migration is defined as a movement for a family from one location or area to another. Often, families migrate for a variety of reasons including social, political, and economical. However, as families migrate, it can lead to a variety of changes in both neighborhood and family dynamics. These changes can then impact educational outcomes and attainment for young students dealing with a new move. This study explores the impact of migration on educational outcomes. More specifically, the research focuses on students who migrate outside of their county and how that affects their years of education obtained. Furthermore, this study looks to see whether the migration effect varies by race. This research

theorizes that students who move outside of their county as a youth will have fewer years of education in comparison to those who do not move outside of their county. Additionally, the study hypothesizes that students of color will have this same negative association between migration and educational outcomes but on a more significant level. This research uses the traditional economic production function model with factors of labor and capital using study hours as labor and school quality as capital as the inputs to the function with its output being years of education obtained. Migration would be accounted for in the model as a part of total factor productivity. Data is gathered from the National Longitude Survey of Youth and used to perform a regression analysis to determine the impact of migration on the amount of education obtained. The results of this study could influence policy makers to help youth who move from their homes.

Education

Teachers of Color and the Achievement Gap: A View from Black Students

Virginia E. Little (Dr. Cherrel Miller-Dyce) Department of Education

This mini review of literature examines the role of Black teachers in closing the achievement gap for Black students. The extant research is clear regarding the history of education, inequities, and barriers affecting Black students in America's public schools (Howard, 2010). While we have seen the Black/ White achievement gap narrow from the 1970s through the 1980s, we have seen this progress stagnate and, in some cases, reverse since then (Jaekyung, 2002).

This review situates Black student's views on teaching and effectiveness of teachers of color as catalysts for closing the achievement gap (Villegas, Storm, & Lucas, 2012). Amplifying the voices of Black students, this inquiry presents findings from eight journal articles, one book, one dissertation, and one documentary, to see what the students themselves have to say about their own education. In doing so, this mini review identifies ways in which Black teachers can have a unique role in the process of closing the academic achievement gap in order to increase Black student's success (Foster, 1989, 1994). From the data examined, the researcher uncovered findings that were consistent with previous research. The findings were folded into the following three themes; first, racial congruency is important but more significant is the teaching processes in which the teacher, despite race, understands the importance of Black culture, history, and current realities. Second, racial congruency correlates with more effective mentoring of Black students. Thus, teachers who are Black often navigate mentoring relationships more effectively with Black students. Third, Black teachers serve as positive role models for Black students as they consider future professional roles. Given the negative images and media stereotypes of Black communities, Black teachers serve a unique role in creating a pipeline for professional aspirations. The hope is that these findings will increase our understanding of how Black students experience education, the importance of creating a more diverse teacher workforce, as well as the necessity to create more inclusive content in teacher education classrooms.

The Right Book for the Right Student at the Right Time: Comparing Students' Choices between Narrative and Informational Texts

Caroline C. Bowen (Dr. Julie Justice) Department of Education

The purpose of this study was to investigate children's text selection choices, specifically focusing on narrative versus informational books. While teachers and schools have tended to rely more strongly on narrative texts for reading instruction, research that investigates how children choose books for themselves reveals that children frequently prefer reading informational texts over narrative texts (Correia, 2011, p. 102). Because recreational reading is important to children's development as readers, it is important to know why children are choosing or not choosing to read a certain book. This research was conducted in an after school program for elementary-aged children located in a low-income housing development. Reading tutors each brought ten books to seven weekly meetings with their student. They collected data on the books they brought, the books their student chose to read, and a rating and review of the book. Data was analyzed to understand group patterns as well as sub-group patterns and themes. Preliminary findings indicate that students preferred narrative text to informational text across the whole group and in most sub-groups. Teachers tend to read narrative books more than informational books, even though the research shows that children prefer informational books. However, our findings contradict previous research because we found that the students actually do prefer reading narrative books. Themes found in children's responses to the books as well as reading tutors reasons for bringing books provided some explanation for this discrepancy. This research is important because understanding the rationale behind students' book choices will better inform teachers in their selections for read aloud and classroom library books.

Taking a Global Perspective: A Case Study of an International Teacher

Samantha J. Collins (Dr. Joan Barnatt) Department of Education

Currently in the United States, there are more than 20,000 international teachers working in K-12 schools (Dunn, 2011). These teachers fill a need for highly qualified educators, as native speakers in a language other than English. Language teachers remain in high demand in the US, where teachers are most often monolingual, despite increasingly diverse student populations, growing numbers of immigrants, and K-12 students whose primary language is not English (Ovando & Combs, 2018). International teachers come from countries outside of the US, generally for a period of 3-5 years to work in US schools, utilizing their skills in their native language. With little research on the experience and impact these teachers have in US classrooms, this study provided the opportunity to identify areas of high concern for further research. Findings from this international teacher indicate that more and different types of mentoring support overall are required, in comparison with their native English-speaking counterparts. Specifically, additional support for integration into the broader community as well as into the school community is indicated. This support offers potential for successful personal and professional adjustments to the school setting (Ingersoll & Strong, 2011). This exploratory qualitative case study utilizes three semi-structured interviews and survey data addressing cultural competence from one international teacher to address the questions: What is the experience of an international teacher working in the United States? How does the experience as a non-native language teacher influence her views as a global educator? A case study of an exemplary international educator allowed for an in-depth exploration of one educator to understand her experience, choices, and background. This Colombian native teaches fifth grade in a dual-language Spanish immersion program. She was purposefully chosen as a representative

of a successful international teacher working in U.S. K-12 schools. This study employed Grounded Theory (Charmaz, 2010) to develop codes and themes, reading and re-reading data from interviews in an iterative fashion. Data from the Cultural Intelligence Survey (Ang & Van Dyne, 2015) was then triangulated with the interviews.

The Right Book for the Right Student at the Right Time: The Role of Gender Boundaries in Book Choices among Children

Marlies R. Emmelot (Dr. Julie Justice) Department of Education

This study examines elementary school students' selection of books in relation to perceived gender boundaries. Research pertaining to student text choice and gender has found that the match between the child's gender and the perceived gender-appropriateness of a text is a central pressure in book choosing behavior of children (Dutro, 2002; Mohr, 2006; McGeown, 2015). In some instances, children go beyond gender boundaries when requesting and reading books; however, research is lacking in the area of understanding when children are likely to do so. Therefore, this study investigated whether or not children chose to read books outside of gender boundaries and their level of engagement with those texts. Elementary aged children at an after-school program were presented with ten books per week, provided by a university student, to be read to them that day. College students recorded why they brought each book, if the child chose to read the book, how the child acted while being read to, and how engaged the child was. Initial results of this study indicate that female students were more likely than male students to request texts out of their gender norms. Girls reported that they'd chosen books that were more typically chosen by boys because the texts represented their personal interests and were more likely to read them if they had specifically requested them. Boys were less likely to deviate from perceived gender boundaries in their text choices. Additionally, when female students requested texts outside of their gender norms, those texts were more likely to be informational rather than narrative. These findings extend the dialogue in the field about children's text preferences and gender, allowing educators to better understand how to support children's reading development.

Globalism in Literacy Utilizing Technology Through the Global Read Aloud Project

Kristine N. English (Dr. Julie Justice) Department of Education

Since its inception in 2010, the Global Read Aloud (GRA) project has involved more than one million students from at least 60 countries in a project that connects classrooms across the world through the discussion of common books. Lock (2015) suggested that "connecting, communicating, collaborating and co-creating knowledge with others beyond our local communities have never been more attainable than we are currently experiencing in today's digital world" (p. 140). GRA focuses on making connections beyond local communities, and doing so through technology and literature; however, no research has been done yet to understand the participants' objectives for taking part in GRA and their overall outcome. This study investigates teachers' initial intentions for participating in the Global Read Aloud project, and their perceived outcomes from the six-week program. The data for this study was collected from a 31-item anonymous online survey that gathered quantitative and qualitative data regarding the participants, their GRA experiences, and their perceptions of those experiences.

Invitations to respond to this survey were sent via e-mail, Twitter, and Edmodo to participating educators registered for the 2016 GRA. There were 204 participants in this survey and the results from these participants were collected and analyzed for the purpose of this study. The preliminary results from this study indicate that the majority of GRA participants joined the project hoping to bring global connections and collaborations into their classroom. Interestingly, many of these same participants stated the aspect of GRA that created the highest levels of engagement and the greatest learning gains for their students was the increased use of technology in the classroom. Further analyses of these data are in progress; nonetheless the results of this study will provide substantiation as to why participants' intentions and expectations varied, and whether or not there are trends to explain the change that occurred prior to the Global Read Aloud for participating educators, to after the conclusion of the 6 week GRA program. Results of this study will provide evidence of the correlation between global relationships, collaboration, literacy, and technology, as well as the importance and inevitable connection between these aspects.

After-school Science: Promoting Girls' Science Identity Development

Hannah R. Franklin-Gillette (Dr. Mark Enfield) Department of Education

This research seeks to describe three girls' identity development during a year-long, STEM after-school science program. The program took place at an elementary school in a high poverty area and was designed to integrate engineering and design experiences, employ technology to support multimedia authoring, and apply a STEM instructional framework. It has been documented that girls are a marginalized group in STEM learning. This study seeks to understand how marginalization due to gender affects students' learning of science and their identity development as capable of participating in STEM learning. It is important to learn how girls' knowledge of STEM develops and how they view themselves as capable science learners in order to develop practices that effectively include girls in science, promote their learning, and positively affect their STEM identity development. This research follows a case study design focused on three girls' participation in a voluntary, year-long, after-school science program. Researchers recorded and analyzed each girl's identity development. Data includes students' work, researcher annotations, video recordings of sessions, mini-interviews, and participant-generated multi-media recordings. Data is still being analyzed, but the analysis will allow conclusions to be made about the girls' identity trajectories in science as a result of participating in this year-long after school science program. Primary analysis suggests that engagement throughout the program and the opportunity to complete the program are important factors in identity development, as one girl who was not able to finish the program suffered in this regard as a result.

Investigating the Effects of Outdoor Learning Environments on Students with Autism

Samantha A. Friedman (Dr. Scott Morrison) Department of Education

Students with Autism Spectrum Disorder (ASD) enter school with special education needs, which are typically addressed by a variety of traditional interventions. These interventions may include cognitive behavioral therapy, applied behavior analysis, and occupational therapy and

can be costly and time-consuming. The focus of this project is using outdoor learning environments, an emerging and understudied enhancement to interventions for students with ASD. We interviewed 10 practitioners from three countries who work with students with ASD in outdoor learning environments. Questions focused on perceived benefits for students with autism and advice for other practitioners. The benefits fell into four categories: academic benefits, sensory benefits, behavioral benefits, and developmental benefits. Advice for teachers fell into three categories: interactions with students, planning and preparation, and risk assessment and management. We also collected quantitative data at a local elementary school with several outdoor learning environments available on their campus. The participants included two special education teachers, who co-lead the resource room, and five students with ASD who make up the school's social skills group. Using a four-month long single-case research design, we investigated the social, educational, and behavioral effects of outdoor learning environments on the students with ASD. The use of outdoor learning environments was in addition to the interventions required by the students' individualized education plans (IEPs). The data revealed that taking students with ASD into outdoor learning environments, in combination with interventions and supports required by the IEPs, increased verbal communication skills, encouraged question-asking, and decreased the likelihood of behavioral outbursts and tantrums. We discuss the implications of these findings for practitioners, parents, and students with ASD.

The Impact of a Mentor Based Program on Self Esteem and Perceived Body Image in Older Elementary School Girls

Anna M. Linsz (Professor Elizabeth Bailey) Department of Education, Department of Exercise Science

Body image dissatisfaction is prevalent among children, and can have a negative impact on mental health. Research suggests that programs need to address attitudes toward body image with older elementary school children before these attitudes become difficult to change. The Alamance Girls in Motion (AGIM) program pairs female Elon students with 4th and 5th grade girls in an effort to mitigate issues of body image and self-esteem, and promote healthy eating and physical activity using age appropriate materials and mentorship. Mentoring relationships have been associated with improved self-esteem in mentees, and mentors have also been shown to benefit. AGIM health education materials were recently updated to include more interactive and mentor led instruction on influences of body image, so the purpose of this study was to investigate the effectiveness of these updates on self-esteem, socio-cultural influences on body image, and perceived body image in both mentors and mentees participating in AGIM. Research participants were recruited from adults and young enrolled in AGIM. Eleven girls and 9 mentors completed the study. During the 7-week program, pairs met for 90 minutes to exercise and discuss identified topics in small groups using the new materials and one on one. Prior to and following completion of the program, mentees and mentors completed the Rosenberg Self-Esteem Scale (R-SE), and two subscales of the Eating Disorder Inventory (Drive for Thinness [DT] and Body Dissatisfaction [BD]). Attitude towards appearance as influenced by media/cultural sources was evaluated using the Socio-cultural Attitudes Towards Appearance Scale (SCATAS). SCATAS is divided into 2 dimensions; awareness (A) and integration (I). Similar to previous investigations, R-SE ($p = 0.02$) and DT ($p = 0.05$) improved in mentees

following participation in AGIM. In mentors, DT ($p=0.05$) and BD ($p=0.008$) were decreased. Positive changes were only observed in SCATAS for the mentors, potentially because media influences were less salient for the young girls who had very low scores to begin with. While the program's new materials appear to be effective in meeting the goal of AGIM, a better understanding of the impact of media on body image in young girls is warranted and should be investigated further.

Adventure Based Learning and the Positive Influences on Mental Illness

Katie C. Meier (Dr. Carol Smith) Department of Education

Adventure based learning and outdoor based education is becoming increasingly popular amongst schools all over the world. Although there are many added benefits of adventure based learning, one of the largest impacts has been on mental health in students who engage in outdoor education. Mental illness is an increasing problem throughout the world and especially in the United States, so finding alternative solutions to this problem is of high importance. The purpose of the study is to discover how adventure based learning impacts mental health in students. Different studies conducted by researchers were evaluated and analyzed to find results. According to Mutz, M., & Müller, J (2016), children that participated in an outdoor education program had significantly less worries over time compared to the control students. Studies showed that a reduction in stress resulted in a reduction of mental illness. The findings suggest that participation in outdoor education and adventure based learning decreases the chances of students developing mental illness and reduce symptoms of mental illness.

College Students' Perspectives on Special Education in Their Families

Emma C. Mutascio (Dr. Stephen Byrd) Department of Education

The focus of this study is on college students' general perspectives about having a sibling with special needs. Research has shown that siblings of people with special needs have the potential to be strong advocates for their siblings (Arnold, Heller, & Kramer, 2012). Additional research has shown that siblings also need support establishing their mindset regarding their family member with special needs (Moyson & Roeyers, 2012). It was hypothesized that siblings would state the need for support during their sibling's diagnoses process, as well as consider themselves strong advocates for their family member. It was also expected that the study participants would share varying views of special education in their families, but would find the use of educational support resources beneficial. The participants in this project were Elon University college students who have a sibling with special needs. These disabilities include Attention Deficit Hyperactivity Disorder, dyslexia and autism. In the first phase of this study, participants filled out an online questionnaire sharing their perspectives about having a sibling with special needs and the impact on the participant's family. At this point, the participants are interested in the second and third phases of this study. These include group and individual interviews. Preliminary results from the online survey suggest the following key themes. The participants felt they were adequate advocates for their siblings. The results also suggest that the participants believe they had resources that helped as their sibling went through the diagnoses process. One participant stated that their sibling's diagnoses caused a strained relationship with the parents.

Another participant stated no tension occurred within their family. Further analysis suggests looking deeper into resources that could help siblings advocate for their family members, and how families might benefit from this advocacy. Results could possibly impact greater resources and advocacy for college students themselves.

The Impact of Promoting Positive Body Image on Academic Performance in Adolescent Girls

Emma E. Pippert (Professor Elizabeth Bailey) Department of Education, Department of Exercise Science

Body image is a relevant issue, particularly among adolescent girls as they become more focused on their physical appearance. As a desire for thinness increases, negative consequences have been observed, including decreased academic performance. The purpose of this study is to investigate whether education around body image and the use of supportive messaging in a school setting will improve perceptions of body image, and subsequently academic performance. Fourteen sixth grade girls were recruited from a local middle school to participate in this study during the 2nd marking period. Parental informed consent was obtained and students signed an assent form. Prior to the intervention and following its completion, participants completed the Eating Disorder Inventory (with 2 subscales, desire for thinness (DT) and body dissatisfaction (BD)) and the Social Physique Anxiety Scale for Children (SPASC) to assess perceived body image and the Academic Competence Survey (ACS) to assess confidence in science. The intervention included supportive messaging via stickers reading 'Smart is beautiful, I am beautiful' that the classroom teacher attached to science assessments (3), and a 40 m interactive lesson provided by the researcher on the importance of positive body image and body acceptance. Grades in science were collected at the end of the 1st and 2nd marking periods to assess academic performance. Science grades for the intervention group were compared to de-identified science grades for the same marking periods for 6th grade girls from the previous school year. There were no differences in measures of perceived body image (DT: Pre=4.9±1.2, Post=5.1±1.3, p=0.44) (BD: Pre=8.0±1.3, Post=8.5±1.2, p=0.33) (SPASC: Pre=29±2, Post=27±2, p=0.23) or science confidence (Pre=21±1, Post=23±1; p=0.27) from the 1st to 2nd marking period. There were also no differences (p>0.05) in science grades for the intervention group (1st marking period=94±1%; 2nd marking period=95±1%) or when compared to science grades from the previous year (1st marking period=88±2%; 2nd marking period=90±2%). It is possible that the intervention was not powerful enough to impact these measures. However, the lack of a control group and small sample size were further limitations. Given the prevalence of the issue and simplicity of the intervention, further research is recommended.

Understanding Adolescents' Perspectives of Their Middle School Experiences

Allie Roth (Professor Marna Winter) Department of Education

My research project seeks to understand the difficulties and struggles that middle schoolers face during a point in their lives which researchers suggest is a critical time of development (e.g., Kingery, Erdley, C.Marshall, 2011; San Antonio, 2006; Sadowski, 2008). In middle school, students are introduced to a complex school environment that often includes new social and

academic influences. Adolescents are dealing with physical and emotional changes that can be intensified during middle school due to fluctuating hormones and brain development (Steinberg, 2014 & Wang Holcombe, 2010). However, there is little research that examines how middle schoolers, specifically 6th through 8th graders, perceive their own educational and social experiences during this time.

After receiving approval from Elon's IRB board (Protocol #18-075), surveys based on the School Success Profile (Bowen, 2008) were distributed to 24 participants. Survey questions focused on the social atmosphere including friend groups and the academic environment regarding how they feel about the rigor of their coursework. To gain deeper insights, six students were selected to participate in interviews.

Based on survey and interview responses, a defining factor in a positive middle school experience is rooted in whether or not a student has classes or extracurriculars with friends. This does not necessarily mean being part of a specific friend group but rather having peers in close proximity. The transition from elementary to middle school is made easier when students are with friends and have supportive teachers. The data suggests that students appreciate the freedom that comes with being in middle school. Participants in the study articulated that participating in extracurricular activities and having a solid social group was important in making the middle school experience more balanced. These findings show the correlation between participating in extracurricular activities and having a more positive middle school experience. From this research, I can conclude that approachable teachers and counselors are vital to improving the lives of students during middle school. The way adolescents view themselves in friend groups is important to happiness in middle school.

More Than Learning Spanish: Teaching Students with Autism Spanish Using Technology

Lauren M. Ventresca (Dr. Stephen Byrd) Department of Education

Literature on Spanish programs express that students who have experience with a second language develop deeper language skills and become more culturally responsive. However, students with autism are often not in Spanish programs because their curriculum is focused on developing vocational and more basic skills. Students with autism often have iPads to assist their learning, such as word to speech technology. The purpose of More Than Learning Spanish (MTLS) was to investigate how students with autism best learn Spanish using iPads resources. Students with autism were taught Spanish lessons with Ipads two times a week for six weeks at a local school. In addition, a video tutorial was created that includes Spanish vocabulary exercises, grammar, book recommendations, and activities for teachers to use in their classrooms based on MTLS. Students were videoed and assessments were used to inquire into their gained knowledge of Spanish and different types of Spanish culture through the program. Socrative was used to ask questions before and after every lesson. Growth was measured by looking at how many more answers students answered correctly after each lesson. Both observational and quantitative data (measurements of how accurately students complete activities) were taken from the experiment. The findings seem to show students with autism that are exposed to the Spanish language in various forms were able to further understand their own culture and English language. In addition, the video created from MTLS will help educators further understand the abilities of

students with autism and promote culturally responsive teaching. It is hoped that these resources will direct teachers who are not explicitly Spanish teachers by providing access to basic Spanish resources as needed. Also, these videos within the portfolio include how iPads can be implemented to better student learning when teaching language.

English

Evaluating and Improving First Year Awareness Of, Attitudes Towards, and Accessibility to The Elon University Writing Center

Rachel E. Cole (Dr. Julia Bleakney) Department of English

For my research project, I measured levels of awareness that first year students at Elon have about the Writing Center. There was no research that shows Elon first years' perceptions of their Writing Center, and the WC will use this data to determine which types of intervention are most helpful in informing students about the Center. I identified four different sections of classes that include first year students only, COR 110 and Elon 101. Each class received a level of initial exposure to the WC. Before each level of exposure, I surveyed the classes about their level of knowledge of and attitudes towards the Writing Center. Another survey was administered at the end of the semester, seeking to measure if the level of exposure made them feel more comfortable making appointments and whether they felt motivated to visit the Writing Center. We compiled data from the Writing Center's appointment system to determine if the students used the Center after receiving their level of exposure; to do this, I calculated the number of appointments the students made before and after the exposure, and if they made an account to sign up. There were four levels of exposure: the first was an in-house visit to the Writing Center where students were able to walk around and meet the director of the Center. The second was having a consultant go into the class and give a presentation about the Writing Center. The next was the teacher making an announcement about the Center, and the last was a control group. Overall, the group that had the in-library visit with a presentation administered by the director of the WC yielded the highest increase in visits, as there was a 100% increase in student visits (3 visited the center pre-intervention, 6 visited post-intervention). The in-class visit yielded two more students going to the Writing Center, while the teacher announcement yielded the same amount of students who visited before and after. Ultimately, the most "intense" exposure yielded the strongest results. This information will be used to shape the way the Writing Center markets in the future.

Thinking like a Feminist: A Study on Persona Poetry and Subversive Women Throughout the Course of the Feminist Movement

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

The research I am conducting focuses on cultivating a better understanding of important women within the history of the feminist movement through the medium of persona poetry. By using this medium, I will be able to present a more personal look into the mindsets of these women, hopefully quelling the myth that the feminist movement remains disorganized because of the scope of interests and diversity present within the movement. The poems I intend to write will

culminate in a full poetic collection (around 40 poems) aiming to promote dialogue through thought-provoking, beautiful, and historically accurate poetry. I intend to focus on Mary Wollstonecraft and Simone de Beauvoir, as well as two more contemporary feminists. I believe this project holds particular significance due to the popularity of persona poetry within contemporary poetry. Preserving the legacy of these impactful, historic women through empowering poetry remains an integral part in aiding young women to own their influence in this modern era. I believe this collection will resonate with a younger generation due to its accessibility. Hopefully, this collection will also work to humanize these women in the eyes of individuals who do not agree with the objectives of the movement, facilitating their understanding of these women as strong, capable individuals pushing towards significant social change. I started my research this past summer pertaining to Mary Wollstonecraft through the SURE program and have completed her set of poems this past Fall. I have taken a bit longer than ideal with the research on Wollstonecraft, as she has served as a guinea pig for how the process of research transcribing into creative work will ultimately be conducted. I read both primary texts written by Wollstonecraft and secondary biographical texts written about Wollstonecraft, which is my intention for researching the other feminists as well. I am also studying poetic technique, specifically the art of the persona poem, through a variety of works.

From Shame to Empathy: Why We Need Stories to Survive

Emily G. DeMaioNewton (Professor Drew Perry) Department of English

My research focuses on stories and narrative as ways to lessen emotional isolation. Shame is the fear that we are unworthy of belonging; it is a fear of disconnection. Sharing narratives generates empathy, and generating empathy alleviates shame by showing people they are not alone in their experiences. Humans use narrative to construct meaning in the world, and it's possible to use narrative to *reconstruct* meaning in a more positive way—a way that is easier to contend with, at least. Constructing and reconstructing narrative serves as a base for developing identity, building relationships, a variety of therapy techniques, and even memory. My presentation will feature a reading of a short story I wrote as part of this creative project, based in the idea that reading narratives in which readers see articulated an emotional experience they've had, but never known anyone else had before them, makes people feel less alone and more resilient.

“We Create Our Own Reality”: The Nuances of Power, Mental Health, and Reality in Young Adult Literature

Nicole L. Galante (Dr. Megan Isaac) Department of English

Representations of mental illnesses that impair perceptions of reality in young adult (YA) literature are on the rise, and they offer a unique opportunity to examine the nuances of power in the genre. Psychological research into the topic of reality has established that it is not a fixed concept. Hood (2013) explains that reality is socially constructed: we have “no direct contact with [it]” (p. 3). Everyone experiences slight variations of reality, and no one variation is more or less real than another—no matter how extreme. This theory of reality is intriguing when considered in the context of mental illness. Variations of reality for mentally ill individuals are often extreme and deviate from the accepted norm, the “dominant reality.” However, because

reality is socially constructed follows that extreme deviations are not false. Rather than experiencing false realities, mentally ill individuals experience “alternate realities.” Because mental illness can affect how young adults experience power, alternate realities are the subject of an emerging set of YA novels. YA theory establishes that the genre’s most notable characteristic is its use of power when crafting narratives about adolescents. Despite the overwhelming presence of power in YA novels, renowned critic Roberta Trites notes that the term “power” is complex and requires further definition. Three novels in particular—*Challenger Deep* (2015) by Neal Shusterman, *Going Bovine* (2010) by Libba Bray, and *Where Things Come Back* (2012) by John Corey Whaley—showcase the need and the ability of the genre to delineate precise definitions of power. Each features a protagonist with mental health challenges that impair their perception of reality. Within these novels exist two realities, the dominant and the alternate, and consequently two distinct forms of power: actual power and perceived power. The gap between these two types of power is central in developing the plot and themes of each novel. The tensions between dominant and alternate realities and the powers that come with them demonstrate a need for YA literature theory to expand its conceptions of power to include the specific variations that exist for mentally ill characters who may live in dominant and alternate realities simultaneously.

Looking Beyond the Classroom: Responding to Educator Needs in Linguistically Diverse Schools

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

This Leadership Prize project seeks to understand--and respond to--the everyday challenges of teaching linguistically and culturally diverse students. As a result of an increasingly globalized society, people are crossing borders and communicating with those far away more than ever before. 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. 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). 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 works with local Alamance Burlington School System teachers, administrators and staff to create a community of practice that explores the pedagogical challenges they face and enacts local solutions. In the first phase of this project, I am using the institutional ethnography method to interview teachers, administrators and staff at Williams High School to identify the most significant challenges they face when working with ELL students. In the next phase (Fall 2018), I will lead working groups with ABSS staff to work collectively to recommend solutions and begin to take action. Finally, the Leadership Prize will enable me to convene a TESOL Colloquium at Elon and invite local educators to share their work with Elon students and faculty, continuing the collaboration. This project will be implemented over the next year and a half to create a valuable community of practice here in Alamance County of individuals empowered to create change.

Donald Trump's Twitter Rhetoric during the Russia Investigation

Jessica L. Mohr (Dr. Jessie Moore) Department of English

This project rhetorically analyzes President Donald Trump's tweets during, and in response to, the FBI's investigation into Russian interference with the 2016 U.S. presidential election. I specifically focus on his posts to Twitter in response to a specific aspect of the investigation, James Comey's testimony(ies) before Senate committees, in order to evaluate how America's hybrid political media system informs what the public is aware of when significant events transpire in their nation's leadership, specifically through President Trump's rhetoric on Twitter. This topic is important and timely given the controversy surrounding the alleged involvement and compliance of the President and his family/staff with Russian interferers. Rhetorical discourse analysis of the President's tweets and mainstream media coverage of the same events mentioned in the chosen tweets demonstrate bias and potential redirection on the part of the President. To bolster my understanding of the existing climate surrounding these topics, I grounded this research in existing studies on Twitter in countries with similar democratic and media systems, including "Styles of Social Media Campaigning and Influence in a Hybrid Political Communication System" by Karlsen & Enjolras, and "Twitter Bites and Romney: Examining the Rhetorical Situation of the 2012 Presidential Election in 140 Characters" by Janet Johnson.

Some Boys Speak Up: The Function of the Male Love Interest in Young Adult Rape Novels

Molly Y. Spero (Dr. Jean Schwind) Department of English

Sexual violence is an important and pervasive problem in American culture, and young adult (YA) literature is an age-appropriate vehicle to confront it (Wood, 2010). Laurie Halse Anderson's *Speak* (1999) is widely regarded as a groundbreaking work for its candid depiction of rape (Jackett, 2007), and it gave rise to a new subgenre in YA literature: stories about survivors and perpetrators of sexual violence. Scholarship about *Speak* focuses on classroom teaching of the novel (Cleveland & Durand, 2013); rape myths that cast doubt on victims' claims (Malo-Juvera, 2012); and the protagonist's silence (O'Quinn, 2001). However, the impact of hegemonic masculinity on the attitudes and behaviors of male characters in this novel has attracted little critical attention. A chapter of a larger research project on the representations of rape myths in young adult fiction, this study focuses on a character that has become a staple of post-*Speak* YA novels: the male love interest of the female protagonist. Romance quickly emerged as a major plot point in this subgenre. A content analysis of twenty popular YA novels about sexual assault published between 2000-2016 revealed that 18 prominently featured the development of a new male love interest. Two patterns emerged from examinations of this character: 1) he belongs to an out-group, defined by notable departures from traditional masculine norms, or 2) he belongs to an in-group, defined by conformity to those norms (which he will gradually question and disavow). Two novels vividly illustrate these patterns: *The Mockingbirds* (2010) by Daisy Whitney features an out-group love interest; *Some Boys* (2014) by Patty Blount features an in-group love interest. Overall, the function of this character is to redefine masculinity in a way that subverts the gender binary. As a result, male love interests in

YA novels about sexual assault represent positive male behaviors and attitudes to young, predominately female readers who are learning to navigate sexual experiences and expectations. Male love interests reject the toxicity of hegemonic masculinity and provide an alternative, egalitarian model of romantic relationships.

Til Death Do Us Part: A Feminist Analysis of Ama Ata Aidoo's *Anowa*

Alexis M. Williams (Dr. Prudence Layne) Department of English

In contemporary society, the discussion of feminism has become more nuanced and expansive than ever before. Whereas, in the past women's rights have often meant wealthy, Caucasian women's rights, understandings of intersectionality and inclusivity have made room for multiple feminisms. This broader scope for feminism has been especially important when discussing gender in non-western countries like those within Africa. Though well intentioned, a number of past critics have approached gender inequality in African countries as though African conceptions and interpretations of gender were North American or European. More contemporary researchers and scholars have recognized the faults in this sort of generalized view of feminism and understand that African feminists confront issues that can only be understood in an African context. African feminists also recognize this distinction and the importance of defining what feminism looks like in their own countries. This research will specifically focus on Ghanaian feminism and how it confronts gender expectations in its mostly patriarchal system. Through the work of Ghanaian writer Ama Ata Aidoo, this essay attempts to explore the role of patriarchal ideals in Ghanaian marriage, specifically as it is represented in one of her most popular plays, *Anowa*. Though some critics argue that marriage is not necessarily a hindrance to equality of the sexes, Ama Ata Aidoo's exploration of the female experience in Ghanaian marriages through *Anowa* illustrates the negative outcomes that can result from the intermingling of feminism and the Ghanaian patriarchy.

The White Gaze on "Black Theatre": How the Perception of the White Mainstream Reinforces the Reproduction of Minstrelsy on Broadway

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Broadway, like many American creative outlets, is dominated by the work of white men. As such, the instances of award-winning plays written by African Americans, or plays produced on Broadway, are often rare. The goal of this two-year Lumen research has been to examine what Broadway and its audiences seek from plays by African American playwrights. Scholars and writers from W.E.B Du Bois to Suzan Lori Parks have worked to define "Black Theatre," its features on stage and how black playwrights situate themselves in the canon. This presentation hypothesizes how the persistence of easily consumable images of blackness, appeals to white empathy and emphasis on universality have contributed to the success of mainstream commercial plays by African Americans. More specifically, this work focuses on *In Dahomey*, *A Raisin in the Sun*, and *Fences* in order to understand how traditions within those plays have influenced its success. Through textual analysis and the incorporation of relevant secondary criticism, this research illuminates limitations imposed on African American theatre and the ways African American writers have interacted with those limitations.

Environmental Studies

Assessing the Effect of Citizen Science on the Environmental Attitudes of Participants

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In recent decades, citizen science (CS) has been used as a tool to help environmental scientists collect data efficiently, as well as to get citizens involved in and educated about environmental science. However, one question that remained unanswered is whether or not citizen science has the potential to change the environmental attitudes (EA) of the participants. This study aims to address the lack of research on this topic. CS participants were asked to answer a 31-question survey, seven of which were about their participation in their CS program and 24 of which assessed their EA. These questions were taken from the Environmental Attitudes Inventory, a balanced survey that measures EA on 12 scales (Milfont & Duckitt, 2010). The 24 questions were organized as pairs, each addressing a specific behavior or attitude from both a positive and a negative perspective. CS participants came from a range of CS programs across the US, each with different foci and levels of participation. The survey gathered data on participation factors such as contact hours, hours in a group setting, and how much training or education they received pre-participation. It was expected that an increase in any of these variables would also result in an increase in EA. The control group consisted of people who were interested in CS programs or environmentalism, but had not yet participated in a CS program. This group answered the same survey without the questions on participation. Final data for this study is still being collected and analyzed, but preliminary results from nine CS organizations suggest that there is a difference in EA between participants and the control group. Compared to the 33 CS participants, the 14 survey respondents in the control group had significantly different answers on four pairs of questions plus one question (9 total) of the 24 questions. Further analysis will hopefully reveal more about the CS participation effect and provide a better understanding of what variables, if any, are important in changing participant's EA.

A Comparison of Salinity-Induced Thermoprotection of Photosystem II in Three Coastal Wetland Plants

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Abiotic components of coastal wetland systems are considered highly stressful for most angiosperms (flowering plants). Resident plants must contend with periodic flooding, low-oxygen soils, sand burial, high saline conditions, and high summer temperatures. Plant physiological behavior towards multiple stressors is poorly understood and may result in intensifying stress responses, where the effects of stressors are additive, or offsetting responses, in which one stressor neutralizes the effects of another. Therefore the purpose of this study is to consider the interactions between salinity and temperature in three coastal wetland plants (*Spartina patens*, *S. alterniflora*, and *Juncus roemerianus*). In an experimental microcosm study, plants were acclimated to different salinities (0, 15, 30, or 45 psu). Afterwards, plants were heat-shocked at selected temperatures (ambient, 40, 45, or 50°C). Chlorophyll *a* fluorescence was monitored on leaf tissues as a non-invasive tool used in characterizing perturbations in photosystem II (PSII). Common markers used in fluorescence studies to identify changes in PSII

include potential quantum yield (F_v/F_m), effective quantum yield ($\Delta F/F_m'$), and chlorophyll *a* performance index (PI_{ABS}). Preliminary findings from this study suggest that individually elevated temperatures or high salinities promoted declines in quantum yield. However, when these stressors were combined, the higher salinities appeared to foster enhanced thermotolerance in *S. alterniflora* and *J. roemerianus* as evidenced by smaller changes in F_v/F_m and $\Delta F/F_m'$ with increasing heat shock temperature at salinities of 30 and 45 psu (compared to 0 and 15 psu). Similar trends were also observed in PI_{ABS} , however, thermotolerance behavior diminished at 50°C. This thermoprotective response was most pronounced in *S. alterniflora*. The findings from this study may help provide new insights into how coastal wetland plants may respond to higher summer temperatures attributed to climate change.

Patterns in Hybridization Between Native and Invasive Species

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Human activity is driving the rapid movement of species around the globe, both directly through human-facilitated movement and indirectly as a consequence of climate change. In addition to the direct harm they inflict on native species through predation and competitive exclusion, introduced species can also impact native species through hybridization. Here, we have examined global hybridization events between native and non-native animal species to determine biological, temporal, and geographic patterns in hybrid zone formation. Using Web of Science, we identified 52 cases of hybridization between native and invasive species published between 2011 and 2016. Our results have identified clear taxonomic patterns, with the largest numbers of studies focusing on fishes, and geographic clustering of hybrid zones in the United States, Europe, and Japan. This work also reveals significant gaps in our knowledge of invasive species and the natives that they affect. Specifically, current geographic distribution data are unavailable for many of the species included in our study. Furthermore, 42% of natives and over 50% of non-native species, including two of the most studied invasives – the Mediterranean mussel *Mytilus galloprovincialis* and rainbow trout *Oncorhynchus mykiss* – were unassessed by the IUCN Red List. Because the IUCN Red List is the world's most comprehensive record of species conservation statuses, the lack of data on these species means that we do not know the full risk associated with them and cannot institute appropriate management practices. Our work has clear implications for global impacts of invasive species through the risk of genetic introgression, or back-and-forth mating between species. This paper also uncovers aforementioned gaps in hybridization research that, due to our quickly changing world, must be addressed soon to ensure the success of current conservation efforts.

Exercise Science

Examination of the Availability and Effectiveness of Social Support Systems Following a Concussion in Collegiate Student-Athletes and Dancers

Ian R. Heaton (Dr. Eric Hall & Dr. Caroline Ketcham) Department of Exercise Science

Individuals who sustain a concussion experience a range of physical and mental changes. The research on concussive injuries has primarily focused on the physiological changes. The mental and psychosocial aspects of recovery are not as well documented. Social support has been shown to positively impact injury recovery, however, due to the “invisible” nature of concussions, greater social support may be more critical compared to “visible” (e.g., orthopedic) injuries. The purpose of this study was to qualitatively evaluate the concussion recovery experiences in regards to resources and social support in collegiate student athletes. Sixteen participants (6 club, 7 varsity, and 3 dance) discussed their concussion recovery experience. Each participant self-reported being symptom free at the time of the interview. Questions included how the injury occurred, recovery duration, personal social support systems, and perception of lack of support. Each interview was recorded and later transcribed to determine themes. Participants had similar responses within five primary themes: all participants described social support as a response rather than a continuous development; all participants stated that face-to-face support was the most beneficial to them compared to virtual; the majority of participants said that their athletic trainer had the most significant impact on their recovery in terms of emotional, informational, and instrumental support; informational support is mainly influential if it is the athlete’s first concussion; and most participants noticed a behavioral change of their peers. It is clear that social support can positively impact an athletes’ concussion recovery, which indicates that it should be included in treatment protocols. This study could promote the development of other qualitative concussion research studies, which should include differences across gender and sport. Not all universities have athletic trainers for their club sports and dance programs and this study demonstrated the value of that support.

An Assessment of Clinical Measures of Postural Control in Pre-Professional Dancers

Rachel A. DiCioccio (Dr. Matthew Wittstein) Department of Exercise Science

Lack of postural control at the core may lead to abnormal limb positioning and subsequent injury in pre-professional dancers. Onset of fatigue during training alters neuromechanics of the lower extremity, and decrements in postural control and balance exacerbate the risks associated with fatigue. Dancers have high injury rates with 30% of collegiate dancers experiencing an injury each semester, and 85% of professional dancers experiencing one major injury per year; therefore analyzing factors that contribute to injury is important in dance medicine. The purpose of this study was to measure postural stability of dancers in four different positions on stable and foam surfaces with eyes open. Balance tests were performed on 12 female participants, with center of pressure path length and ellipse area measured using a force plate during 20 second balance trials. A 2 x 2 (position x surface) ANOVA was used to test for differences between positions and surfaces, with alpha set a priori to 0.05. Significant main effects were identified for both position and surface for ellipse area ($F=12.37$, $p<0.001$; $F=8.04$, $p=0.006$, respectively) and path length ($F=22.82$, $p<0.001$; $F=10.25$, $p=0.002$, respectively). Tukey post-hoc testing revealed that balancing in relevé resulted in ellipse areas (mean \pm SD; 0.00051 ± 0.00034 m²) and path lengths (mean \pm SD; 2.55 ± 0.77 m) significantly different than all other positions ($p<0.01$). Both path length and ellipse area were lower values in relevé, meaning dancers may have balanced with more ease in this position. Path length was also different in arabesque than in retiré ($p=0.0109$; 4.47 ± 0.99 m; 3.71 ± 0.96 m, respectively). Dancer response to loss of balance may be telling of neuromuscular control while dancing in a

fatigued state, so clinical balance tests should focus on positions that challenge dancer limits of stability. The arabesque condition seems most challenging, demonstrated by greater path area and path length, and may therefore be more useful than relevé, retiré, or front attitude for identifying balance deficits in dancers. Future studies should focus on other parameters of balance, such as mean center of pressure velocity.

Academic Confidence and Grit Predict Mindfulness in Collegiate Student-Athletes

Brigid M. Brennan (Dr. Caroline Ketcham and Dr. Eric Hall) Department of Exercise Science

Mindfulness includes the ability to be attentive and aware of present events and experiences without making judgments based on prior beliefs (Zoogmen et al., 2014). There is evidence that mindfulness is related to grit (determined by perseverance and an ability to remain invested in one's goals (Duckworth and Quinn, 2009)) and academic performance, but has not been well studied in the collegiate athletic population. Previous studies have not addressed predictors of mindfulness in sport classification (as identified by the NCAA). **PURPOSE:** The purpose of this study was to determine if grit, academic confidence, and demographic factors were predictive of mindfulness in collegiate student-athletes. **METHODS:** 334 (19.6 +/- 1.2yrs; 184 male, 150 female) varsity student-athletes completed the Mindfulness Attention Awareness Scale, Academic Confidence Scale and short grit scale as part of baseline concussion testing protocol prior to their respective seasons. Of the participants, 169 were classified as contact and collision student-athletes (Football, Lacrosse, Soccer), 73 as contact student-athletes (Basketball, Baseball, Softball), and 92 as limited contact student-athletes (Cross-Country, Track and Field, Tennis, Golf, Volleyball). A stepwise multiple regression was conducted to determine if gender (step 1), age (step 2), sport type (step 3), grit (step 4) and academic confidence (step 5) were predictive of mindfulness. **RESULTS:** Steps 1-3 displayed no significant change in R^2 (gender, age, and sport type, $R^2=0.014$, $p>0.05$) The addition of grit and academic confidence significantly increased R^2 (grit: R^2 change=0.130, $p<0.001$; academic confidence: R^2 change = 0.015, $p<0.05$). **CONCLUSION:** Demographic information including age, gender and sport classification do not significantly predict the variance of mindfulness (1.4%); however the addition of Grit and Academic Confidence accounted for 15.8% of the variance in mindfulness. Results suggest that the relationship between mindfulness, grit, and academic confidence is important in collegiate student-athletes. Future research should consider how training in mindfulness impacts performance and confidence on and off the field of play.

Evaluating the Effectiveness of Applying Grief-Response Models to Sport Injury in Collegiate Student-Athletes

Sydney N. Brown (Dr. Eric Hall) Department of Exercise Science

For an athlete whose identity is contingent upon their participation in sport, an injury that forces them to cease participation can represent a significant loss. As a result, grief models are often applied to the context of sport injury. However, most models are outdated, and little empirical research has been done to test their applicability to sport injury. This research sought to evaluate the effectiveness of grief-response models in describing emotional responses to injury among NCAA Division I student-athletes and investigate the role of social support in determining their

emotional responses. Fifteen current and former student-athletes (10 female, 5 male) across five Division I sports at Elon University participated in this study by completing a semi-structured interview regarding the individual's injury experience. Athletes most frequently reported feeling upset during the injury diagnosis stage. For those whose injury required surgical intervention, their top reported emotional response during that time was anxiety or fear. Frustration was the most commonly expressed emotion during the rehabilitation stage. Finally, in returning to play, the top emotional response reported among participants was nervousness/anxiety. Regarding social support, participants reported one or both of their parents as their greatest source of social support, while coaches were the primary source that the student-athletes wished they had received more support from. Preliminary findings suggest that grief models should redirect focus from shock and depression and be reworked to account for the prevalence of anxiety and frustration in multiple stages of recovery. Additionally, results identified a need for increased availability of social support resources on campus, as well as, training for coaching staff on how to better meet the expectations and needs of injured athletes.

Machines versus Free Weights: Does Exercise Mode Influence the Psychological Responses?

Daniel J. Cavarretta (Dr. Walter Bixby & Dr. Eric Hall) Department of Exercise Science

Resistance exercise reduces the risk of chronic disease and promotes numerous health benefits. Due to the low rates of participation in resistance exercise, research is needed to determine how to create a more positive affective response from exercise. A focus on creating a more positive affective experience during aerobic exercise has been shown to increase rates of adherence. **PURPOSE:** To compare the affective responses of performing resistance exercise on machines (MA) and free weights (FW). **METHODS:** Novice lifters completed a MA workout consisting of the leg press, row, chest press, and leg curl and a FW workout consisting of a goblet squat, row, bench press, and stiff leg deadlift. Each exercise was performed at 80% 10RM for 3 sets of 9-11 repetitions with 90 secs of rest between each set. Feeling Scale (FS) and Felt Arousal Scale (FAS) were assessed before exercise, after the completion of the 7th repetition of the 2nd set of each exercise, after the 3rd set of each exercise, immediately after, 30 minutes after, and 60 minutes after. **RESULTS:** Repeated measures ANOVA from before to after exercise revealed a condition x time interaction for FS where FS in the MA condition increased immediately and 60 minutes following exercise, there was no change across time for FW, and FS for MA was significantly higher at 60 minutes following exercise than FW, $F(3, 51) = 3.26, p = 0.040$. For FAS before and after exercise, FAS significantly increased immediately following exercise and then decreased to below exercise levels at 30 and 60 minutes regardless of condition, $F(3, 51) = 11.91, p < 0.001$. **CONCLUSION:** The more positive affective response from the MA workout immediately and 60 minutes after exercise suggests that MA exercises may be better for novice lifters when beginning a resistance training regimen. This may help improve long-term rates of adherence to resistance training programs.

The Effects of Caffeine on Sugar Intake, Taste Perception and Metabolism

Keely M. Collins (Dr. Svetlana Nepocatych & Dr. Takudzwa Madzima) Department of Exercise Science

Caffeine is found in numerous foods and beverages worldwide. The effects of caffeine on performance have been studied extensively, however, less research has examined the relationship between caffeine dose and taste perception or metabolism. **PURPOSE:** The purpose of this study was to evaluate the effects of caffeine on taste, sugar intake, metabolism, perceived caffeine amount and appetite profile. **METHODS:** Five college students (age: 21 ± 1 yrs; BMI: 23.9 ± 3.3 kg/m²) completed the study who were regular coffee consumers. Participants reported to the laboratory fasted for two testing sessions separated by at least 48 hours. Resting metabolic rate (RMR), resting blood pressure (BP) and heart rate (HR) were measured. Appetite profile, mood, and alertness were measured before, at 0, 25 and 45 minutes after consumption of a test drink with or without caffeine. In addition, after consuming the test drink, participants were asked to complete palatability and perceived caffeine amount questionnaires before and after sugar was added. Thermic effect of a drink (TED) was measured at 25 minutes after test drink was consumed. Oxygen uptake (VO₂), respiratory quotient (RQ) and RMR were measured. **RESULTS:** There was no significant difference ($p > 0.05$) in sugar intake between test drinks with and without caffeine (8.3 ± 6.0 g) and (3 ± 2.5 g) respectively, however, sugar intake was higher for test drink with caffeine. Additionally, the perceived caffeine amount was higher for the test drink with caffeine and approached significance ($p = 0.07$). Perceived sweetness was significantly higher ($p = 0.034$) for the test drink with caffeine while bitterness showed no significant difference ($p > 0.05$) between the two test drinks. There was no significant difference observed ($p > 0.05$) for VO₂, RQ and RMR between the two test drinks. **CONCLUSION:** Preliminary results suggest that the test drink with caffeine elicited higher sugar intake and perception of caffeine amount. Although, when more sugar was added perceived bitterness did not change between the two conditions. Therefore, caffeine may affect sweet taste perception and lead to increased calorie intake.

Perspectives of Parents and Volunteers of Special Needs Children in Youth Sport Programs: Striking Down Barriers

Sara E. Corning (Dr. Caroline Ketcham & Dr. Eric Hall) Department of Exercise Science

Participation in sports provides the opportunity for children to improve cognitively, physically, and socially (Russell et al., 2000). Sports programs can be utilized to benefit areas that have been identified as important by families of children with special needs (Rosenbaum & Gorter, 2011). Volunteers/coaches of special needs sports leagues play a significant role on the child's development (Shields & Synnot, 2016). The purpose of this study was to explore family experiences and expectations in sport leagues specifically targeted to special needs children, and the relationship to volunteer/coach training. Two different online questionnaires (parent $n=64$, volunteer $n=99$) were distributed. Parent questionnaires included demographic, function and quality of life components as well as open ended questions around motivation to join programs, expectations, challenges, role volunteers/coaches play, and barriers of program involvement for their child and family (Shields & Synnot, 2016). Volunteer questionnaires included demographic information, motivation to volunteer, experience, expectations, challenges and training (Shields & Synnot, 2016). Preliminary results showed that 50% of parents expected the program they were involved in to help their child improve physical skills and 30% said for their child to develop socially and that programs would be inclusive. Seventy seven percent said these

programs met expectations with 38% citing volunteers/coaches as being influential. However, parents did name addressable reasons for discontinuing their child's participation including atmosphere being too high of a sensory load, inappropriate skill level, and organization of volunteers/coaching. About 24% of volunteers said they would advise their friend about to begin volunteering with this population to have a positive attitude, with 28% advising them to be patient and 30% to treat everyone "normally". These results help identify differences in expectations around training and experiences between parents and volunteers. Improving aspects such as organizational structure of leagues, accessibility, and ensuring appropriate expectations are all areas that could be incorporated into a volunteer training protocol. This could be implemented to benefit the children and their families who are involved in these special needs youth sport programs.

Unilateral Fatigue Has No Effect on Leg Stiffness

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INTRODUCTION: When humans run, hop, and jump, the entire leg exhibits a spring-like characteristic known as stiffness. Generally, leg stiffness is quantified as peak vertical ground contact force divided by the change in vertical leg length of the whole leg. It is believed that too much or too little leg stiffness in gait and running can lead to injury, making leg stiffness a worthwhile field to investigate. One area that previous studies have examined is the link between fatigue and stiffness. Results from these studies are conflicting and inconclusive. Therefore, the purpose of this study was to understand how unilateral fatigue can change leg stiffness and explore how this change could relate to injury. **METHODS:** Seven participants (4 females, 3 male) aged 20.8 ± 1.63 participated in this study. Participants had 40 reflective markers placed on their body for motion capture. Participants then ran approximately 10m at their preferred speed and struck a force plate with one foot during their natural run. Participants did this five times for each foot. This was the pretest. The participant's right leg was fatigued using a unilateral leg press exercise until they achieved a self-assessed score of 8 out of 10 on the rating of fatigue (ROF) scale. A 10m posttest run, consisting of ten trials, was then completed. **RESULTS:** The participants' leg stiffness on each leg was calculated by dividing the peak vertical force ground contact force (obtained from the force plate) by the change in vertical leg length (obtained from motion capture). No differences were found between the pretest leg stiffness and the posttest leg stiffness ($p > 0.05$). **DISCUSSION:** With no changes in leg stiffness as a result of unilateral fatigue, it is possible that neuromuscular compensatory mechanisms are at play. Although initial results show no changes, analysis of other aspects may yield significant findings. The intended application of this study was to study fatigue and the mechanism of leg stiffness that may lead to injury. Since no differences were found in leg stiffness after unilateral fatigue, future studies may consider actually working with an injured population.

The Effects of Transcranial Direct Current Stimulation on Age and Race Implicit Association Tests During Complex Motor Tasks

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

Humans exhibit attitudes towards groups of people different than themselves, some they may be aware of and some not so aware of. This group identity leads to stereotyping others and creating unconscious assumptions, which control human behavior (Greenwald & Krieger, 2006).

However, inhibitory control in the prefrontal cortex is critical to controlling activation of these biases (Sellaro *et al.*, 2015). It is unknown if implicit biases are amplified when engaged in a high motor load task, or if it can be mitigated by an external stimulation treatment. Engagement in a dual motor task may draw attention away from the usage of the prefrontal cortex to modulate bias (Schmader, Johns & Forbes, 2008). This project investigated if the use of noninvasive brain stimulation via transcranial direct current stimulation (tDCS) in conjunction with evidence based excerpts of the effects of implicit bias, will positively influence bias, specifically racial bias.

Twenty-one participants (age = $19.8 \pm .98$), who self-identified as white college students, completed four Implicit Association Tests (IAT), which is a computer based reaction task where participants responded to images of stimuli for age and race that were paired with words of good versus bad. Participants were randomly assigned to either tDCS stimulation (1mA□40 min) or sham (1mA□30 sec) conditions at the dorsolateral prefrontal cortex. The IAT software produced an IAT score. The first IAT participants took was a baseline followed by another IAT while balancing on a Biodex Balance System. The participants then completed training with tDCS stimulation while reading and writing reflections on a series of excerpts from literature based books while balancing on a stability ball. The written reflections were compiled as a qualitative result of how participants describe and understand their explicit biases. This was followed by a post training IAT and a one-week post training IAT. Preliminary results of the IAT showed that a high motor load has no effect on implicit racial or age bias. However, further analysis will be completed looking at separating lower and higher bias groups at baseline as well as qualitative analyses of reflection writings.

Test Setting and ADHD Influence Baseline Concussion Testing Neurocognitive Performance in Collegiate Student-Athletes

Caroline A. Kelly (Dr. Caroline Ketcham and Dr. Eric Hall) Department of Exercise Science

Immediate Post-Concussion Assessment and Cognitive Testing (ImPACT) is a widely used neurocognitive test for assessing and managing concussion injuries. There is inconclusive data on how test administration and environment influence baseline results for student-athletes. It has been well established that individuals with Attention Deficit Hyperactivity Disorder (ADHD) perform worse on ImPACT, but little research has examined the effect of group test administration on neurocognitive performance and symptom reporting in student-athletes with ADHD. **PURPOSE:** To compare baseline neurocognitive performance and symptoms of concussion scores in group versus individual administration settings in NCAA division 1 collegiate student-athletes. **METHODS:** 260 student-athletes completed two ImPACT baseline tests, test 1 was completed when they entered as first-year students or transfers and test 2 was completed this past summer. Of these participants, 205 athletes took test 1 individually and 55 participants took it in a group setting. All student-athletes took test 2 in a group setting. 21 of the 260 student-athletes had a diagnosis of ADHD. A 2 (time) x 2 (environment) x 2 (ADHD) Multivariate ANOVA was conducted. Time (test 1 and test 2) was within subjects and environment at test 1 (individual and group) and ADHD (yes or no) were between subject variables. **RESULTS:** There was a significant increase in total number of symptoms reported

when participants with ADHD went from individual testing to group testing ($p < 0.05$). There was a time x environment interaction for visual memory ($p < 0.05$). Scores increased from test 1 to 2 when both were completed in a group setting. A similar effect was found for visual motor processing speed ($p < 0.05$). Participants with ADHD performed worse on all measures no matter the setting ($p < 0.05$). Symptom scores significantly differed for ADHD participants depending on the setting ($p < 0.05$). **CONCLUSIONS:** A group setting has inherent distractions and seems to influence performance on visual memory, visual motor processing speed and symptom scores. Student-athletes with ADHD may be more affected by these distractions. This should be considered in baseline concussion testing and interpreting post-injury neurocognitive performance.

Corinne M. Kenny (Professor Lauren Kearns, Dr. Caroline Ketcham, and Dr. Eric Hall)
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Mechanisms for concussions in dance include drops from lifting, falls from stage sets, and contact with the floor or fellow dancers that happen during class, rehearsal, or performances. Despite the recent awareness of sports-related concussions, there are gaps in knowledge regarding dance-specific concussions and what a “return to dance” protocol should look like for dancers. Although dance is not a high-impact sport like football or rugby, concussions still occur and can be calamitous for a collegiate and professional dancer’s career. Balance tests, standard in concussion management protocols, are useful tools for evaluating the motor domain of balance functioning and are considered reliable and valid assessments of athletes suffering from concussions. **PURPOSE:** Develop and investigate a complex balance task series and confidence measurement to integrate into a concussion management protocol specific to dancers. **METHODS:** 31 participants, pre-professional dancers ($n=12$) and recreational dancers ($n=19$), completed a multipart evaluation to assess static and dynamic balance. They were tested using the Balance Error Scoring System (BESS) test which assessed static balance through performing 3 stances on 2 surfaces (ground and Airex Balance Pad). The modified Dance BESS (DBESS) test assessed static and dynamic balance of the participants through performing 10 dance movements on 3 surfaces (ground, Airex Balance Pad and foam balance beam). Participants were monitored and scored for errors on each balance test. **RESULTS:** Pre-professional dancers and recreational dancers were not significantly different for static balance on the BESS and DBESS ($p > 0.05$). There was significant difference between the pre-professional dancers and recreational dancers ($p < 0.05$) for the dynamic balance conditions in the Dance BESS. **CONCLUSIONS:** More skilled dancers show greater differences with dynamic balance conditions. Thus, creation of more dynamic balance tasks would be useful for baseline and post concussion testing and aid in the overall tracking during the concussion rehabilitation period for dancers.

Availability and Accessibility of Psychosocial Service Information on Websites of Top-Rated Children’s Cancer Hospitals

Bridget C. Krol, Sarah J. McCain, Ashley M. Moats & Francesca A. Music (Dr. Cynthia Far & Dr. Caroline Ketcham) Department of Exercise Science

Psychosocial services offered to pediatric oncology patients and families are an important part of comprehensive treatment. Families independently explore hospital websites to identify available services, and where and when they are offered. The purpose of this research was to assess the range of available psychosocial services and the ease of finding accurate and relevant information on hospital websites. Websites from the top 20 U.S. News & World Report Best Children's Cancer Hospitals (2017-2018) were examined as a first step to understanding the availability of psychosocial services for children with cancer and their families. Provider type, service type, physical spaces, and accessibility of information offered at each institution was collected. A follow-up phone call to a contact person provided on the website was then attempted for a more in-depth conversation to confirm information shared on the website and to seek further elaboration related to services. All websites were aesthetically pleasing, listed a range of services, and contact information. Counseling, child life, support groups and spiritual care were universally available, yet accurate detailed information (i.e. time/location of services) was not often shared. The majority of websites were difficult to navigate, requiring the user to click through multiple screens to find relevant information about service availability. It was often difficult to reach a contact person and when able to they were not always knowledgeable about how to connect to psychosocial service providers, time/location of services or indicated referenced website information was outdated. Patients and their families need multiple avenues to learn about the range and availability of psychosocial services. Psychosocial service information on hospital websites should be routinely evaluated for accuracy and consistency. Websites should be easy to navigate and knowledgeable contact personnel readily available so patients and families can be connected with psychosocial services that meet their needs. The participant should be able to identify the importance of having accurate and easily accessed psychosocial service information available for families on hospital websites, as well as a knowledgeable contact person for guidance.

Translating Psychosocial Standards of Care into Assessment: A Tool for Advocacy

Bridget C. Krol, Sarah J. McCain, Ashley M. Moats, and Francesca A. Music (Dr. Cynthia Fair) Department of Public Health Studies, (Dr. Caroline Ketcham) Department of Exercise Science

Background/Purpose. The Standards for Psychosocial Care for Children with Cancer and Their Families Psychosocial are well established and grounded in research. Clinical facilities aim to use standards to drive services and supports available to pediatric oncology parents and their families. However, currently there is not an easy way to assess the translation of these standards for providers, patients, and families. The goal of this project was to translate standards into assessment tools for healthcare providers and for families of deceased and surviving children. **Methods.** Online surveys and in-depth interviews were conducted with providers and parents to better understand their perceptions of the availability, accessibility and the role that psychosocial services play in the care of pediatric cancer patients and families. Modified versions of psychosocial standards were shown to providers including clinical social workers, child life specialists, physicians, nurse practitioners, nurses, chaplains and parents who offered feedback on questions and language usage. Appropriate changes were made in order to make terms applicable to a wide variety of health care providers and parents. **Results.** The language of standards had to be significantly reworded for parents. Parents appeared to struggle with

conceptualizing psychosocial services beyond those that directly affected their child. The category of “unsure” was added to service availability. Providers emphasized the importance of psychosocial supports for families although acknowledging that they do not always know what resources are, or need to be, available. **Conclusions and Implications.** Standards of psychosocial care should be adapted to a variety of audiences to better understand the scope and quality of care. Findings can be shared with decision makers to argue for additional resources. The integration of multiple perspectives add data to target specific changes to existing services. Future research can use these tools to assess family needs and translate needs into advocacy for psychosocial supports. **Learning Objective.** The participant should be able to identify how standards need to be translated to effectively assess provider and family perspectives on the availability and accessibility of psychosocial services.

The Effects of Blueberry Supplementation on Exercise-Induced Muscle Damage and Inflammation

Lyndsay J. Lee (Dr. Paul Miller & Dr. Takudzwa Madzima) Department of Exercise Science

PURPOSE: To examine the effect of blueberry supplementation (BB) on exercise-induced muscle damage (EIMD) and recovery. Reduction in muscular inflammation can aid in expedited recovery after an intense bout of exercise. **METHODS:** 17 recreationally-active women (age: 20.8 ± 1.2 yrs; body fat percentage: $23.7 \pm 5.6\%$; BMI: 24.2 ± 3.2) participated in this randomized, double-blind, matched-pairs study. Participants were matched by lean mass (LM) and were randomly assigned to a BB group or a placebo (PLA) group. At baseline, participants' body composition, thigh circumference, and leg strength were measured using bioelectrical impedance, a gulick tape measure, and determination of the individual's 1-repetition maximum (1RM) on a leg press, respectively. Participants consumed a daily dose of freeze-dried blueberry powder ($1.6\text{g BB/kg}_{\text{LM}}$) or an isocaloric placebo ($1.6\text{g PLA/kg}_{\text{LM}}$) for 7 days. Following the supplementation period, they completed 6 sets of 10 repetitions at 70% 1RM on the leg press to induce EIMD. Thigh circumference was reassessed. Perceived muscle soreness (PMS) and pressure-pain threshold (PPT) of the right front and back thigh and gluteus were assessed using a PMS questionnaire and dolorimeter, respectively. Quadriceps average power and peak torque were measured using a Biodex™ dynamometer. All these measures were taken immediately before and after (IP) induction of EIMD and 24, 48, and 72 hours post-EIMD. Saliva samples were collected during the last 4 visits and analyzed for C-reactive protein levels. **RESULTS:** There were no group x time interactions in any outcome measures. There was a time effect in PMS and PPT. PMS significantly increased IP and 24 and 72hrs post-EIMD compared to baseline (BB: 1.0 ± 1 vs 3.7 ± 5 vs 2.7 ± 5 vs 1.6 ± 2 ; PLA: 1.1 ± 1 vs 4.6 ± 6 vs 3.4 ± 6 vs 1.7 ± 2). PPT significantly decreased up to 72hrs post-EIMD (BB: 5 ± 6 vs 3.6 ± 8 vs 3.7 ± 6 vs 3.6 ± 5 ; PLA: 5.6 ± 6 vs 3.6 ± 6 vs 4.1 ± 6 vs 4.4 ± 5). **CONCLUSION:** Consumption of freeze-dried blueberry powder for 7 days prior to an intense bout of resistance exercise does not significantly affect the rating of PMS; attenuate decreases in quadriceps PPT, average power, and peak torque; nor decrease levels of C-reactive protein compared to an isocaloric placebo for up to 72hrs post-induction of EIMD.

The Impact of a Mentor Based Program on Self Esteem and Perceived Body Image in Older Elementary School Girls

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Body image dissatisfaction is prevalent among children, and can have a negative impact on mental health. Research suggests that programs need to address attitudes toward body image with older elementary school children before these attitudes become difficult to change. The Alamance Girls in Motion (AGIM) program pairs female Elon students with 4th and 5th grade girls in an effort to mitigate issues of body image and self-esteem, and promote healthy eating and physical activity using age appropriate materials and mentorship. Mentoring relationships have been associated with improved self-esteem in mentees, and mentors have also been shown to benefit. AGIM health education materials were recently updated to include more interactive and mentor led instruction on influences of body image, so the purpose of this study was to investigate the effectiveness of these updates on self-esteem, socio-cultural influences on body image, and perceived body image in both mentors and mentees participating in AGIM. Research participants were recruited from adults and young enrolled in AGIM. Eleven girls and 9 mentors completed the study. During the 7-week program, pairs met for 90 minutes to exercise and discuss identified topics in small groups using the new materials and one on one. Prior to and following completion of the program, mentees and mentors completed the Rosenberg Self-Esteem Scale (R-SE), and two subscales of the Eating Disorder Inventory (Drive for Thinness [DT] and Body Dissatisfaction [BD]). Attitude towards appearance as influenced by media/cultural sources was evaluated using the Socio-cultural Attitudes Towards Appearance Scale (SCATAS). SCATAS is divided into 2 dimensions; awareness (A) and integration (I). Similar to previous investigations, R-SE ($p=0.02$) and DT ($p=0.05$) improved in mentees following participation in AGIM. In mentors, DT ($p=0.05$) and BD ($p=0.008$) were decreased. Positive changes were only observed in SCATAS for the mentors, potentially because media influences were less salient for the young girls who had very low scores to begin with. While the program's new materials appear to be effective in meeting the goal of AGIM, a better understanding of the impact of media on body image in young girls is warranted and should be investigated further. Dual-Task Performance after Cerebellar Transcranial Direct Current Stimulation (tDCS)

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The importance of accurate cognitive performance during a complex motor task is essential for professions including athletes, police, and military personnel. Cerebellar transcranial direct current stimulation (tDCS) has been used as a low-cost, non-invasive technique to enhance performance of individuals in a variety of isolated motor and cognitive tasks but not in a dual-task. Twenty healthy young adults completed this study. A baseline dual-task was conducted with participants completing four cognitive tasks: Reaction Time (simple, choice) and Working Memory (Stroop and N-Back) while simultaneously maintaining balance on an unstable BioDex Balance platform. Each participant then received anodal ($n=10$) or sham ($n=10$) cerebellar tDCS at 1 mA for a total of 40 mA.min (~45mins). During this time, participants completed cognitive and balance training. Participants repeated the dual-task testing immediately following training, and again one week later. Results showed no differences in cognitive performance between the tDCS and sham groups ($p>0.05$). Balance continued to show

improvements during the simple cognitive tasks in the tDCS group one week later ($p < 0.05$). Overall there were limited dual-task performance improvements of cerebellar tDCS in a 45-minute training session. It is possible the dual-task was too simple or the training session too short for this population.

The Impact of Promoting Positive Body Image on Academic Performance in Adolescent Girls

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Body image is a relevant issue, particularly among adolescent girls as they become more focused on their physical appearance. As a desire for thinness increases, negative consequences have been observed, including decreased academic performance. The purpose of this study is to investigate whether education around body image and the use of supportive messaging in a school setting will improve perceptions of body image, and subsequently academic performance. Fourteen sixth grade girls were recruited from a local middle school to participate in this study during the 2nd marking period. Parental informed consent was obtained and students signed an assent form. Prior to the intervention and following its completion, participants completed the Eating Disorder Inventory (with 2 subscales, desire for thinness (DT) and body dissatisfaction (BD)) and the Social Physique Anxiety Scale for Children (SPASC) to assess perceived body image and the Academic Competence Survey (ACS) to assess confidence in science. The intervention included supportive messaging via stickers reading 'Smart is beautiful, I am beautiful' that the classroom teacher attached to science assessments (3), and a 40 m interactive lesson provided by the researcher on the importance of positive body image and body acceptance. Grades in science were collected at the end of the 1st and 2nd marking periods to assess academic performance. Science grades for the intervention group were compared to de-identified science grades for the same marking periods for 6th grade girls from the previous school year. There were no differences in measures of perceived body image (DT: Pre= 4.9 ± 1.2 , Post= 5.1 ± 1.3 , $p = 0.44$) (BD: Pre= 8.0 ± 1.3 , Post= 8.5 ± 1.2 , $p = 0.33$) (SPASC: Pre= 29 ± 2 , Post= 27 ± 2 , $p = 0.23$) or science confidence (Pre= 21 ± 1 , Post= 23 ± 1 ; $p = 0.27$) from the 1st to 2nd marking period. There were also no differences ($p > 0.05$) in science grades for the intervention group (1st marking period= $94 \pm 1\%$; 2nd marking period= $95 \pm 1\%$) or when compared to science grades from the previous year (1st marking period= $88 \pm 2\%$; 2nd marking period= $90 \pm 2\%$). It is possible that the intervention was not powerful enough to impact these measures. However, the lack of a control group and small sample size were further limitations. Given the prevalence of the issue and simplicity of the intervention, further research is recommended.

Weight Perception, Body Composition, and Dietary Practices in College Age Students

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Unhealthy weight control and dieting practices lead to many health concerns and long-term health effects, yet people continue to engage in these types of practices for one reason or another. **Purpose:** To assess the types of weight control and dieting practices, reasons for

choosing a certain practice, self attitudinal aspects of body image, exercise habits and body composition among college age students. **Methods:** A sample of 81 female and 20 male participants (age: 21 ± 1 years, body fat (BF): 22 ± 5 %) was recruited. Participants completed a demographic and dietary influences survey, Exercise Dependence Scale (EDS), Sedentary Behavior Questionnaire (SBQ), Weight Control Practices questionnaire (WCP), and Multidimensional Body-Self Relations Questionnaire (MBSRQ). For statistical analyses, participants were divided into four groups based on gender dependent body fat classifications: well above average, above average, average, and below average. **Results:** Appearance Evaluation, Fitness Evaluation and Orientation, Overweight Preoccupation, Self-Classification of Weight, and Body Area Satisfaction subscales of MBSRQ were significantly different ($p < 0.05$) among groups. Participants with lower BF% had higher satisfaction with their appearance, were actively involved in activities to maintain their fitness and content with most areas of their body. There was a significant difference ($p = 0.004$) in the WCP among groups. Participants with higher BF% engaged in more WCP and cited the following as the most common 1) cut out sweets and junk food from diet 2) increase fruits and vegetables and 3) used home exercise equipment or went to a gym/recreational facility to exercise. There was no significant difference ($p > 0.05$) in EDS or SBQ among groups. **Conclusion:** College students with highest BF% exhibited less weight gain anxiety, weight vigilance, dieting, and eating restraints. In addition, college students with higher BF% were less likely to be satisfied with their body image and engaged in more weight control practices, yet it did not necessarily translate to a healthier weight.

Effects of a Ketogenic Supplement or a Whey Protein Breakfast Meal on Metabolism, Appetite and Subsequent Energy Intake

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The satiating effects of protein and its role in energy expenditure have been compared to carbohydrates and fats. Less data exists on the effects of a high fat ketogenic supplement consumed as part of a breakfast smoothie on metabolism, appetite and energy intake when compared to a protein based alternative. **PURPOSE:** To determine the effects of whey protein (WP) versus a ketogenic supplement (KS) added to a breakfast smoothie on energy expenditure (EE), appetite and energy intake. **METHODS:** Sixteen women (age, 30 ± 11 yrs; body fat, $29.3 \pm 5.7\%$) participated in this randomized, double blind, crossover study. After a 12-hour fast, prior to consuming the test meal, resting energy expenditure (REE) was assessed via indirect calorimetry, and appetite (hunger (H), fullness (F), desire to eat (DE) and prospective food consumption (PC)) via visual analog scale (VAS). After consuming the isocaloric (450 kcals) test meal containing either 54g WP (40% kcals protein) or 52g KS (40% kcals fat), VAS on appetite was administered every 30 minutes for the 3-hour post-meal period. The thermic effect of the meal (TEM) and respiratory quotient (RQ) were assessed at 45, 105 and 165 minutes after meal completion. Blood analysis via finger prick was completed before, 60 and 180 minutes after the meal was completed in order to assess blood ketones and glucose. An ad libitum lunch meal was provided to assess subsequent energy intake. **RESULTS:** There was a significant treatment by time effect for REE (kcal/min) ($p < 0.001$) and RQ ($p = 0.002$). RQ was significantly lower after WP compared to

KS. Significant treatment ($p=0.015$) and time ($p<0.001$) effects were observed for H. A significant treatment by time interaction occurred for F ($p<0.001$). A significant time effect for DE ($p<0.001$) and PC ($p<0.001$) was observed. Blood ketones (mmol/L) and glucose (mg/dL) levels showed no significant treatment by time interaction ($p=0.201$ and $p=0.522$). A significant treatment effect was found for blood glucose ($p=0.007$). Energy intake (WP: 578 ± 282 vs. KS: 625 ± 220 kcals) did not differ significantly between conditions ($p=0.187$). **CONCLUSION:** WP appears to be more advantageous in increasing energy expenditure and positively impacting subjective measures of appetite when compared to KS.

Using a Design Thinking Approach to Target Geriatric Mobility at Twin Lakes Community

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In the geriatric community, low levels of mobility are associated with decline and deconditioning of the neuromuscular and musculoskeletal systems. The strong correlation between physical and mental health in this population emphasizes the importance of continuous effort and work to maintain quality of life within this population. Therefore, the purpose of this research is to use a wellness assessment of a geriatric population to identify health needs for future interventions. Through the integration of both physical assessments and overall quality of life, we can identify the most actionable areas within this population and design interventions to best address these needs. 68 participants living in a retirement community completed an annual wellness assessment including the following functional tests: 30 second chair stand, 30 second arm curls, two minute step, sit and reach, back scratch, 8 foot up and go, and static balance. Participants demonstrated above average performance on nearly all tasks. Initial review of the data showed that participants struggled the most with the 8-foot up and go test. Compared to previously reported data, both the women and men are on the lower spectrum of average. The mean for women participants was 6.8 seconds (5.2-7.4 average), while the mean for men participants was 6.2 (5.2-7.6 average). The 8-foot up and go task requires a combination of strength and mobility, and therefore offers an ideal starting point to develop a future intervention. This information will be used to create a future intervention at Twin Lakes that aims to target coordination, balance, and agility. After the intervention is complete, participants and wellness professionals will be engaged to determine positive aspects and areas that need to be improved to better suit the participants. This ongoing cycle will ensure continuous development of interventions that meet the needs of the community; and, our program can be integrated into the regular wellness activities within the community. Because this community's residents seem to be especially healthy, this program will be valuable prior to expanding work to less functional individuals.

Finance

Empirical Test of Weak-Form Efficient Market Hypothesis Using Representative Technical Trading Strategies

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Technical trading strategies attempt to predict future stock movements based on past price developments. Permutations of these strategies are ever evolving with several books documenting a variety of techniques. Nonetheless, there is much controversy about the ability of such strategies to generate returns above those of passive trading strategies. Some investors rely on technical trading, while many people believe that asset markets are efficient and that these strategies cannot consistently and systematically provide investment opportunities above market standards. The hypothesis of the project is that returns will vary across geographic regions (i.e. countries) because even though investors have come to allocate funds much more internationally over the last decades, domestic investors still are a crucial factor. Furthermore, the returns from the selected strategies over the last 30 years are expected to not beat market standards the same way prior research has found them to do over the first 80 years of the 20th century. To test these hypotheses, the project examines the profitability of some of the most popular trading strategies over the last 30 years, using various statistical tools to determine if the technical trading strategies examined can indeed provide superior performance. These tests were executed for three markets in different geographic regions. The results for the different samples are evaluated to determine if there are any substantial differences in the returns generated across different geographic regions. If well-known active trading strategies can consistently outperform passive strategies, this could indicate possible inefficiencies in the market. This should help draw a conclusion about the development of market efficiency regarding the use of the selected technical trading strategies.

The Gender Dynamics in Venture Capital Funding Decisions in the Us

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Venture capital is a critical source of funding for early-stage emerging firms in the startup ecosystem in the US to support those companies' growth and innovation opportunities. Yet, women entrepreneurs appear to be significantly less likely to receive funding from venture capital investors than their male counterparts, resulting in a gender gap and disparity in venture capital funding decisions. This research aims at identifying the effect of variables derived from the body of research on funding outcomes, i.e. the number of founding rounds and the total funding amount that female entrepreneurs received from investors. Specifically, effects examined include the geographic and sector distribution of startup firms with female entrepreneurs, size of the firms, stage in the venture funding cycle as well as the number and gender of investors. Based on a dataset retrieved from Crunchbase, which provides information on funding rounds, investors and startups, and using multivariate analyses, we find that female founders are underfunded compared to male counterparts and that a combination of effects examined have an impact on the funding outcome, indicating that explanatory approaches from the literature are evident in actual venture capital transactions. This research contributes to the existing body of literature by combining underlying factors from both major streams of research that appear to impact female entrepreneurs' ability to attract venture capital from investors. Research directed towards the underlying mechanisms of the gender gap has identified investor-driven explanations to shed light on biases and homophily of investors against female entrepreneurs. Entrepreneur-driven approaches, on the other hand, have focused on the demand side seeking venture capital, implying that the funding disparity is likely to be attributed to a strategic choice of female entrepreneur's to be associated with less capital-intensive businesses

and lower risk tolerance inherent in growth efforts that are accompanied by less desire for venture capital.

The Role of Venture Capital Networks in Startup Success

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Venture Capitalists (VCs) perform a vital service in our economy by providing the financing necessary for new companies to be born. Arguably more important than merely receiving funding, however, is *receiving funding from venture capitalists that can leverage network effects*. Venture capitalists typically invest alongside other venture capitalists. Network effects are created when certain investors are better informed about opportunities than others due to their personal relationships. Hochberg, Ljunqvist, and Lu (2007) find that “the portfolio companies of better networked VC firms are significantly more likely to survive to subsequent rounds of financing and to eventual exit.” Members of the venture community understand the importance of these relationships as well, though “there still remains a huge gap between how little is written and known about network effects and how massive an impact they have on value creation.” My research explores the importance of VC networks for startup success at all stages of investment. I approach this question two ways. First, I conduct more than ten interviews of current venture capitalists and founders in order to gain a qualitative understanding of the importance of networks in venture capital. These interviews focus on how personal relationships have influenced the opportunities that they see. I find that these VC are often involved in direct, personal relationships with other investors, without which they could not adequately vet sources or access new deals. I document numerous instances where these relationships led to better investment decisions. Next, I conduct original statistical analysis on network effects using the CrunchBase Pro database of self-reported venture investments. My data includes 460 U.S. based venture firms and approximately 12,000 unique investments. I construct various measures of network strength (e.g. first-degree centrality) and perform multivariate regressions in order to assess how the size and strength of VC networks affect the outcomes (e.g. eventual IPO) of their companies (ongoing).

The Impact of the Promotion/Relegation System on Financial and On-Field Performance in English League Football

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This study analyzes the financial and on-field performance of clubs in English League Football, focusing particularly on those undergoing the promotion/relegation process. This study seeks to answer three interconnected questions: 1) Do clubs’ financial behaviors change when facing promotion/relegation? 2) Do teams on the brink of promotion/relegation differ in their financial behavior compared to those who are not facing promotion/relegation? and 3) Does the impact of promotion/relegation on clubs’ financial behaviors change from league to league? While prior research has focused on the role of economics in European football, little research has been conducted that focuses specifically on the promotion/relegation system, and none since Noll (2002). As the promotion/relegation system is a critical component of European football leagues, this study will add to the ever-growing research in the field of sport finance, looking at a facet of

sport not previously studied in great depth. This paper uses comprehensive annual financial and on-field performance data from teams in the top four divisions in English League Football for the 15-season period between 2000-01 and 2014-15. Regression analysis was used to study the relation between promotion/relegation (a reflection of on-field performance) and club's financial behavior. When facing promotion/relegation, it was hypothesized that clubs would spend heavily compared to previous seasons, hoping to improve on-field performance with the goal of gaining entry to a higher, more profitable division, or avoiding demotion to a lower, less profitable one. Clubs not facing promotion/relegation, in contrast, would not show significant change in their financial behavior. Finally, it was believed that the strength of the relation between promotion/relegation and financial would be greater in higher-level divisions, with clubs showing a greater tendency to change their financial behavior in higher divisions than in lower ones. While final analysis is still concluding, initial tests found a statistically significant relation between clubs' financial behavior, including wage and transfer expenditures, and promotion/relegation.

History and Geography

The Power of Color: A Comparative Study of Buddhism in China and Japan

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Throughout different religious traditions, colors are used to signify and enhance specific religious practices and emotions within a given cultural event. This paper looks into the question of why the color red is used to represent certain religious material cultures in Buddhist traditions. This research is inspired by the recent academic trend of “material turn,” a set of methodologies that augment visual evidence in our study of the past. Through my research, I investigate the reason the color red was chosen and its function in religious ceremonies. To illustrate how the religious teaching and local culture co-influence the utilization of color, this paper compares different meanings carried by the same color in Chinese and Japanese tradition.

In addition to conventional textual and visual sources, this research also draws from the sources I collected in my field research during the Semester at Sea Program, fall 2017. The on-site experience allowed me to focus on case studies of the Potala Palace in Tibet, the Kegon school of Buddhism, and Tōdai-ji in Nara, the home of the largest bronze statue of Buddha in Japan. The information I garnered from tour guides and monks during this field trip further enrich the discussion on how the color red functioned in contemporary practice and how red is viewed in both secular and sacred contexts. East Asian Buddhist artifacts from the U.S. museum collections are applied to exemplify the application of the color red. This paper argues that red, as one of the most symbolic colors in Buddhism, embodies both the sacredness and the humble essence of Buddha. Its application in religious practices in China and Japan was profoundly shaped by the respective indigenous beliefs of Confucianism and Shintoism. Drawing comparison between the significance of red in the East Asian context, this paper contributes to the discussion on the diversity of culture and its interaction with religions.

Cybersecurity and the Vulnerability of VPNs in Contemporary China

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Western media commonly views the Chinese government as sensitive and resistant to the spread of ideas that challenge their declared policies. Thus, China uses what is popularly known as the Great Firewall to observe and censor information online. However, a survey of popular conceptions about the Great Firewall, conducted during my study abroad course in China in January 2018, demonstrates that the government's restriction of online content didn't seem to have a negative effect on people. This is due to their common use of VPNs (Virtual Private Networks) for educational, entertainment, and business purposes. Using field research data collected from personal interviews and studies on cybersecurity, this paper examines complications arising from the use of VPNs. I argue that the use of VPNs, though they may circumvent government barriers to permit access to restricted information on the internet, potentially jeopardizes the security of personal information. A recent study indicates that one out of every five Internet users in China fall victim to hackers ("Cybersecurity Made in China," 2017). Therefore, securing data is becoming increasingly significant. There are two major concerns regarding how VPNs protect users' information. One vulnerability is the IPv6 (Internet Protocol Version 6) leakage issue, relating to data leakage that is unbeknown to the user. The second vulnerability is the DNS (domain name server) hijacking, which is an attack that redirects a user to a fraudulent or malicious website that puts the user's private data at risk. Furthermore, VPNs are discouraged by the government as part of their effort to create cyber sovereignty. As a result, the tension between the government and their citizenry over the issue of censorship is increasing. Such tension further drives some users to unknowingly expose their personal data as they are more determined to circumvent government interference with any available avenue. This research, focusing on the hereto less studied perspective of VPNs, informs the ongoing discussion on the interaction between cybersecurity and government supervision. The preliminary conclusion indicates that altering awareness of security issues in China is advisable to avoid the pitfalls of unguarded VPNs use.

Examining the Impacts of Hurricane Sandy on geographic areas with different social, economic, and physical attributes -- Case Study of Ocean County, NJ and Bergen County, NJ

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On October 29, 2012, as a Category 2 hurricane, Hurricane Sandy made landfall hitting New York and New Jersey with heavy winds and rains contributing to the death of 162 individuals and causing tremendous damage to property and public infrastructure across the East Coast. The overall purpose of this study is to compare two nearby areas, Ocean County and Bergen County in New Jersey to assess how demographic and physical factors might have played roles in maximizing or minimizing the differences in the damages suffered by each. After data was collected from existing literature, government reports, and news articles, data was used to create ArcGIS maps with several data frames and layers that indicate the similarities and differences among the economic vulnerability, social vulnerability, and the location of important government buildings in Ocean and Bergen County. The study reveals that these two counties experienced a similar level of damage, however, the social vulnerability and economic

vulnerability of the two counties resulted in the areas experiencing the damage differently. Ocean County was comprised of a more racially diverse population with less than half of the population having an Associate's Degree or higher. Additionally Ocean County had a higher community hardship index, created by Rutgers School of Public Affairs and Administration, than Bergen County, meaning Ocean County experienced a longer period of power loss, a higher gasoline shortage, more residential, commercial and municipal damage, and more emergency shelters established due to the differences in hurricane impact and community preparation (Halpin). Finally, due to a much higher impact index, which is the culmination of rankings of every category studied in this research project, in Ocean County (Impact Index of 23), Hurricane Sandy has revealed the impact and social vulnerability to Ocean County over Bergen County (Impact Index of 16). While damages along the path might be similar, the social, economic, and demographic factors of an area should be considered during preparation for a natural disaster and disaster management stages.

Mapping Urban Inequalities Through Evictions in Alamance County

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In 2016, Alamance County experienced over 3,000 residency evictions, forcing over 5,000 people to move in with relatives or find alternate housing. The only state recognized homeless shelter in the county, Allied Churches of Alamance County (ACAC), has enough rooms to house 102 of such clients, but the remaining turn to homelessness. This study partners with Allied Churches and the United Way of Alamance County as part of a comprehensive assessment to input and catalog these public record eviction notices for the purposes of better understanding the neighborhoods, landlords, and situations that place residents at a higher chance of being evicted. Eviction data was collected from the county records at the Alamance County Historic Courthouse and stored in Microsoft Excel for analysis. After collecting the addresses of evictions from the data, these were plotted using ArcGIS software, a mapping software. Spatial and econometric analysis was used to examine the demographic and geographic patterns of these evictions, and calculate other factors related to distance to social services, rent due at the time of eviction, and types of complaints. In the timeframe of January 1, 2016 to June 31, 2016 evicted totaled 1026 in Alamance County. Over 60 percent of the evictions took place in the city of Burlington, and 90 percent occurred within conventional housing. The rental median was roughly \$606, \$144 less than the county median for quality housing. The average number of months in back-rent was less than two, suggesting a quick turnaround in rental properties. When mapping our evictions, our findings revealed that a non-proportionate number of evictions come from areas of concentrated poverty – that is those with a high percentage of female headed households, under 100 percent of the poverty level, and from non-white communities. For ACAC and the United Way, this information is critical to developing services that will devote more resources to keeping renting families in their homes, whether that be through increasing affordable quality housing initiatives or expanding rental or legal aid to residents who may experience a drastic temporary loss of income and may be susceptible to eviction.

Religion at Theresienstadt: Jewish Identity in Holocaust Survivors Testimonies and Autobiographical Accounts

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The number of Holocaust survivors is rapidly declining; therefore, scholars have placed a heavy emphasis on collecting personal narratives of those who witnessed the heinous crimes that were committed by the Nazis and their collaborators during World War Two. Drawing on written narratives, compiled from various authors, and oral histories, collected from the United States Holocaust Memorial Museum, this research project focusses on what survivors of Theresienstadt, a concentration camp in Czechoslovakia, experienced in their daily lives in the camp and how this influenced their Jewish identity. The analysis of these personal accounts from Jews in Theresienstadt and how they described their daily routines, camp environment, and personal experiences during the time of imprisonment highlights themes of what was important to them in day to day life and how this had an impact on their Jewish identity. Theresienstadt, one of the largest concentration camps used by the Nazis during World War Two, serves as a case study for two reasons: the diversity of prisoners in the camp and the amount of information that is available about it. The existing scholarship serves as a reference point to characterize the camp and its historical development. By using first person accounts, a special emphasis is placed on the personal perspective and memory of those who survived. This SURF presentation will focus on the findings of my two year-long College Fellows research. The analysis of both written and oral accounts point to a number of common themes among those in Theresienstadt including cultural life, health, religion as well as life before imprisonment. For example, Helga Weissova, who managed to maintain a diary throughout this period of her life, wrote both about her and her mother's health as well as how she decided to fast on Yom Kippur while imprisoned. Accounts like Weissova's provide insight into what was important to those people during their imprisonment which allows for the development of themes across a number of sources like diaries, memoirs, and autobiographical accounts. Both, the written and oral accounts, discussed aspects of individuals' lives such as where they grew up and how Nazi rule, occupation, and laws impacted their lives depending on where they were from. Daily lives in the camp, as heavily discussed by Jana Friesová in her book and Karel Hoffman in his oral history testimony include the impacts of disease, the living conditions and how Theresienstadt was constructed and managed. Themes across these written and oral narratives demonstrate what survivors deemed as important. By analyzing the important themes, such as health and food, we find that those imprisoned focused first on things that were integral to their survival.

Human Service Studies

iAct: An Active Bystander Program

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In recent years, sexual assault has become an increasingly prevalent issue on college campuses in the U.S.; one in five women will experience sexual assault during their college years. The iAct initiative is a student-led active bystander program that aims to combat sexual assault on college campuses. iAct has three components: (1) Student-led discussions that educate students about sexual assault on college campuses; (2) Instruction on how to safely and

effectively intervene in assault situations; (3) Education about students' rights concerning sexual assault (i.e., Title IX reporting). During the Spring of 2017, 15 students were trained as facilitators. They attended a four-hour training session and a one-hour refresher session prior to initiating implementation. Through collaboration with residence assistants (RAs), Health Promotion, and the Gender & LGBTQIA Center, approximately 60 students participated in the iAct initiative. A pretest-posttest design was utilized to measure the student participants' knowledge, skills, and attitudes surrounding the issue of sexual assault. Preliminary results indicated there was an increase in students' sexual assault resource knowledge following their participation in the iAct initiative; this result suggests a need for increased campus education in the prevention of sexual assault. The next phase of the initiative will expand iAct to Fraternity and Sorority Life during Spring 2018. A program expansion is expected, as well as the continuation of activities into the 2018-2019 school year.

Global Model of Practicum Student Instruction through Guatemalan Partnerships

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At Elon University, experiential learning and hands on experience is valued and students are encouraged to use their knowledge and skills in professional settings. The Practicum Away to Guatemala (HSS 382) was designed to engage Human Service (HSS) and Public Health Studies (PHS) students in professional work at human service organizations in Antigua Guatemala for 3 weeks. This study was designed to further explore the factors that contribute to positive practicum experience for students involved in international human service delivery. Forty-eight undergraduate Elon HSS and PHS students participated in the Practicum Away to Guatemala over the course of 5 years, getting experience working in organizations primarily focused on child malnourishment and people with disabilities. Over the summer of 2017, the data collected from student's assignments, surveys and evaluations were organized and analyzed. The Student Evaluation of Practicum Field Experience, an evaluation filled out after the practicum ended, was the main source of data and gave insight into the positive and negative practicum experiences of the students. Results show that orientation to agencies, hands on experience and independent work helped students benefit more positively from their practicum agency. Most importantly the data indicated that some students will benefit more than others from the same experiences. The type of agency, background of the students, group dynamics, and number of students in the cohort all have influences on the students' experiences and further research is needed to examine these individual factors.

Insiders, Outsiders, and Intermediaries: Village Health Teams' Negotiation of Roles to Provide High Quality HIV Care in Nakaseke, Uganda

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In 2001, Uganda's Ministry of Health instituted Village Health Teams (VHTs) using local community members with basic health training, as a formal part of the country's health system to increase access to community-based care, including HIV prevention and treatment services. Tensions may emerge as VHTs navigate dual roles as community members and care providers, posing challenges for quality of care and VHT retention. This study explores the benefits and

challenges experienced as VHTs utilize dual roles to provide high-quality HIV care. Twenty-five semi-structured interviews were conducted with one-third of the VHTs affiliated with a rural clinic in Nakaseke, Uganda in 2017. Interview questions focused on the challenges VHTs face in providing services and strategies for improving quality care. After translation from Luganda, the local language, and transcription, interviews were analyzed using grounded theory to identify emergent themes. The majority of VHTs were female 64% (n=16), with a mean age of 45.5 years, and 11.1 mean years of VHT work. Three themes emerged around VHTs' perceptions of their roles: community insiders, professional outsiders, and intermediaries. All VHTs capitalized upon the duality of their position, shifting roles depending upon the challenges presented. A caregiver insider role facilitated their ability to build rapport and discuss sensitive issues such as HIV with clients. As community members, VHTs leveraged existing community structures to educate clients in familiar settings such as "drinking places", where they felt comfortable. However, this intimate role posed challenges as some clients hid their status, fearful that the VHTs would break confidentiality. Their specialized knowledge allowed them to take on a more professional outsider role which offered VHTs more respect when they followed-up with patients - accompanied reluctant clients to testing, explained medication, and ensured ARV adherence. Some VHTs faced opposition, as patients were suspicious of their motives as government representatives. In balancing these two roles, the VHTs adopted a third role as intermediaries, by using their insider role to connect the community to resources and services in the formalized health care system. As countries continue to scale up HIV services in rural community settings using VHTs, supervision and training are critical so VHTs are prepared for the challenges of assuming multiple roles within their community. Ethical dilemma training is advised.

Saints Don't Cry: Clergy's Attitudes Towards Mental Health Services and Experiences of Burnout

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Clergy are frequently acting as support systems and counselors for their congregants. Pastors are as likely to be approached for help from a distressed individual as a mental health professional (Hendron, Irving, & Taylor, 2012). The emotional support role that clergy often play can lead to pastors experiencing burnout, which is defined by emotional exhaustion, depersonalization, and lack of personal accomplishment that can often lead to other mental health issues (Randall, 2013). However, clergy often have mixed perceptions of mental health services and can see psychology as a threat to biblical understanding (Powlison, 1993). Because clergy have a variety of formal education and training in counseling those with mental illness, the attitudes and perceptions of mental illness and individuals receiving mental health services fall along a continuum with some views incorporating medical perspectives and some focusing on spirituality (Payne and Hays, 2016). This study investigated the relationship between pastors' attitudes towards referring congregants for mental health services, receiving mental health services for themselves, and their personal experiences with burnout. The research hypothesized that pastors with positive perceptions of mental health services for both themselves and others will experience less burnout and pastors with negative perceptions will experience more burnout. Dominant themes from qualitative interviews indicated a need for congregation education, need for financial and staff support, and a conflict between self-care vs. congregation care. However, there was not a correlation between pastors' perceptions of mental health

services and the burnout they experienced. A closer look at these topics and potential interrelatedness may allow the best prevention and intervention techniques to be identified.

International and Global Studies

Defunding Terror: Targeting al-Qaeda's Finances

Carly J. Goldstein (Dr. Ariela Marcus-Sells) International and Global Studies Program

This project investigates al-Qaeda's various financial sources and analyzes the effectiveness of attempts to disrupt their cash flows. Al-Qaeda is not only infamous in American history but also may serve as a model for studying terrorism generally. Because al-Qaeda is globalized, with extensive literature written by scholars and the government, al-Qaeda is able to serve as a comprehensive study, allowing us to develop a broader understanding of terrorist finances generally. Despite this extensive research, there is not yet a study synthesizing al-Qaeda's funding sources to understand its implications for counter terrorism efforts. The goal of this paper is to emphasize the importance of regulating non-financial sector sources for funding. Tracing al-Qaeda's complex and multi-layered income streams, which range from the formal to the criminal and the local to the global, illustrates the futility of targeting just one or two assets. By mapping al-Qaeda's distinct funding sources, this paper argues that effective counter-terrorism requires a nuanced understanding of each terrorist group's finance sources and a correspondingly specific financial response.

Immigration and Identity: A Comparative Analysis of News Coverage in Sweden and Denmark

Courtney L. McKelvey (Dr. Glenn Scott) International and Global Studies Program

News coverage can shape public discourse, especially around important issues and events. Framing theory, as explained by scholars such as Robert Entman and Claes DeVreese, refers to the ways in which journalists choose and present information in news articles to include (or not include) viewpoints that can be influential to consumers. Although scholars have used framing theory to analyze coverage of news stories on immigration in Europe, no specific studies exist on the framing the flow of migrants who entered Europe during 2015 and later. To study the subsequent challenge of integration within countries in Europe since then, this study sought to study news coverage of immigrants and migrants in Sweden and Denmark from January to April of 2017. Although similar in many ways – geographic, political, economic, cultural – these countries have displayed remarkably divergent responses to the arriving migrants, with Sweden pledging generous support and Denmark encouraging migrants to move to neighboring nations. This study seeks to discover the specific narratives that English-language newspapers in Sweden and Denmark used in framing their coverage of the immigration crisis. Additionally, this study sought to understand how the nature of that coverage reflects popular political ideologies in each country. This study mainly relied on narrative analysis of approximately 225 articles from three newspapers published during four months in 2017. The researcher analyzed the content of the stories for a range of frames and also carried out six supplementary in-depth interviews with Swedes and Danes about their perceptions of news coverage. Preliminary results suggest that the

Swedish news articles tended to be event-driven, with journalists following public activities more than introducing original viewpoints. Danish news articles primarily covered political and societal debates about national identity. Despite differences in their approaches to immigration in general, the two most prominent frames that appeared in coverage from both countries were an identity frame and a conflict frame. Results of this research explained the practices of a specific set of news organizations, especially as they influence discussions among those participating in English-language discussions on this crucial political and social issue in both Denmark and Sweden.

Management and Entrepreneurship

Entrepreneurial Failure: Reasons, Lessons Learned and the Case for Re-Purposing Failed Start-Up Ideas

Basile Léopold Alban Terrier (Dr. Elena Kennedy) Department of Management and Entrepreneurship

It is estimated that more than 90% of all start-ups fail within the first three years. Each failure has the potential to reduce the will of entrepreneurs and investors to create and to curb innovation. The purpose of this research is to demonstrate how the study of entrepreneurial failure can aid entrepreneurs develop start-ups successfully. Entrepreneurial failure happens when the expenses of a company are so large in comparison to revenues that the company is unable to fund its operations, forcing it to shut down. I define start-ups as young innovative high growth business ventures that specialize in technologies. Research on the mindsets related to failure and on the benefits of failure for the entrepreneur on a personal level is already extensive. However, the literature does not adequately address the merits of looking at past entrepreneurial failures as a guide in the creation of new companies. This project seeks to answer the following research question: can studying past entrepreneurial failures provide a method to avoid future pitfalls in business ventures and be a source of sound original ideas? For that, I have conducted interviews with entrepreneurs of failed ventures to gain an understanding of the reasons for their business failure and the lessons that can be learned from them. I supplemented these interviews with publically available data to build four case studies as illustrations of ways entrepreneurs can turn failed start-up ideas into successful companies. For each case I focus on the business model, timing, management and aspects of the value chain and how they relate to the failure of the firm. That information allows us to identify whether an idea failed because of a flawed concept or because of a flawed application. If the execution was the issue, a case can then be made for re-using failed start-up ideas. My preliminary findings indicate that would-be entrepreneurs should study entrepreneurial failures at least as much as successful ventures when drawing ideas and gathering good practices for their own companies.

The Use of ICT to Promote Refugees' Integration

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This research explores how information and communication technologies (ICTs) impact the integration of refugees. ICTs boast many advantages to its users, including but not limited to:

information dissemination, knowledge accumulation, and communication. These provide users the opportunity to mitigate problems of time, cost, distance, and, most importantly for this research, information. Previous research has discussed the capabilities of ICTs and how it may support the integration of refugees into their current countries of residence. However, there is limited work specific to how ICTs impact the bridging and bonding of social capital, self-efficacy, and its impact on adaptability, and social inclusion in the North Carolina area. This topic is extremely important because of its timeliness in the current political environment and the great need to improve integration policies. Data was collected via survey instrument, adapted from previous research, and pilot tested to ensure content validity. The survey was administered through translators to 77 refugee participants in the Charlotte and Greensboro areas using the snowball sampling method. Data was collected and analyzed via PLS structural equation modeling. The results indicate that ICTs positively help refugees bridge social capital, while stronger IT identity helps support refugees bond social capital. Interestingly, self-efficacy positively moderates the relationship between refugees' social capital bonding and their adaptability. Meanwhile, adaptability within the refugee community positively affects social inclusion in the hosting country. These results will be useful to extend the literature and inform policymakers of strategies that could impact integration.

Marketing and International Business

An International Transformation of Produce: The Marketing of Imperfect Produce in France and the United States

Sara A. Machi (Dr. Alisha Horky) Department of Marketing and International Business

In 2014, Intermarché, a grocery chain in France, started a program to decrease waste. The program, “les fruits et légumes moches” sold produce that did not meet certain aesthetic criteria at a discount, making it more affordable. The program also increased store traffic and brought Intermarché into the spotlight. If this program were implemented in the United States, it could reduce food waste and food insecurity. In order to determine its viability in the United States, semi-structured interviews were conducted in France with program customers and the United States with similar program customers. The interviews were supplemented with an open-ended survey via Mechanical Turk (MTurk) for both populations. Theses qualitative results identified themes including a preference for natural/local foods, attractiveness of price, the importance of conversations concerning food waste (or direct experiences), and feelings of achievement or rescue when buying the aesthetically imperfect produce. A quantitative survey was created for American grocery shoppers and the results analyzed to determine the relative impact of abnormality and information regarding food waste on willingness to purchase imperfect produce. These results fill gaps in marketing literature and give insight into its feasibility, identifying differences between French and American populations and the importance of generating conversation on food waste in the United States.

Who Brands The World? Girls! How Female Artists Must Manage Their Brand to Be Successful

Mathilde Martin (Dr. Jennifer Zinchuk) Department of Marketing and International Business

From the earliest history of the music industry, women have been relegated to sexual objects, meant to please the eyes of men in the lyrics, video clips, as well as in their own presentation of themselves as artists. Research has also shown that these manifestations of sexism in the music industry negatively impacts audiences (Hurley, 1994). Lieb's (2013) brand analysis of female pop artists demonstrates the intense pressure female artists endure: they have to be intensely attractive, make their private lives publicly available, and leverage their core assets (bodies and sexual availability) beyond music into film, television, fashion, or publishing in order to establish short-term success. Men do not face these challenges (Lieb, 2013). The purpose of this research is to understand differences in how brands operate for male and female artists, and the trends in female empowerment through their brand. My research seeks to identify the ways all women in the music industry suffer from gendered constraints, and the ways successful women are able to resist the male dominance of the music industry. Moreover, my research identifies examples of women who have made a career in the music industry by staying true to their art and standing out for gender equality. To answer these questions, I am using Lieb's Lifecycle Model for Female Popular Music Stars (2013) to analyze how two successful career artists have managed their careers to achieve - and maintain - brand success over time. Initial findings from these cases suggest that female artists' path to empowerment lies in both embracing the constraints of the personal brand as well as using their personal attributes to resist brand pressures. Authenticity, boundaries, and artistic reinvention might, in fact, lead to career longevity. In addition, the public showing of their body, sexuality, and personal lives often conveys a negative message of female subordination to the audience, although artists' intent is often to promote female empowerment and to convey a feminist message to the world.

“Can Microfinance Help Families in a Hyperinflationary Environment?”: Field Research in South Sudan

Grace E. O'Hara (Dr. Stephen DeLoach) Department of Marketing and International Business

This research examines the impacts of a newly implemented Village Savings and Loan Association (VSLA) program in South Sudan on its participants' ability to save. The climate in South Sudan has only grown more volatile and life threatening to its citizens over the past two years due to the intensification of the country's civil war. Every facet of security for the South Sudanese has been threatened, including financial security as the inflation rate reached unsustainable levels, 635% at its highest, and set the country into a hyperinflationary state. As a result, families' livelihoods were threatened, as they were unable to grow or maintain their monetary assets. The few microfinance or aid organizations that typically gave out small loans in the past were forced to cease doing so as it was impossible to pay back the loan amount with interest given the exorbitant levels of inflation. However, some organizations knew that the South Sudanese people needed these services most, and so they attempted to adapt. One in particular, a non-profit microfinance institution by the name of Seed Effect decided to implement a micro savings program, moving away from their microloan program during this time. Through a partnership with Seed Effect the effectiveness of their new VSLA program was measured by pre and post financial data collection surveys developed by World Relief, and a quality of life survey developed by Seed Effect. The survey developed by World Relief includes financial data on each savings group, including number of loans, loan sizes, repayment rates, etc. The surveys

developed by Seed Effect serve to illustrate the determinants of savings, and include information on household demographics, wealth, and individual level indicators. The data were analyzed using OLS (ordinary least squares) and 2SLS (two-stage least squares) regressions to determine the factors that affect participant's ability to save. After accounting for attrition, it was found that every member of each group saved, though there is great variation of the total savings across groups. This variation can best be explained by differences in education, household wealth, and individual-level leadership roles within the group.

Not All Sponsorships Are Created Equal: Towards Further Understanding Fan Resistance to Sport Sponsorship

Helena M. Zaeh (Dr. Nawar Chaker) Department of Marketing and International Business

Scenes of soccer fans leaving the terraces shortly before kick-off, holding up banners, and verbally expressing their frustrations have become familiar to most clubs in the Bundesliga, the professional soccer league in Germany. In Dortmund, fans protested their new stadium name, Signal Iduna Park, named after an insurance company. Meanwhile, in Leipzig, Red Bull founded their own team and experiences disapproval from numerous fans. While involved fans understand the necessity of sponsorships, they seem to be particular and do not want just any organization to be associated with their favorite teams. If fans do not approve the sponsorship, they may resist, which ultimately can have harmful consequences for both the clubs and fans. Recent literature mostly concentrates on sponsorship effectiveness and success factors related to profitable partnerships, mainly taking a sponsor's perspective. Presently, minimal research exists that can be used to alert the management of sponsorships regarding potential negative reactions or even resistance from fans resulting from sponsorship selection. Consequently, there is a need to further understand the nature of fan resistance, the reasons why fans oppose certain partnerships, and the factors that determine fan resistance to certain deals. This work thus aims to extend existing research by identifying new aspects that contribute to fan resistance as well as the consequences to fans and their clubs. To develop unique insights, the Bundesliga is chosen as the subject due to its popularity in Europe as well as its increasing commercialization. In-depth interviews were conducted with eight fans in order to gain a deeper perspective. Grounded theory was used to categorize participants' responses, identify the conditions that lead to fan resistance, and determine the consequences of fan resistance. Accordingly, various dimensions of fan resistance were identified, starting with boycotts, to fans "turning their back" on their favorite team if they consistently feel misunderstood. Moreover, factors including sponsor-team misfit, partnership inconsistency and a sponsor's image, all were found to contribute to fan resistance. Altogether, this research sheds light into the fan-level perceptions of resistance to sponsorship decisions and provides managers with insights regarding decisions about future sponsorship commitments with other corporations.

Mathematics and Statistics

A Sensitivity Analysis on a Model of Dengue Fever Focusing on How Time Spent in Neighboring Areas Affects the Basic Reproduction Number

Sabrina N. Campelo (Dr. Karen Yokley) Department of Mathematics and Statistics

Dengue fever is transmitted by day-biting mosquitoes in tropical climates and is a major public threat for countries in these areas. The disease is difficult to prevent and the progression of the disease into more severe forms is only partially understood. Ordinary differential equation models can be used to describe how infectious diseases move throughout populations, and predictions from these models may help in the development of effective treatment strategies. In order to investigate the spread of dengue fever, a previous student developed an ordinary differential equation model that describes the spread of dengue fever through neighboring communities. The basic reproduction number can be calculated from these types of models and can be thought of as the number of secondary infections produced by a single infected individual in the population. In this study, the basic reproductive number was determined for the previous model and calculated using the software Mathematica for various scenarios of visitation between the neighboring communities. When populations from smaller communities were simulated to spend more time in communities with larger populations, the reproduction number appeared to increase.

Modeling Salaries of Major League Baseball Players

Alonzo E. Cee (Dr. Ryne VanKrevelen) Department of Mathematics and Statistics

The sport of baseball has been around for a long time. However, an issue that has remained consistent is what has been deemed the appropriate amount to pay players. Past research has looked at wins above replacement, a metric used to summarize a player's complete contribution to the team in one number or statistic. Regression models, which use different combinations of career statistics, have been used to predict salary and even look at overvalued and undervalued players. To expand upon previous research, we have developed models to predict player salary through three main salary systems (pre-arbitration, arbitration, and post-arbitration) by looking at offensive statistics. Using regression models to analyze the Lahman Database for the three salary systems I find that a player's salary is much more reliant on on-field performance and statistics as years of experience increases.

Galois Groups of Doubly Even Octic Polynomials

Sam Cryan, Anna Altmann, and Maddie Touchette (Dr. Chad Awtrey) Williams High School

Solving polynomial equations is a fundamental task in the field of mathematics. While methods exist to approximate solutions of such equations, there are benefits in being able to express solutions exactly, without resorting to approximations. In the mid 1800s, mathematicians proved that the solutions to some polynomial equations can be expressed exactly and some cannot. Therefore, an important question to answer is: When can a polynomial equation's solutions be expressed exactly? To answer this question, mathematicians seek to compute the polynomial's Galois group, a collection of symmetries that encode important arithmetic information concerning the polynomial. In particular, the polynomial equation's solutions can be expressed exactly if and only if its Galois group has a certain property. Building on previous work from the 1980s, the speakers (who are students at Williams High School) have developed new theory and new algorithmic methods to compute Galois groups of doubly

even octic polynomials; that is, polynomials of the form x^8+ax^4+b where a and b are integers. For example, if b is not a perfect square and $b(a^2-4b)$ is a perfect square, they have proved that the Galois group of every doubly even octic polynomial is the same.

The Tale of Two Rating Systems

Timothy J. Gaetani (Dr. Todd Lee) Department of Mathematics and Statistics

When ranking sports teams, there are many philosophically different approaches. I looked at two such systems, those of Roland Minton and Charles Redmond, that are in fact equivalent. Minton's approach involves creating ratings numbers for teams to compute expected win-loss differences that equate with actual win-loss differences. Redmond sets up a rating system based on counting chains of indirect wins and losses for each team. Despite the differences in approach and look, the two systems are mathematically equivalent, and in his paper, Redmond noted this was the case. Here we show the proof via looking at the convergence of the power series of a matrix.

Measuring Ranking Distances

Juliet D. Goodman (Dr. Todd Lee) Department of Mathematics and Statistics

This study used two established pairwise-comparison ranking methods which are applicable for many situations, including ranking sports teams. The maximum likelihood estimator technique approach treats ratings like odds, chosen to maximize the probability of the whole season occurring again. The Google page ranking technique is a parameterized Markov process ranking. It creates a parameterized family of rankings that include two well-known rankings at the parameter's endpoint values. This paper uses regular season data from the 2013-2017 men's NCAA Division I basketball seasons to determine which parameter value in the Google page technique leads to the closest ranking to the maximum likelihood estimator's.

The Mathematical Modeling of Dengue Fever and its Economic Impact to a Socialist Country, with a Specific Focus on Sri Lanka

Alexandra N. Grasz (Dr. Karen Yokley) Department of Mathematics and Statistics

Dengue fever, currently the most prevalent mosquito borne disease, primarily affects countries with warm and tropical climates. Dengue is transmitted from an infected Aedes mosquito biting a human and has four serotypes. No cure for dengue fever exists, but prevention methods are sought to control the disease. Mathematical models can assist in understanding the spread of diseases so that the most effective intervention methods can be used. In this project, a differential equation model describing susceptible and infected populations was analyzed and modified to investigate the economic effects of the spread of dengue fever, such as the cost of governmental interventions or loss within a workforce. This project includes construction, analysis, and modification of a model and predictions created using Mathematica. The investigation of various factors revealed places to fund intervention methods to help more efficiently control infection numbers. This study showed that increasing the mortality rate of mosquitos or the public's

willingness to combat Dengue both had significant impact on decreasing the overall cost of Dengue fever.

Classifying Eisenstein Polynomials of Degree $2p$

Nicholas A. Hadgis (Dr. Chad Awtrey) Department of Mathematics and Statistics

First introduced by mathematician K. Hensel at the end of the 19th century, the p -adic numbers are now ubiquitous in many areas of current research in number theory. One area of research that has received much attention lately deals with classifying polynomial equations whose coefficients are p -adic numbers. A result of M. Krasner in the 1960s states the following: for a fixed prime number p and positive integer n , there exist only finitely many "distinct" degree n polynomials with p -adic coefficients. Krasner's result elicits several logical questions. How many distinct polynomials are there for a given degree and prime number? Can we write down what these polynomials are? Can we compute important characteristics of each polynomial, such as the polynomial's Galois group? Previous research by S. Amano in the early 1970s answered these questions for Eisenstein polynomials when the degree of the polynomial is equal to the prime p . Our work extends Amano's results by completely classifying Eisenstein polynomials of degree $2p$. Using a p -adic root-finding algorithm due to P. Panayi, we construct all distinct Eisenstein polynomials of degree $2p$, we compute the mass of each polynomial (which is a characteristic for computing the polynomial's Galois group), and in the case that the mass is equal to one, we identify the Galois group as either being cyclic of order $2p$ or dihedral of order $2p$.

Documenting Students' Perceptions of Incorporating History into Calculus Courses

Maddie J. Jaudon (Dr. Aaron Trocki) Department of Mathematics and Statistics

Numerous educational theorists have recognized that learning the history of a certain discipline is essential to learning the content of that discipline. Regarding mathematics, Berlinghoff and Gouvea (2002) explained, "Learning about math is like getting to know another person. The more you know of someone's past, the better able you are to understand and interact with him or her now and in the future" (p. 1). Study participants were students in one course section of Calculus I and one course section of Calculus II. This research documented students' perceptions of incorporating the history of mathematics into teaching and learning through research, writing, and course lectures. Perceptions were recorded using a questionnaire and students' research papers were collected. The questionnaire provided evidence of how students believed their calculus learning was affected. Descriptive statistics were calculated for all numeric data and thematic analysis was documented for all open response data. Analysis of open responses was guided by Creswells' (2012) recommendations for documenting emergent themes in qualitative data. Results were compared across course sections. The majority of students believed incorporating history benefited their learning (66%). Reflections that were collected from students revealed how the use of history affected their learning in calculus. An emergent theme in these reflections was a deeper understanding of course content. Similarities and differences between student response data and writing in Calculus I and Calculus II were documented and will be shared. The study provides some evidence on the benefits of

incorporating history into calculus teaching and learning. Future research may explore other ways of incorporating history such as the use of digital media or primary historical sources.

Utilizing Twitter to Predict Stock Market Trends

Joseph B. Keating (Dr. Crista Arangala) Department of Mathematics and Statistics

Creating a mathematical model to predict price-trends within the stock market poses significant challenges due to the dynamic relationship between stocks and the global economy. My research is focused on examining the non-linear relationship between stock market price-trends and twitter sentiment, with the end goal of establishing an effective stock-price prediction model. If a strong enough correlation between sentiment and stock price is found, then the variables will be incorporated into a stock-price prediction model. Sentiment will be measured using a personalized java program and the IBM Watson: Alchemy Language program. In order to test the predictive ability of sentiment on stock prices, we will utilize various time-series prediction models. Early results have indicated a strong, positive relationship between sentiment scores and stock prices. I anticipate that a correlation between Twitter sentiment and stock prices will be demonstrated and thus demonstrate the usefulness of Twitter sentiment to predict stock prices.

Cyclic Polynomials of Degree p^2 and p^3

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

The groundbreaking work of mathematician Evariste Galois in the 1830s shows that roots of polynomials have symmetries. Since these symmetries encode important arithmetic information about the polynomial, one area of current research seeks to develop methods for determining the symmetries of a given polynomial. This project looks at the related question: for a given collection of symmetries, which polynomials exhibit these symmetries? We focus on the case of degree p^2 and p^3 polynomials with p -adic numbers as coefficients where p is a prime number. For all polynomials whose symmetries are cyclic (they form the rotations of a regular polygon), we give a complete classification of all distinct such polynomials, extending previous work by Shigeru Amano in 1971 who produced a similar classification for polynomials of degree p .

Continued Investigations on Ventilation Equation Structure in Physiologically Based Pharmacokinetic (PBPK) Modeling of Inhaled Toxicants

Matthew C. Laing (Dr. Karen Yokley) Department of Mathematics and Statistics

PBPK modeling is a technique used in the field of pharmacology and toxicology. These mathematical models simulate the flow of a given chemical through different “compartments” of interest in the body. This research project studies a PBPK model of Xylene, a common chemical product of paint and paint thinners, and focuses on the blood, lungs, rapid and slowly-perfused tissues, and fat of the body. This project expands on previous work, testing the differing flow of xylene at different bodyweights. The PBPK model was simulated using Mathematica, taking the structure of the model and basic constants from previously established works. The model was

then adjusted for varying bodyweights, from a range from 50 kg (110 lbs.) to 70 kg (154 lbs.), which were established from taking the average height of the American population and extrapolating weights from a healthy range of BMI values. Despite the range of weights, there were no significant differences in any of the compartmental predictions due to bodyweight except for fat, which held increasing rates of initial retention for higher bodyweights and increasing retention times for lower bodyweights. Future work will focus on revisiting these calculations with body fat distributions that represent a more diverse population.

Comparison and Analysis of a Ranking Method Using Embedded Tournaments in a Regular Season

Alexis M. Padula (Dr. Todd Lee) Department of Mathematics and Statistics

Ranking systems can be used to rank a wide range of things, from companies to sports teams. When ranking different subjects, the factors used to rank them may vary. For example, when ranking sports teams, there are two common variables used: strength in schedule and number of games won. Although many methods involve both variables, the amount they weigh each factor may vary. The higher the emphasis on one factor, the less emphasis there will be on the other. This research consists of ranking teams based on the number of hypothetical tournaments they have won. These tournaments are constructed using games actually played in NCAA Division I College Basketball regular season. Our approach is to create smaller tournaments and then combining those to create larger tournaments, taking into account all games played in a particular season. In order to complete this, we will be viewing one regular season game as a two-team single elimination tournament and combine games to create a four-team tournament. The number of tournaments that each team won at this level will be computed. The teams can then be ranked based off of the number of tournaments won. This combining of two similar sized tournaments can continue to create larger tournaments. As the tournaments get larger, the ranking will become more reliable. In order to find if our rankings are accurate, we will compare our ranked teams to other rankings that rely on strength in schedule and wins to see which ranking ours is most similar to, including Minton, Redmond, and Ford ranking methods. We believe this ranking system will fall near one of these rankings.

Predicting End of Year MLB Team Records with Confidence Intervals

Benjamin P. Rogers (Dr. Ryne VanKrevelen) Department of Mathematics and Statistics

Baseball has longer seasons than any other North American professional sports leagues, leaving fans to decide how invested they should be throughout the course of the season. The use of sabermetrics, the statistical analysis of baseball data, is often used to measure a team or player's current or future performance. Using data from Retrosheet.org, confidence intervals were constructed based on five different points in the season for the years 1962 to 2016. These confidence intervals were used to showcase a range of possible winning percentages with which a team could finish. A total of six confidence interval methods were evaluated by calculating intervals for each of the 1352 observations and then determining whether the team's actual winning percentage fell within the interval. Five of the confidence interval methods were variations of a standard Z interval, each including differing amounts of information such as team

record, runs scored, and games remaining, which was used to determine each interval's center and width. A final method was constructed from a linear regression model that also incorporated a team's previous season's winning percentage. The effectiveness of these methods was analyzed by determining how often each team finished as predicted and by comparing the average interval width of each method. The width of the intervals from the linear regression model were narrower than those of the other five methods, meaning a fan would have a better idea of how a team would finish the season. It was discovered that a team's record during the previous year becomes less meaningful for prediction as a season progresses. The linear regression model and the two methods incorporating games remaining successfully contained the true winning percentage as often as the specified confidence level. Due to ease of use and accuracy of results, each method has benefits and disadvantages. However, both fans and those involved in the game can benefit from this research.

Symmetries of Degree 8 Polynomials

Kiley E. Shannon (Dr. Chad Awtrey) Department of Mathematics and Statistics

The notion of solvability by radicals is a fundamental area of mathematics that has been around for hundreds of years. While mathematicians have been able to solve for roots of quadratic (degree 2), cubic (degree 3), and quartic (degree 4) polynomials, it was later proven that not all quintic (degree 5) polynomials can be solved. A polynomial whose roots can be expressed using only the coefficients, basic arithmetic operations, and radicals is considered solvable by radicals. The work of mathematicians like Abel and Galois on the solvability of lesser degree polynomials led other mathematicians to turn to polynomials of higher degrees. Following previous work on degrees 5, 6, and 7 polynomials, this project takes a natural next step to look at degree 8 polynomials. We can determine if a polynomial is solvable by determining its groups of symmetries. Using computer programs, we developed an algorithm that computes a variety of characteristics to determine what group of symmetries a degree 8 polynomial exhibits. When input with a degree 8 polynomial, the algorithm returns a corresponding Galois group. These groups, named after mathematician Evariste Galois, define a known group of symmetries. Given that the 50 possible Galois groups of a degree 8 polynomial are distinctly defined by an extensive list of characteristics, this project also explores certain groups that can be determined uniquely by only a couple characteristics. Results now define a certain family of polynomials that will always have the symmetries of the group labeled 8T16, a group present in other areas of science. Further research could look at higher degree polynomials or attempt to solve the polynomials that are determined solvable.

Analysis of NC Public School Education Funding

Christian L. Wagner (Dr. Kirsten Doehler) Department of Mathematics and Statistics

North Carolina's public school funding system is currently under review due to its tendency to favor wealthier counties in the distribution of annual school funds. In March of 2017, a study by the Public School Forum found that "gaps in local funding per student persist despite data that show North Carolina's ten poorest counties taxed themselves at almost double the rate of the state's ten most affluent counties" (Ball, 2017). This research project aims to investigate why

these poorer counties continue to fall further behind in education resources under the current funding system. Data was collected from the Distressed Communities Index and Public Schools First on variables for all one hundred NC counties that describe levels of economic distress such as property tax rate, school performance, percent of adults with no high school diploma, and poverty rate. The current system provides supplemental funding to low wealth areas based on a county's ability to generate local education funds. Poor counties with high property tax rates are receiving substantially less funding under these criteria. Our analysis revealed that high tax counties had significantly lower school performance scores than counties with average to low tax rates. In order to present this data to non-statisticians, an online applet was developed, allowing individuals to interactively explore graphs that display the trends found in this study. We aspire to make this applet available to the public (via web) in order to further educate students, parents, and education organizations on this issue. If North Carolina policy makers do not amend the current system, the gap in education funding between wealthy and poor counties will continue to grow, jeopardizing the future for thousands of young children across the state.

Counting p -power Extensions of the p -adic Numbers

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Let p be an odd prime number. A significant result from M. Krasner in the 1960s shows that for a fixed positive integer n , there are only finitely many distinct polynomials of degree n whose coefficients are p -adic numbers. A question one may ask is: how many such polynomials are there? Krasner gave a formula that counts the total “mass” of all distinct polynomials with a given ramification index. Here the mass of a polynomial is equal to its degree divided by the number of roots in the polynomial's extension field. The ramification index of a polynomial, which is always a divisor of the degree, is a measure of how divisible by p its roots are. In the 1970s, Amano answered this question when $n=p$, showing there are precisely p^2+1 distinct polynomials. In this talk, we will discuss recent work by the presenters that answers this question when $n=p^2$ and $n=p^3$.

Music

Subconscious Memory and Replication of Popular Music through Musical Key and Tempo Accuracy

Brian A. Duffy (Professor Clay Stevenson) Department of Music

According to a 1994 study by Daniel Levitin, repeatedly listening to popular music, by musicians and non-musicians alike, creates mental representations of musical pitch that can be replicated with surprising accuracy. Further research regarding this “Levitin Effect” is scarce, with the original study having been only repeated once (Fischinger, et al. 2012). While these studies' results regarding pitch seem conclusive, research on replication of tempo is minimal, and there is no research on comparisons between songs in more and less common musical keys. This study will also clarify whether musical training influences the ability of subjects to recreate a melody at will. It was hypothesized that a similar accuracy of tempo replication to the Levitin study will

be found, and that more extensive musical training will correlate to a more accurate internal metronome. In addition, the pitch of songs in more common musical keys will be more accurately reproduced than that of songs in less common keys, regardless of musical training. Forty college students with a variety of musical backgrounds were asked to recall a short portion of the melody of two songs; one was chosen by the participant and the other from a pre-defined list. One list of songs in common keys was shown to half of the participants, with another list of songs in uncommon keys shown to the other half. The tempo of each participant's first recording was compared to the tempo of the original recording of the chosen song. The pitches of the first three notes of each participant's second recording were also compared to those of the original recordings, and a standard deviation was calculated. Results forthcoming. Findings will provide insight into the melody learning process for students in aural skills and music theory classes.

How Parliament-Funkadelic's Lyricism and Musicality Influenced Hip Hop

Jason A. Dunn (Professor Joseph Noelliste) Department of Music

When people today think of funk music they picture a band on stage, decked out in cliché '70s outfits, playing slap basslines to a dancing audience. While letting loose is a main purpose of funk music, funk has many other purposes beneath its surface that resonate deeply with the African-American community and have influenced the course of commercial music in a multitude of ways. By analyzing the text-music relationship in the music of Parliament-Funkadelic, a funk collective most active in the 1970s, and that of two hip-hop sub-genres, I will demonstrate some of the musical and lyrical borrowing from funk that has changed the course of commercial and underground hip-hop. I found certain melodic and rhythmic characteristics in Parliament-Funkadelic's music reflect their lyrics on outer space and inner nature, and these characteristics resurfaced in hip-hop of the 1990s, often reflecting similar themes but sometimes repurposed to suit a different attitude. By putting a brand-new twist on an already established genre of music, Parliament-Funkadelic is one funk band that has been able to resonate with people across genres and generations.

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. The information was 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.

Performing Arts

Imagining Iceberg: Translating Hemingway's Iceberg Theory into a Choreographic Technique

Abigail Corrigan (Professor Renay Aumiller) Department of Performing Arts

Imagining Iceberg translates Hemingway's Iceberg Theory of writing into a choreographic technique. Movement structured in this way evokes an emotional response from the audience intense enough to rival real experience. Created by Ernest Hemingway, The Iceberg Theory is a writing style in which only surface details are described while thematic elements are left open to interpretation (Darzikola, 2013). Through Iceberg Theory, Hemingway was able to "transport" his readers, which allows individuals to experience empathy (Bal, 2013). It was found that transportation is created through the simultaneous activation of the virtual (imagined) and actual (experienced) realms of art. Translating this communication method into choreography offers an approach that emphasizes dancer and audience engagement. Using practice-based research methods, this choreographic process was investigated during a five-month rehearsal process with eight dancers, culminating in a full-length work. Imagined movement pathways were crafted through an extensive exploration of energy, while simultaneously, the dancers' senses were stimulated through images of familiar human behaviors. The combination of the creative development behind the movement and the sensory experience of the dancers, which was exemplified in the full-length dance work created from the rehearsal process, paralleled Hemingway's writing style in the medium of choreography.

Intersecting Dance, Design, and Multimedia in Live Performance

Alexandra K. Fung (Professor Jennifer Guy Metcalf) Department of Performing Arts

Live multimedia dance performances lack a common integrational approach, especially in comparison to other arts forms. Despite the cultural relevance of this developing genre, the scope of academic research on dance and multimedia is significantly limited. This research sought to answer the question: How do choreographers use multimedia and spatial design to create innovative work that challenges the boundaries of traditional live performance? To answer this question, excerpts of five notable dance and multimedia works were analyzed, using Ohio State University's "Synchronous Objects" as inspiration. These five works are *Biped* (1999) by Merce Cunningham, *Infra* (2008) by Wayne McGregor, *Fondly Do We Hope...Fervently Do We Pray* (2009) by Bill T. Jones, *Dance* by Lucinda Childs (2011), and *Jusqu'au silence* (2011) by Sophie Corriveau. The chosen works were analyzed for multimedia elements, movement themes, spatial design in the choreography, and synchronization between the multimedia elements and the performers. Similar to "Synchronous Objects," the data from these analyses was then charted to match the timeline of each work, creating choreographic storyboards. Through this process, these analyses revealed that multimedia in these works tended to serve three purposes: To establish an aesthetic, to highlight the choreography, or to further a narrative or thematic

concept. These works showed no universal approach for incorporating multimedia in choreography. How often and where multimedia appears in space significantly differed between works. Based on these findings, five choreographic tasks were completed, taking inspiration from the analyzed structures to explore different methods of multimedia integration. These tasks informed the creation of five movement sections that were then synthesized to form a full piece. This piece was presented in early April and featured a multimedia collaboration with an animator, using design ideas gleaned from the analyses.

Integration of a Complex Balance Task into a Concussion Management Protocol Specific to Dancers

Corinne M. Kenny (Professor Lauren Kearns, Dr. Caroline Ketcham, and Dr. Eric Hall)
Department of Performing Arts, Department of Exercise Science

Mechanisms for concussions in dance include drops from lifting, falls from stage sets, and contact with the floor or fellow dancers that happen during class, rehearsal, or performances. Despite the recent awareness of sports-related concussions, there are gaps in knowledge regarding dance-specific concussions and what a “return to dance” protocol should look like for dancers. Although dance is not a high-impact sport like football or rugby, concussions still occur and can be calamitous for a collegiate and professional dancer’s career. Balance tests, standard in concussion management protocols, are useful tools for evaluating the motor domain of balance functioning and are considered reliable and valid assessments of athletes suffering from concussions. **PURPOSE:** Develop and investigate a complex balance task series and confidence measurement to integrate into a concussion management protocol specific to dancers. **METHODS:** 31 participants, pre-professional dancers (n=12) and recreational dancers (n=19), completed a multipart evaluation to assess static and dynamic balance. They were tested using the Balance Error Scoring System (BESS) test which assessed static balance through performing 3 stances on 2 surfaces (ground and Airex Balance Pad). The modified Dance BESS (DBESS) test assessed static and dynamic balance of the participants through performing 10 dance movements on 3 surfaces (ground, Airex Balance Pad and foam balance beam). Participants were monitored and scored for errors on each balance test. **RESULTS:** Pre-professional dancers and recreational dancers were not significantly different for static balance on the BESS and DBESS ($p>0.05$). There was significant difference between the pre-professional dancers and recreational dancers ($p<0.05$) for the dynamic balance conditions in the Dance BESS. **CONCLUSIONS:** More skilled dancers show greater differences with dynamic balance conditions. Thus, creation of more dynamic balance tasks would be useful for baseline and post concussion testing and aid in the overall tracking during the concussion rehabilitation period for dancers.

Trends in 21st Century Dance Criticism

Minnie B. Lane (Professor Renay Aumiller) Department of Performing Arts

Dance criticism strives to describe, interpret, contextualize, and evaluate dance performances in efforts to make the ephemeral art form accessible to the public and improve the field as a whole. In the 2000s, when newspapers began to trim their print issues and transition into an online

medium, arts journalism often was cut first. Dance criticism took an even harder hit, leaving only two full time dance critics in the United States, Alastair Macaulay of the *New York Times* and Sarah Kaufman of the *Washington Post*. Today, the field depends heavily on freelancers, click-bait titles, and the critic's twitter followers to survive. Contemporary dance criticism commonly presents heteronormative, patriarchal, and western aesthetics, and, at its worst, extends offensive rhetoric as the major critical voice of the field. This research includes annotations and analysis of 100 pieces of 21st century dance criticism, focusing on specific patterns in the writing. This presentation will focus on two recurring patterns. First, there is a pattern among critics of yearning for political relevancy in choreography, likely due to our highly charged political climate. However, critics often cast that responsibility on minority choreographers, therefore placing limits on what a minority choreographer can produce art about. Second, there is a pattern of nostalgia in dance criticism, in which critics favor old choreography and companies over their newer counterpart. Both of these trends paint a bleak picture of the current state of dance criticism, but there are solutions, including hiring more critics of color and creating a stronger system of accountability for dance critics. There is little published research on 21st century dance criticism, and my aim is for my research to act an impetus for further study.

National Stage Manager Survey, 6th edition

Tara M. Patterson (Professor David McGraw) Department of Performing Arts

The profession of stage management is notoriously decentralized. This survey aims to discover what trends are the most popular and are hence implemented more regularly. The goal of this project is to allow practicing stage managers to examine how other stage managers tend to work in their profession and discover overarching demographical trends that have impacted the industry. Learning which trends stage managers tend to agree on compared to which trends they tend to differentiate on can allow stage managers to think more deeply about their own work and consider how it could be improved. The stage manager survey is the largest study of stage managers in the world. The survey collected data from over 1775 participants from 48 states and several US districts. Based on reported contracts, this is between 15% – 30% of all American stage managers. The survey intentionally focused on American stage managers as to avoid confusion on any cross-cultural technical terminology. This edition of the survey aimed to create a more inclusive platform for all survey participants, particularly by offering more ways of expressing gender. The survey does not offer any incentives for participation and relied solely on promotional tactics. By using Qualtrics, we were able to cross-analyze the data in order to observe complicated data that should be known to the industry. For example, the survey has unfortunately tracked the undeniable wage gap between male and female stage managers, an increase in workplace discrimination, general resistance to updated technology and lack of ethnically diverse representation within the field. However, on a brighter note, we also discovered that people are generally satisfied with their careers, work/life balance, and education.

Physical Therapy Education

Comparing Forward and Backward Walking in Older Adults

Sydney P. Nelson (Dr. Srikant Vallabhajosula) Department of Physical Therapy Education

Change in gait and a person's risk of falling previously have shown a positive relationship. Those with a fear of falling tend to walk slower, have shorter stride length, increased base width, trouble balancing, and increased duration in double-leg support. These factors along with increased gait variability, and past falls (Maki, 1997), are predictors for fear of falling (Brach et al., 2001). Backward and forward walking both test a person's balance, which is why these two conditions of walking were used (Makino, Takami & Oda, 2017). Along with testing balance, backward walking has also been shown to differentiate older adults who are at high fall risk. However, there is a gap in research when it comes to the differences in gait characteristics in older adults while walking forward and backward at different speeds (normal and self-selected fast). 30 older adults participated and were split evenly into two groups of 15; 15 were identified as healthy, while the other 15 were identified as being at risk for falling. Each participant walked five times per walking condition on a GAITRite walkway; the four walking conditions include normal speed in a forward direction, normal speed in a backward direction, fast speed in a forward direction, and fast speed in a backward direction. Preliminary results show that average gait speeds for healthy adult's normal forward gait is 130.8 cm/s, fast forward gait is 174.3 cm/s, while the average gait speeds for adults at risk for falling normal forward gait is 120.1 cm/s, and 162.5 cm/s for fast forward gait. This research will add to previous knowledge about the influence of walking speed and direction of gait variability in older adults. This is ongoing research and data is currently being processed. Specifically, stride length, base width, double-leg support, gait speed, and variability will be measured and help determine differences between the two populations and four walking conditions.

The Impact of Chronic Obstructive Pulmonary Disease on Bone Density, Postural Control, Falling, and Activities of Daily Life

Caroline A. Petitti (Dr. Srikant Vallabhajosula) Department of Physical Therapy Education

In addition to airflow limitation and respiratory distress, Chronic obstructive pulmonary disease (COPD) has many other manifestations including skeletal muscle dysfunction and impaired postural control. Recent evidence also suggests an increased risk of falls among individuals with COPD. Established risk factors for falls in individuals with COPD include lower limb muscle weakness, impaired physical functioning, and impaired balance. The risk factors and impairments associated with COPD patients are also common in the elderly population. Falls manifest as psychological consequences in both the elderly and people with COPD, which leads to an increased fear of falling and subsequent decreased quality of life. Despite the established association between chronic conditions and an increased risk for falling, studies analyzing the prevalence of falls and contributing factors among people with COPD are sparse. The purpose of the study is to explore the associations between bone mineral density, postural control, fear of falling, and impaired activities of daily living in individuals with COPD. Previous studies have also measured gait speed in this population using the six-minute walk test, which is an indicator of endurance. It is currently unknown if the gait speed measured using the six-minute walk test is different than the ten-minute walk test for gait speed in this population. The current study will address that. This is an on-going study. 50 participants with COPD aged between 40-65 years will be recruited to participate at a pulmonology clinic. Measurements will include a six-minute walk test, timed up and go test, modified clinical test for sensory integration and balance, and

gait assessment using APDM Opal sensors. Dual energy x-ray absorptiometry will be used for bone density measurement. Quality of life will be assessed using the St. George's Respiratory Questionnaire. Step activity for one week will be measured using the Step Activity Monitor. Correlation tests and regression analyses will be performed to assess these associations.

Physics

Magnetic Thin Film Deposition and Analysis Using Magneto-Optic Kerr Effect (MOKE)

Henry D. Davis (Dr. Kyle Altmann) Department of Physics

Magnetic properties of materials can be manipulated by changing the elemental composition of the material. By combining Iron and Nickel in different concentrations, we can produce a wide range of alloys all with different magnetic properties. These magnets with very specific properties are useful in precise electronics such as computers. We first put together a vacuum chamber capable of very low pressures down to 10^{-9} Torr suitable for evaporating metals. We built through numerous iterations a set of Nickel, Iron, and Copper evaporators which we placed inside the vacuum chamber and were used to deposit thin layers of these elements onto a sheet of silicon. To analyze the resulting alloys, we used what is called the Magneto-Optic Kerr Effect (MOKE), which is when a polarized laser is rotated slightly when reflected off a magnet. We magnetized the alloy samples using an electromagnet, and by varying the magnetic field we can create a plot of applied field versus magnetization. A hysteresis of the data shows how a magnet can have different properties for the applied field based on the magnet's magnetization history. We have not yet generated a proper hysteresis due to several possible issues, but by continuing to improve our methods we hope to successfully chart the correlation between alloy concentrations and their unique magnetic properties.

Deactivation of Nematode Eggs in Wastewater for Parasitic Disease Mitigation

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

Posited as a public health risk by the World Health Assembly in 2001, helminth worms are a virulent family of parasites prominent in the developing world with various species together having infected approximately one quarter of the world's population. Helminth eggs are incredibly resilient—possessing the ability to survive changing environmental factors and exposure to various chemical treatments—and while conventional sanitation methods are able to inactivate the eggs, they are largely inefficient in doing so. Finding an alternative approach to sanitation that is cost-effective and sustainable 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 helminth surrogate, and discusses progress toward implementation in off-grid toilets. This electrophysical technique utilizes electric pulses to increase the permeability of cell membranes in its conventional application but herein is used to open pores in nonparasitic 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 was performed using a 1-Hz pulse train with a 0.01% duty cycle. The extent of

pore formation was determined using a fluorescent label, propidium iodide, that targets *C. elegans* embryonic DNA. Both *in-situ* and *ex-situ* fluorescent microscopic imaging during *C. elegans* treatment was explored using customized test cells. The results of this research demonstrate that electroporation increases eggshell permeability through potential channel formation within the shell. Based on our observations thus far, we discuss current treatment conditions and associated energy consumption requirements for destroying *C. elegans* eggs, and by extension, helminth parasites, in wastewater.

Investigating the Temperature Problem in High Temperature Emission Line Galaxies

Samuel D. Jenkins (Dr. Christopher Richardson) Department of Physics

A supermassive black hole lies at the center of every massive galaxy in our universe. Our research aims to identify the physical conditions necessary for gas clouds to show signs of anomalously high temperatures in galaxies with active supermassive black holes. We investigate these physical properties of gas clouds in galaxies by analyzing the emission lines we observe from them. Ratios of these emission lines can tell us physical properties of clouds in the galaxy, such as temperature, density, or elemental abundance. We acquired a data set of several hundred thousand galaxies from the Sloan Digital Sky Survey and filtered it down to 469 galaxies with highly accurate emission line readings. We then sorted the galaxies into categories, including those with active supermassive black holes, using an empirical scheme based on emission line ratios. Using a supercomputer and the astrophysical code Cloudy, we ran simulations of galaxies with varying physical parameters and compared those simulations to the high temperature galaxies in our data set. Varying the parameters of our simulations shows us the effect that different properties have on temperature, helping us understand what is happening in our high temperature galaxies. So far, we have found that varying only ionization and density cannot reproduce the emission ratios shown in the high temperature galaxies of our data set, which is a significant result. Our highest temperature simulations have come from high dust content and low metallicity, which matched only about 10% of our high temperature galaxies. Though the majority of our high temperature galaxies still fall outside these simulations, we have seen that high dust content and low metallicity can lead to high gas cloud temperature. In the near future, we will run other sets of simulations varying ionization and dust content to assess the effect that this combination of parameters will have on the temperature of gas clouds.

Design and Fabrication of Chained-Particle Magnetic Composites for Biomedical Applications

Kayla S. Pieri (Dr. Benjamin Evans) Department of Physics

Magnetic nanoparticles have shown promise in a variety of biological applications. For example, magnetic nanoparticles can be heated using an oscillating magnetic field. When such particles are delivered to tissues and heated remotely, they can overheat problematic cells, such as cancer or bacteria, to induce cell death. In this study, a protocol was developed for chaining nanoparticle composites under an applied magnetic field. The novel material, which consists of iron oxide nanoparticles encapsulated in a silicone polymer, arranges itself into chains in the presence of a magnetic field, enhancing the magnetic properties of the material. After chain formation, the

material is crosslinked to ensure chain stability when removed from the magnetic field. Preliminary results show that the formation of nanoparticle chains creates a measurable magnetic directionality within the material, which results in enhanced magnetic heating ability and allows us to exert mechanical torques on the material with a magnetic field. These properties will be useful in magnetic hyperthermia therapeutics for treating cancer or bacterial infections, and for enhancing magnetic force experiments in cell or tissue mechanics.

Political Science and Policy Studies

Mr. Modi's Ocean View: Indian Foreign Policy in the Indian Ocean Region

James H. Burnham (Dr. Jason Kirk) Department of Political Science and Policy Studies

The Indian Ocean, which consists of ocean and coastal waters stretching from the Horn of Africa to the Straits of Malacca, is a critically important region to India. Since 2010, India's GDP has grown between five and a half and ten and half percent, much of it due to maritime trade and in 2013 imported thirty-two percent of their energy resources from abroad. Consequentially, control of the IOR and its security maintains high value in Indian foreign policy considerations. Elected in 2014, Indian Prime Minister Narendra Modi, the strongman leader of the Hindu-nationalist BJP party potentially possesses a unique opportunity to shape modern Indian foreign policy. Along with his election, the BJP gained a parliamentary majority, which has not happened in India for two decades, and never for a party other than the Congress party. While not the first prime minister to have a desire to shift Indian foreign policy, Modi's unique position, along with the self-styled, hyper-masculine persona he has cultivated for himself provides him the opportunity to shape it in profound ways. Since he first stepped onto India's political stage, Modi has relied on the strength of his personality as well as his image to facilitate his political decisions. However, within India and the broader regional context, Modi will be challenged by various institutions, actors, and material constraints which will limit his options for enacting his vision. I take into account data which articulates Modi's plan, as well as scholarly literature to evaluate the aforementioned variables. Central to this research is the interaction between ideas and political and material realities within a constructivist framework. I find that while Modi's public image raises expectations of drastic foreign policy change, the resultant outputs are moderate and less sweeping than anticipated.

Authoritarianism and Heidegger's Black Notebooks: An Investigation of the Black Notebooks

David J.Q. Nunamaker (Dr. Sean Giovanello) Department of Political Science and Policy Studies

Martin Heidegger was a deeply influential 20th century thinker whose 1927 work *Being and Time* radically reframed Western philosophy, however his legacy and the study of his works have been tainted by his membership in the Nazi Party in Germany during the 1930s. The "Heidegger Question," which this research addresses, is whether or not Heidegger was guided by his philosophy into acting politically as Rector of the University of Freiburg from 1933-34, during which he gave a number of speeches in favor of Nazism and Hitler's regime (Ott, 1993).

Heidegger's work has been the focus of a number of political theorists, and he was of direct influence to scholars such as Hannah Arendt and Leo Strauss (Wolin, 1990). The intersection between Heidegger's philosophy and politics has been subject to immense scrutiny over the course of the 20th century by political theorists. If Heidegger was guided directly by his own philosophy into acting politically on behalf of the Nazi Party, his influential work may be implicated as being essentially authoritarian. To further investigate the nature and implications of Heidegger's actions, this research utilizes a qualitative analysis of the first volume of the recently published "Black Notebooks," a series of notes which Heidegger kept from 1931-1945. The reading was focused on determining the nature of Heidegger's usage of terms such as *Volk*, *spirit*, *historicity*, and *Dasein* to investigate whether Heidegger began to use these terms in reference to the German state and people during this time. This research finds that Heidegger did use his philosophical language in a collectivist manner in the notebooks, extrapolating and applying his concepts to the political situation at hand in order to justify his actions as rector. Heidegger's belief in a metaphysical destiny for the German people guided him into assuming the position of rector, through which he believed that he could assist Germany in fulfilling their destiny. Several volumes of the notebooks await publication, and these works merit further investigation. No definitive conclusions about Heidegger's motivations or actions can be made without a comprehensive analysis of all available resources, including those yet to be published.

Executive Orders in the First 100 Days: Overturning an Administration or Forging a Legacy?

Spencer T. Wagner (Dr. Carrie Eaves) Department of Political Science and Policy Studies

Often, the first 100 days of a presidency are dominated by media coverage focused on the president's legislative agenda. Yet, in the mix and rush of the first 100 days, a powerful tool is available for presidents to act without Congress. The executive order, the ubiquitous unilateral power, provides presidents a direct opportunity to influence policy, either by creating their own or altering the policies of their predecessors. Some of President Trump's first actions in office have brought to the nation's attention how powerful the executive order can occasionally be. This research examines presidents' usage of executive orders in the first 100 days to determine if presidents are more likely to create their own policies or to overturn and amend the policies of previous office holders. Focusing on the unilateral powers theory (Howell 2003) of the presidency, a relatively new but growing body of research, this research categorizes the executive orders of seven recent presidents to determine if there are consistent patterns, and if these patterns persist either across time, party, or other factors. Orders are classified for creating "original" policies, amending previous orders, or revoking previous orders. Additionally, the orders are classified for being major policy, routine, or symbolic, as well as their impact on various areas of the executive branch. Using data I collected on Presidents Carter through Trump and their issuance of executive orders in the first 100 days of their presidencies, I built several logistic regression models to predict the types of actions as well as the types of orders and their relations to the presidents. I find that President Trump was much more likely to issue executive orders than predecessors and discuss substantial variation among presidents in the types of orders issued. I find that executive orders issued in the first 100 days are more likely to be substantive in nature if they are broad in scope. This research finds it difficult to predict the actions of the presidents and discusses the implications for the theories of the presidency.

School Choice: Do We Have the Evidence to Justify Federal Policy Reform?

Benjamin I. Maloney (Dr. Betty Morgan) Department of Political Science and Policy Studies

The current U.S. Secretary of Education, Betsy DeVos, has repeatedly made the claims that private, private-religious, and private-charter schools *outperform* public district schools, and that existing voucher programs have resulted in significant academic improvement in the areas where they have been implemented. DeVos uses these premises to support her objective to increase School Choice, or the appropriation of significant educational funding towards voucher programs for private institutions. This research has two parts. **Part one** examines available data and literature pertaining to the supposed success of private institutions as they compare to public/district schools in terms of academic achievement. Data used this section includes NELS, SAT, NCES, and NAEP reported scores, as well as data from previously conducted studies. **Part two** explores current data and research to determine whether or not existing voucher programs in the U.S. K-12 education system have been shown to improve student achievement. Measures of academic achievement utilized in this research are available test scores in the areas of English/Language Arts (ELA) or reading, and mathematics. Data used in this section includes ECS, DPI, AERA reported scores as well as data released from Milwaukee Public Schools and the Department of Education. **Part one** of this study suggests a lack of evidence to support the claim that private schools outperform public schools when ELA and mathematics scores are adjusted for population characteristics tied to academic achievement. **Part two** finds that there does not exist significant evidence to suggest improvement in student academic achievement as a result of voucher program implementation. We conclude that there is insufficient evidence to claim *academic achievement* as evidence for School Choice advocacy.

The Influence of Participatory Budgeting Initiatives on Civic Engagement and Political Efficacy

M. Bear Tosé (Dr. Jessica Carew) Department of Political Science and Policy Studies

The purpose of this study is to analyze the degree to which elite perspectives regarding citizen engagement influence the structures and processes of a citizen-based participatory budgeting initiative, thereby influencing levels of civic engagement and political efficacy among typically underrepresented communities. Participatory budgeting (PB) is a democratic process in which community members directly decide how to spend part of a public budget, giving ordinary citizens real decision-making power in allocating resources to their own districts and neighborhood communities. By examining elite perspectives of the PB process, we gain a better understanding of how the beliefs held by the stakeholders influence the structure of the PB process and the effectiveness of the initiative itself. This research examines semi-structured interviews with Steering Committee members of the Greensboro PB initiative to evaluate the degree to which they view the goals of civic and social justice as essential to PB. Given Greensboro's history of racial tension and the more general corruption associated with recent North Carolina politics, it is hypothesized that elites involved in this process have unfavorable opinions when it comes to entrusting decision-making power to average citizens and may attempt to limit their degree of involvement. In preliminary findings, we see that while engagement and participation were important to committee deliberations, the ideas of civic and

social justice were largely underlying goals, which were ultimately limited by the scope of the process. Moreover, it is suggested that those who are actively participating represent only a portion of the city's most affluent residents, which can be attributed to the lack of intentional outreach strategies and overall accessibility to the process. Despite this, the main success of the initiative is its ability to engage in discussion across lines of difference and build social capital among citizen groups and between these groups and government officials.

Psychology

tDCS and the ERP Waveform: Behavioral and Neurological Modulation

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ERP waveforms are neurological changes that occur in response to external stimuli, measured via EEG data. Components of an ERP waveform are indicative of stimuli eliciting various changes that are sensitive to both presentation time (latency) and magnitude of response (amplitude). The capacity of transcranial direct current stimulation (tDCS) to change ERP components has become a disputed topic in recent years, due to inconclusive evidence and a relatively small body of research. The aim of the study was to assess the degree to which training on a visual search task with tDCS may impact these components, if at all. To assess these changes, EEG data was collected from participants randomly assigned to either an active or placebo condition. The same battery of cognitive assessment tasks were administered over the course of 3 lab visits, followed by a 20-minute stimulation while training with an analogous online interface BrainHQ. Post stimulation, participants were assessed using the same battery of tasks from the start of the visit. We anticipated practice and ceiling effects, but aimed to assess whether the time taken to arrive at such effects differed between the active and sham conditions. Analysis of the P300 component during the visual search task was completed using BrainVision software. The P300 is elicited in response to infrequent stimuli, and exhibits plasticity during practice on a task. Results of a mixed-factorial ANOVA between latency over time and condition indicated that there was no significant effect of condition, nor an interaction effect of condition and time. However, there was a significant main effect of time ($p < .001$), indicating that training over the course of nine days changed the latency value obtained for the P300 across both conditions. Behavioral data is currently being analyzed. This study is among the first of its kind to assess the impact of tDCS on the ERP waveform after training. It is our hope that these results will supplement the current body of research, and may provide a foundation upon which to form a consensus on tDCS's ability to elicit change, both neurologically and behaviorally.

Potential Cognitive-Enhancing Effects of Oral Phosphatidylserine in Middle-Age Adults

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Phosphatidylserine (PS) is a phospholipid found in cell membranes and plays an important role in multiple cellular processes. PS is often marketed as a supplement to aid in cognition, is orally bioavailable and is taken up in the central nervous system. Oral PS supplementation has been

demonstrated to reduce declines in attention, vigilance, and memory in aged populations, however, little research has been done to verify the efficacy of supplemental PS in generally healthy middle-age adults. In this study, 13 adult participants (mean age 45.3 years) orally ingested 100 mg of PS three times daily (300 mg/day) or an equivalent placebo for 30 days. After the 30 days, participants were administered the Wisconsin Card Sorting Task (WCST) and the Stroop Color and Word Test to measure facets of cognitive performance. Performance of the two groups was analyzed using ANCOVA, which controlled for body weight and self-reported biological sex. Results indicate no statistically significant difference between the PS group and control group for any of the outcomes in either task (all p 's > 0.20). It is important to note that this is a preliminary analysis of an ongoing research project, so the study may be underpowered. A greater number of participants is necessary to accurately determine the efficacy of oral PS.

What's in a Word? Identifying Emotional Frames of Words Associated with Feminism

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Feminism has become an increasingly popular form of social justice, however, its root beliefs and goals are often debated within our society. Therefore, a two-phase descriptive study was created to examine the specific language that the general public associates with feminism. Distributed through multiple social media platforms, the first phase was a survey that asked participants to list all of the words and phrases that they associated with feminism, regardless of whether or not they agreed with that description. There were 169 participants ($M = 20$, $F = 135$) who provided 1253 responses, which were subsequently coded into 253 response categories, based on an open-coding process of similar themes. Respondents also rated the extent to which their main source of information about feminism came from social media, news reports, informative television, non-informative television, formal learning, family, and friends. Results indicated both males and females listed approximately 7.55 words and phrases in their responses. Additionally, the majority of the participants reported that they derived their knowledge about feminism primarily from their family, formal learning, or social media. Phase 2 of the study investigated the valence, meaning the emotional value that is attached to a stimulus, of the most frequently identified associated terms and phrases. The second survey consisted of the 64 most frequently listed coded responses from the participants who received their information either primarily from social media or news reports and asked participants to identify these terms as either positive, negative, or neutral in terms of their association with feminism. Results indicated the terms with the most robust valence included: strong and brave (positive associations); lack of shaving and short hair (neutral associations); and feminazi and man-haters (negative associates). Both phases of this study contribute to the expanding body of research that aims to develop a deeper understanding of how feminism is regarded in our society.

Measuring Schizophrenia Stigmatized Beliefs after Cultivating Compassion

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Cultivating Compassion meditation is a type of Buddhist lovingkindness mindfulness that has been shown to increase empathy and compassion, increase willingness to engage with stigmatized groups, and decrease one's implicit biases (Burgess, Beach, & Saha, 2017), however its effects on stigmatized beliefs about mental illness have not been examined. This is extremely important as schizophrenia onset typically presents when a person is in their 20s ("Schizophrenia", 2018), and fear of schizophrenia stigmatization has been shown to delay help-seeking in individuals experiencing their first-episode of psychosis (Gronholm, Thornicroft, Laurens, & Evans-Lacko, 2017). Thus, Cultivating Compassion meditation can be used to decrease stigmatization threat and increase empathy towards individuals with a severe mental illness. Seventeen undergraduate students completed a 'knowledge test' about mental illness (Corrigan, 2013) to measure their implicit beliefs before being randomly assigned to either fencing lessons with a partner or stationary cycling with a partner followed by guided Cultivating Compassion meditation (Stanford Medicine). Social exercise (partnered or in a team) can enhance empathy through both top-down and bottom-up cognitive processing (Sevdalis, & Raab, 2014). Following three training sessions over the course of approximately 3 weeks, participants individually completed the 'knowledge test' and then created a five-minute presentation about the causes and symptoms of schizophrenia. Qualitative analysis of the presentations revealed the meditation group had a higher frequency count for mentions of biological schizophrenia causes, more frequently identified symptoms of schizophrenia accurately, and more often mentioned stigmatized concepts than the fencing group. However, higher frequency of mentioned stigmatized concepts in the meditation group were attributed more positively than the fencing group in some facets, like asserting the misconstrued risk of danger associated with the schizophrenic population. Quantitatively, we found a trend towards implicit stigmatized beliefs about schizophrenia decreasing from pre to post test, for both training groups. Our findings suggest yet another beneficial use of mindfulness training, as it may be an accessible, cost-effective way to combat mental illness stigma in an institutionalized setting.

Allies for Equality in STEM: Endorsing a White Male Scientist as an Ally for White Women

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Currently there is an underrepresentation of women in science, technology, engineering, and mathematics (STEM) fields (NSF, 2015). One reason for this lack of representation is that women may experience social identity threat, or worry that their identity will be devalued if they are associated with negatively stereotyped group (Steele, Spencer, & Aronson, 2002), consequently avoiding STEM fields altogether. However, identity-safe cues, representations in the environment that signal support and value for one's identity, minimize social identity threat (Avery et al., 2013; Davies, Spencer, & Steele, 2005; Walton, Murphy, & Ryan, 2015; Pietri, Johnson, & Ozgumus, 2018). Role models who act or are endorsed as allies can serve as an identity-safe cue for underrepresented individuals (Johnson & Pietri, under review), and we explored whether allyship can boost the efficacy of a White male scientist as an identity-safe cue for White women. White females (N=332) viewed the website of a fictitious STEM company and one of four profiles of a successful scientist: a White female, White male, White male ally, or White male endorsed as an ally by his White female mentee. Consistent with previous research, we also examined if stigma consciousness, the extent to which one anticipates

experiencing discrimination due to group membership (Pinel, 1999), impacted whether a role model effectively increased participants' level of trust and belonging. Participants reported their trust and belonging and completed a measure of stigma consciousness. Relative to the White male scientist, the endorsed ally effectively promoted trust and belonging at the fictitious science company. However, stigma consciousness was an important moderator. Specifically, women high in stigma consciousness reported the lowest trust and belonging, unless they viewed the profile of the endorsed ally. The present work offers initial evidence that endorsing a White male as an ally effectively signals identity-safety for White women.

Risk & Resilience: A Cross-Cultural Analysis of Parents' Beliefs about Children's Play and Experiences in the Natural World

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This study examined how Guatemalan immigrant and US-American parents perceive risk in outdoor play environments. Sandseter (2009) defined risky play as 'thrilling and exciting forms of play that involve a risk of physical injury' (p. 4). Through such play, children develop self-regulation, autonomy, and social competence (Drown & Christensen, 2014). The 31 participating parents (16 Guatemalan, 15 United States) had children recently enrolled in an Early Head Start program. Twenty-nine mothers and two fathers participated in a semi-structured home interview with the researcher and a Head Start staff member. Interview questions compared the perceived risk, perceptions of outdoor play, and play routines of parent and child play experiences. Thematic coding demonstrated key similarities and differences in how Guatemalan and U. S. parents perceived risky play in outdoor environments. Both groups reported spending time outdoors as children. However, Guatemalan participants spoke more about their experiences in the natural, unstructured world whereas U.S. parents talked more about outdoor play in the context of structured play environments such as playgrounds. Most parents reflected on risky play as being a joyful and exciting part of their childhood experiences. In both groups, parents' reports of their childhood play included more risk-taking than that of their children. Parents were more likely to afford "risky" opportunities that corresponded to familiar routines; for example, some Guatemalan parents had experience with outdoor cooking, which made them more inclined to teach their children how to light fires at a younger age. All parents emphasized the need for safety in outdoor play environments. U.S. parents were more concerned with physical dangers, such as great heights or busy roads. Guatemalan parents highlighted safety concerns regarding strangers, figures of authority, and unforeseen environmental dangers (e.g., shards of glass). Parents also acknowledged the influence of media reports on their perceptions of community safety. This concern led to reduced opportunities for their children to play outdoors. Implications of the findings for early childhood educators will be discussed.

One Size May Not Fit All: Investigating How the Intersection of Race, Gender, and Stigma Consciousness Predicts Effective Role Models for Black Female Students

Ashanti R. Desauguste and Samira A. Foster (Dr. India Johnson) Department of Psychology

Previous research has found that Black women report greater trust in Science, Technology, Engineering, and Math (STEM) environments after learning about a role model sharing their

racial identity (Pietri, Johnson & Ozgumus, 2018). Research has also found that for Black women high in stigma consciousness, or the extent he or she feels they are likely to be stereotyped because of their identity, feelings of trust were promoted only when learning about a Black female role model. Research has yet to examine who serves as the most effective role model for Black female undergraduates. To address this gap in the literature, we examined how professors who differ in their gender and race promoted feelings of trust at a fictitious School of Science and Engineering. Black female undergraduates ($N = 353$), who were recruited using an online data acquisition platform called Mechanical Turk, viewed a webpage of an artificial School of Science and Engineering and imagined being a student enrolled in that school. Participants were randomly assigned to view a profile of a professor from the school: a White man, a White woman, a Black man, or a Black woman. They then reported their anticipated trust and comfort in the school and completed a measure of stigma consciousness. We found that participants who viewed the Black woman or Black man profile reported the most trust and comfort. However, participants high in stigma consciousness reported the lowest trust and comfort unless they viewed the profile of the Black female professor. That is, only the Black female professor promoted trust and comfort among participants high in stigma consciousness. Building upon previous work, our major conclusion is that exposure to Black male and female role models promotes trust among Black female undergraduates in STEM environments. Likewise, the present work also suggests exposure to role models sharing a common racial identity may help increase Black women's recruitment and retention in STEM.

“It's Not What You Say, but What You Do”: Allyship as a Tool to Attract Black Women to STEM

Samira A. Foster and Ashanti R. Desauguste (Dr. India Johnson) Department of Psychology

Previous work found that Black women who viewed the profile of a White female scientist ally (i.e., someone who valued the unique perspectives of Black women and recruited them into her lab) reported greater feelings of perceived belonging at a fictitious STEM company. However, stigma consciousness, or one's sensitivity to the possibility of experiencing discrimination because of gender and racial identity, was an important moderator. Specifically, participants with higher levels of stigma consciousness anticipated less belonging at the company regardless of the presence of a White female ally. The present work examines if the diversity of a White male ally's research lab can increase feelings of belonging among Black female students across varying levels of stigma consciousness. We recruited Black female students ($N = 548$) via Amazon's Mechanical Turk, an online data acquisition platform. Participants viewed a homepage for a fictitious School of Science and were randomly assigned to view one of five faculty profiles for a professor in the school: a White male ally with a research lab featuring a Black woman (i.e., diverse lab), a White male ally with a research lab lacking a Black woman (i.e., non-diverse lab), a White male non-ally with a diverse research lab, a White male non-ally with a non-diverse research lab, or the control profile of a Black female professor. Participants reported their predicted belonging in the School of Science and completed a measure of stigma consciousness. Results indicate that the Black female and White male ally who had a diverse lab elicited the highest levels of belonging, and this effect was consistent across varying levels of stigma consciousness. Conversely, the White male ally lacking a diverse lab and the White male non-ally lacking a diverse lab resulted in the lowest levels of belonging, and this effect was most pronounced among participants high in stigma consciousness. This research suggests that White

male scientists can encourage belonging in STEM environments among Black female students when actions are prioritized over words.

Nonprofit Organizations and Social Media: Impact on Volunteer Outcomes

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A perpetually expanding form of communication, social media allows businesses to further relationships with stakeholders, as well as promote their reputation and services (Dunn, 2010; Kane, Fichman, Gallagher, & Glaser, 2009; Wilson, Guinan, Parise, & Weinberg, 2011). Profit and nonprofit organizations have leveraged social media; however, there is a lack of quantitative research to support that social media use actually benefits organizations. This study investigated whether nonprofits' social media use was related to their stakeholders' satisfaction with communication. Using a previously developed coding scheme (Lovejoy & Saxton, 2012), the Facebook posts of 24 nonprofit organizations were coded into three main categories: Information (i.e., one-way, top-down information sharing); Community (i.e., two-way messages intended to build connections with followers); and, Action (i.e., messages intended to direct or mobilize followers' activities). The coded Facebook data were matched with consulting data collected one month later from a key stakeholder group: volunteers ($n=2387$). It was hypothesized that, 1) greater use of Information messages would be related to increased satisfaction with top-down communication; 2) greater use of Community messages would be related to satisfaction with bottom-up communication; and, 3) greater use of Action messages would be related to satisfaction with both top-down and bottom-up communication. Results of separate bivariate correlational analyses provided partial support for Hypothesis 3, but did not support Hypotheses 1 or 2. Greater use of Action based messages was significantly and positively related to volunteers' satisfaction with bottom-up communication, but was not to satisfaction with top-down communication. Greater use of Information and Community messages was not significantly related to satisfaction with top-down and bottom-up communication, respectively. These results suggest that Action based messages may be more effective because volunteers felt needed and received straightforward directions on how they could assist. Therefore, organizations may benefit from evaluating the content of their social media campaigns to better integrate Action based messages. Additionally, future research could examine Information and Community based messages and their relationship to outcomes other than satisfaction with communication.

Career Directedness in Community College Students

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Community college students, a largely under-researched population, have a limited amount of time to prepare for their careers before graduating from their institution. Therefore, decisions must be made quickly regarding the path to their future goals. Community college students, in comparison to 4-year university students, have greater diversity in age with *traditional age students* (age 18-24) and *non-traditional age students* (age 25+). The present study examined the impact of career services interventions on career decision making self-efficacy (CDSE) and career engagement in both groups of local community college students, predicting greater CDSE in older students since they have more working experience. Three measures were used in the

study: the Career Decision Self-Efficacy Scale (Betz, Klein, & Taylor, 1996), a measure of people's belief that they can successfully make significant career decisions; the Career Engagement Scale (Hirschi, Freund, & Herrmann, 2014), a measure of how people have prepared for or participated in their career previously; and the Life Orientation Test (Wimberly, Carver, & Antoni, 2008), a measure of optimism. The survey was distributed by the career services directors of two local community colleges in North Carolina after each visit to career services at their institution. Recruitment difficulties led to a small number of participants; however, the results of preliminary analysis aligned with and supported the current literature. As levels of optimism increased, so too did levels of career engagement and CDSE. This was also consistent in older students, as research suggests, where they had greater levels of career engagement and CDSE due to extended time in the workforce. While the results yielded in this study were not statistically significant due to the small sample, they support previous findings that career services at community colleges are an effective tool for students to utilize in their career development process. It also supports previous arguments that these departments, considering the impact they have on students, are generally understaffed and underfunded. Therefore, while other studies suggest expanding the services offered without making institutional changes, this study suggests the existing services require additional funding and resources before improvements are possible.

The Role of Corrective Feedback in Memory for Contextual Details

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Memory is typically better for information that is self-generated rather than passively read (Slamecka & Graf, 1978). Surprisingly, incorrect generation of information can improve memory for the correct answer if corrective feedback is given (Metcalf & Kornell, 2007; Kornell, Hays, & Bjork, 2009). Prior research has shown that generation can impair memory for the contextual details (e.g. color) while simultaneously enhancing memory for the information itself (Mulligan, 2004). In contrast, our recent research found that context memory was enhanced by corrective feedback, compared to confirmatory feedback (Overman, Bernhardt, & Stephens, under review). Neuroimaging findings also suggest that corrective feedback plays a role in enhancing context memory because the hippocampus is involved in both memory for contextual details (Diana et al., 2007) and in the incorporation of feedback during learning (Dickerson & Delgado, 2015; Wiklund-Hornqvist, Andersson, Jonsson, & Nyberg, 2017). It is possible that attention plays a role in this process. Corrective feedback may cause the learner to direct more attention to contextual details presented immediately after the feedback. To investigate this, we tested the extent to which the positive effect of corrective feedback on context memory depends on the timing of the contextual information relative to the feedback. We extended our prior work (Overman, Bernhardt, & Stephens, under review) on generation, feedback, and context by modifying the timing of when participants received context information. Participants read or generated category exemplars, and typed them in blue or yellow font (contextual detail), with half of their generated responses randomly assigned as "correct" and given confirmatory feedback, and the other half assigned as incorrect and given corrective feedback (including the alternate exemplar that was the "correct" response). We found the enhancing effect of corrective feedback on context memory was reduced when the context preceded the feedback, suggesting that attention is an important factor in the effect of feedback on memory for contextual details.

These findings contribute to the field of learning, by informing how the timing of corrective feedback helps individuals better remember context information, and when the connection between an item and its context is strengthened, the item itself is better remembered.

Preschoolers' Social Perspective Taking, Storytelling, and Art

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This study examined the relationship between preschoolers' social perspective taking, artistic representational ability, and storytelling skills, and how audience and social context may influence these variables. Social perspective taking is defined as the ability to consider another's thoughts, feelings, and beliefs in a social situation (Braswell, 2007; Mori & Cigala, 2015). Artistic representational ability is a child's ability to draw a recognizable picture (Braswell, 2007). Storytelling ability is the level and complexity of a child's narration of an event sequence (Curenton, 2004). Thirty-two children between the ages of 48 to 71 months participated in one 30-minute session comprised of two tasks. The first task, social perspective taking, consisted of the child watching four vignettes of someone drawing a stuffed animal and then leaving with the toy (Braswell, 2007). A second actor then entered and saw the drawing, and the child was asked to explain whether or not the second actor could identify it. Two of the drawings were recognizable and two were unrecognizable. The child was then asked to draw a picture of a stuffed rabbit, before moving on to the second task: storytelling and drawing (Curenton, 2004). The child was shown a wordless book and asked to make up the story, creating and illustrating an ending incorporating the stuffed rabbit. Half of participants (experimental group), randomly assigned, were told their drawings would be shown to their parent/guardian to guess its identity. The remaining children (control group) were told nothing about audience. Each dependent variable was coded based on prior literature. Analyses indicated a significant positive correlation between social perspective taking, drawing ability, and age in months. Unlike prior research findings, in this study audience and social context did not have any significant influence on children's drawings. This may be explained by the overarching importance of age for preschoolers' drawing abilities, above and beyond the context, and the presence of the researcher. Implications of the findings for early childhood education and development will be discussed.

It's Not You, It's Your Job: The Influence of Job Type on Perceptions of Older Workers

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Changing age demographics in modern workplaces show that older workers are staying in the workforce longer and delaying retirement more than in the past. Thus, understanding people's perceptions of older workers is a relevant concern for individuals and organizations. Other studies have investigated people's perceptions of older workers based on the workers' age; however, the question remains whether perceptions of older workers are influenced by situational factors such as job type. Rutledge, Sass, and Ramos-Mercado (2016) identified and defined "old-person" jobs as jobs for which older adults are hired to a greater extent than younger workers. The current study used Rutledge et al.'s (2016) job type distinction to examine whether job type moderated the relationship between age of a worker (young versus old) and

perceptions of the worker. Specifically, it was hypothesized that: 1) There would be a main effect of age such that older workers would receive lower evaluations, regardless of their job type; and, 2) There would be an interaction between age and job type, such that older workers in “young-person” jobs would receive the lowest evaluations. These hypotheses were tested using an experimental design, in which age (young, 32; old, 55) and job type (“older person job”, real estate agent, “age neutral, insurance underwriter, “younger person job” computer support specialist) were manipulated and presented in six short vignettes. All vignettes contained a short description of the worker’s performance over the last year. Participants ($n=218$; age range=18-24) were randomly assigned to read one of the six short vignettes and then completed a modified ageism scale. The experiment was conducted online through the Qualtrics survey platform. Data were analyzed with a 2-way analysis of variance (ANOVA). The results did not support the hypotheses; that is, there was neither a main effect of age nor an age x job type interaction. In addition, there was no main effect of job type. People’s perceptions of older workers are not significantly affected by their job type. Given these findings, researchers and practitioners may benefit from examining additional situational factors (e.g., organizational culture) that may contribute to negative perceptions of older workers.

Anxiety Management on Campus: An Evaluation of a Mobile Health Intervention

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Mental illness is highly prevalent among young adults in the United States, with anxiety disorders being one of the two most common psychiatric conditions young adults face. Despite the availability of effective treatments, rates of help-seeking for this issue remain low among undergraduate students. Considering that technology is widely used by college students, one possible solution to overcoming the barriers to treatment-seeking is the use of mobile health (m-health), a set of electronic tools that focuses on improving health care through the development of phone applications. In the present study, 18 undergraduate students from a southeastern liberal arts university utilized MindShift, an anxiety-reducing phone application (app), for three weeks. Participants completed assessments at three time points measuring somatic anxiety, general anxiety, depression, and panic symptoms. Participants also responded to open-ended questions evaluating app use, perceived outcomes, and app satisfaction. Analyses of variance showed significant reductions in somatic anxiety ($F_{3,45} = 7.75, p = .001$), general anxiety ($F_{3,45} = 15.90, p < .001$), and depression symptoms ($F_{3,45} = 6.48, p = .004$). Analysis of variance for panic symptoms was not significant. Participants were generally pleased with MindShift’s ability to manage anxiety symptoms, provide new coping strategies, and be used easily. Overall, participants were generally satisfied with the app but reported a few challenges, including technical difficulties and repetitive content. In conclusion, MindShift demonstrated efficacy in managing anxiety symptoms and acceptability among college students. MindShift, or similar apps, should be further investigated as a tool for colleges and universities to use to combat the high levels of stress and anxiety their students are facing.

Neural Activation Related to Successful Memory Retrieval

Joanna M. Salerno, Kayla E. McGraw, M. Andrew Rowley, and Alexandra P. Giglio (Dr. Amy Overman) Department of Psychology

Healthy aging is associated with impairments in memory abilities, in particular, associative memory. Healthy older adults experience a deficit in associative memory, which is the ability to form links between pieces of information (Naveh-Benjamin, 2000). The formation of these links occurs in the hippocampus, which is a part of the medial temporal lobe. Healthy aging is associated with a decrease in hippocampal volume (Raz et al., 2005), making the formation of associations increasingly difficult. Research in younger adults has suggested that different types of associations are mediated by different subregions of the medial temporal lobe (Diana, Yonelinas, & Ranganath, 2012). Furthermore, congruency, defined here as the similarity of presentation of stimuli between study and test phases, is a factor that may impact associative memory. The objective of this experiment was to compare two different types of associative memory (item-item and item-context memory) in younger and older adults. The same types of stimuli were presented as either two items or an item and a context by manipulating the configuration of the stimuli at encoding. Crucially, visual configuration was also manipulated so that stimuli presentation at retrieval was either congruent or incongruent to encoding presentation. Our results indicate differences in processing of item-item and item-context associations between age groups. Our neuroimaging results also found that congruent and incongruent associative retrieval are supported by the recruitment of different regions of the medial temporal lobe. This suggests that visual configuration of stimuli influences the neural processes which support associative memory. These findings contribute to scientific theories of associative memory and age-related cognitive decline.

Decision-Making Factors in Charitable Giving: Effects of Linguistic Framing on Likelihood and Amount of Donation

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A majority of non-profit organizations rely upon donations to support their operations, which ultimately benefit the overall community. The present study investigated factors potentially associated with how one responds to a charitable donation request and/or whether one chooses to provide charities and non-profit organizations with needed support. Stemming from previous research, in which the language employed by a non-profit was found to result in more beneficent donation patterns (Epting, Phelan & Brown, 2017), the current experiment used the same independent variables of fund name (animal care, general operating, and veterinary funds) and level of explanation (overview, categories, and example), as well as a new context variable (high, low, and no context) derived from known compliance methods. The phenomena that served as inspiration for the context variable were the foot-in-the-door technique, where starting with a smaller request increases the likelihood of agreement to a larger subsequent request, and the door-in-the-face technique, where agreement to a smaller request is more likely following a greater, less attainable one. Conducting an experiment via Qualtrics, the researchers borrowed language from the Conservator's Center, an animal welfare non-profit organization, manipulating the particular fund names that one may donate to as well as the extent of fund description. Prior to viewing and responding to donation requests, participants viewed contextual information about the organization, which included either its daily or yearly costs of either food or electricity; this represented the "context" independent variable. For each donation request prompt, respondents comprising Elon University students, faculty, and staff were prompted to rate their likelihood to donate to that fund (0-100%), as well as the amount they would likely donate (\$0-

\$100), providing the two dependent variables. It was hypothesized that the three independent variables (fund name, level of explanation, and context) would individually influence respondents' likelihood and amount of donation. Possible two-way or three-way interactive effects between the variables were also analyzed. Results will form the foundation of a future field study, which will occur in the Center's physical gift shop.

The 100 Languages of Children: Inquiry in a Reggio Emilia-Inspired Preschool

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The study purpose was to examine how educators, peers, and the environment support inquiry in a Reggio Emilia-inspired preschool. Reggio Emilia is a pedagogy developed post-WWII in Italy, based on European and American educational theories (Edwards, Gandini, & Forman, 2012). The philosophy fosters intellectual and emotional relations through personal expression, such as spoken language, shadow play, sculpture, music, and much more (Edwards et al., 2012). Young children develop complex understandings of concepts when teachers guide inquiry processes such as observing, predicting, questioning, evaluating and comparing (Lindner, Powers-Costello & Stegeline, 2011). Also, children develop explanatory insights in specific domains that form a cognitive common ground to build more complex scientific understandings. These domains include mechanics (physics), folk biology, and chemistry (National Academy of Sciences, 2007). Therefore, we investigated the connections between children's exploration of these rudimentary domains of science as they participated in different activities (art, storytelling, gardening, mapping, constructing, and pretend play). Naturalistic observations were conducted at a Reggio Emilia-inspired preschool. Videorecordings captured interactions between two teachers and seventeen children aged three to five years over 24 school days throughout one calendar year. For this study, 41 events on four days were selected for coding and analysis. High levels of inquiry processes, including predicting, evaluating and concluding, were observed across activity types. Teachers and materials in the environment most often supported inquiry processes. Domains of science were coded into three parent categories (chemistry, physics, and biology). Chemistry was observed most often in art and constructing, with subcategories of reversible and irreversible construction coded in constructing activities such as gluing a wood sculpture, and combination coded in art activities such as paint mixing or blending pastels. Physics was further coded into moving objects, directing movement, and representing movement, all of which were seen most often in art and constructing activities. Finally, biology was further coded into perspective, sense of wonder, and transformation, most often seen in gardening, pretend play, and art. The findings support and extend previous research showing that a Reggio Emilia-inspired pedagogy offers a rich context that effectively engages and supports preschoolers' inquiry and emergent scientific reasoning.

Examining the Negative Repetition Effect in Older Adults

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In the negative repetition effect (Peterson & Mulligan, 2012), rhyming cue-target word pairs are studied in a list organized by taxonomic category of the target words. Subsequent free recall of target words is reduced by first studying the same cue-target pairs in a disorganized list. This

result is predicted by the item-specific-relational framework for memory, which posits a trade-off between processing of within-trial versus between-trial associations. Prior research in young adults has shown that the left ventrolateral prefrontal cortex (VLPFC) is important in creating relationships between items, and that VLPFC shows differences in activity in older adults compared to younger adults during associative tasks (Addis et al., 2014). Thus, neural differences in relational processing could lead to differences in the negative repetition effect across age groups. The objective of the present study was to replicate Peterson & Mulligan's (2012) study, with the addition of an associative recognition task, in older adults in order to examine the differences in the negative repetition effect between younger and older adults. Participants from both age groups studied rhyming word pairs in a list organized by taxonomic category only or with an initial disorganized list prior to an organized list. At retrieval, all participants completed a free recall and an associative recognition task. The present study did not replicate the negative repetition effect in older adults or in younger adults for free recall, nor was the effect found for associative recognition. This research is important for two reasons. First, replication is a critical component of research credibility. Findings that cannot be replicated are less credible and should not be used to inform our understanding of aging and memory. Second, older adults are the fastest growing population in the United States (Vincent & Velkoff, 2010). Knowing what does, and does not, affect memory in older adults supports our ability to create strategies to enhance memory.

Public Health Studies

“I pumped, I didn’t breastfeed”: Toward a More Family-Centered Care Culture for NICUs and the Donor Human Milk Bank System

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Recent scholarship has identified barriers associated with providing human milk, including donor human milk (DHM), to neonates in the neonatal intensive care unit (NICU). However, little is known about the lived infant feeding experience of parents whose infants are in the NICU. This qualitative study utilized participant observation in two regional level-3 NICUs to document how parents were involved with infant feeding. Semi-structured, in-depth post-discharge interviews were conducted with 17 mothers of very-low-birth-weight (VLBW) infants to elicit infant feeding narratives. Participants ranged in age from 23-42 years, had 1-3 children, and had education levels that ranged from a high school degree to a PhD. Infant gestational ages ranged from 23-39 weeks. Questions addressed feeding intentions, support of infant feeding goals, and post-discharge feeding. A thematic and structural narrative analysis was employed. Narratives showed profound vulnerability and powerlessness, as providers often preferred human milk expression, or pumping, over direct breastfeeding. For this reason, mothers who had the intention to breastfeed often never reached that goal and produced a supply via human milk expression only. Participants sought feelings of control and “bountifulness” to counteract their powerlessness through consistent human milk expression, and often produced large amounts of human milk, which left them with surplus human milk after NICU discharge. Some participants stated a desire to donate this surplus, but noted the difficult and time consuming procedures associated with the DHM system. Participants narratives were non-linear in ways that suggested implicit trauma. Due to the long-term powerlessness experienced by participants, providers

should integrate family-centered care, an approach to care that aims to reduce barriers of access and control to families, into the NICU and DHM system. Additionally, narrative-based therapies utilized during and after the NICU should be incorporated into psychosocial support of families to help mothers better process their infant-feeding experiences and transition to motherhood. DHM policies that reduce donor barriers should be considered to help mothers of VLBW infants make meaning of their infant's feeding method and reduce feelings of implicit trauma by allowing them to contribute to the health of other infants in the NICU.

Migrant Health Experience in Alamance County: Provider and Patient Perspectives on innovation in Community-Based Health Care

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Background: As rural and suburban communities across the United States become increasingly diverse, there is a need to better understand the ways in which health-care providers adapt to meet the needs of their changing patient communities. North Carolina's Piedmont region is a community in which new immigrants and migrants increasingly relocate. The role of community based Federally-Qualified Health Centers and volunteer run clinics were examined to understand how the increasingly vibrant and diverse communities' needs are being served. **Methods:** This qualitative research study compared the perspectives of providers and their patients, primarily those that speak Spanish. Twelve semi-structured interviews were conducted with community-based health-care providers, and nine parallel interviews with patients, in four health-care facilities in NC's Piedmont region. Questions were asked about the providers' role at the clinic and the available support for migrant populations while patients were asked about their experience as well as their family life and support networks. Interviews were transcribed and NVivo 10 software was used for qualitative data analysis using Everett Rogers' diffusion of innovations theory as a framework. **Results:** Findings suggest that community-based health centers are incorporating feedback loops between their providers and their patients to expand their range of services to improve the patient experience. However, providers must continuously innovate to provide high standards of quality care despite limited funding. Providers are taking the time to deliver patient centered care, and patients are choosing to seek care at these facilities due to the support they are receiving from their providers. By making language a priority, the NC Piedmont region is better supporting the migrant population for those that seek care. Unfortunately, the current political climate creates fear for patients seeking care, but providers are adapting their practices in attempts to support their patient population. **Conclusion:** This research provides a unique opportunity to compare the perspectives of health-care providers and their patients in NC's Piedmont region. With an increasingly diverse population, health-care providers in a community with limited diversity must adapt. Results may help to inform future health-care practices in this region, and also provide insights to other communities experiencing similar demographic change.

Translating Psychosocial Standards of Care into Assessment: A Tool for Advocacy

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Background/Purpose. The Standards for Psychosocial Care for Children with Cancer and Their Families Psychosocial are well established and grounded in research. Clinical facilities aim to use standards to drive services and supports available to pediatric oncology parents and their families. However, currently there is not an easy way to assess the translation of these standards for providers, patients, and families. The goal of this project was to translate standards into assessment tools for healthcare providers and for families of deceased and surviving children. **Methods.** Online surveys and in-depth interviews were conducted with providers and parents to better understand their perceptions of the availability, accessibility and the role that psychosocial services play in the care of pediatric cancer patients and families. Modified versions of psychosocial standards were shown to providers including clinical social workers, child life specialists, physicians, nurse practitioners, nurses, chaplains and parents who offered feedback on questions and language usage. Appropriate changes were made in order to make terms applicable to a wide variety of health care providers and parents. **Results.** The language of standards had to be significantly reworded for parents. Parents appeared to struggle with conceptualizing psychosocial services beyond those that directly affected their child. The category of “unsure” was added to service availability. Providers emphasized the importance of psychosocial supports for families although acknowledging that they do not always know what resources are, or need to be, available. **Conclusions and Implications.** Standards of psychosocial care should be adapted to a variety of audiences to better understand the scope and quality of care. Findings can be shared with decision makers to argue for additional resources. The integration of multiple perspectives add data to target specific changes to existing services. Future research can use these tools to assess family needs and translate needs into advocacy for psychosocial supports. **Learning Objective.** The participant should be able to identify how standards need to be translated to effectively assess provider and family perspectives on the availability and accessibility of psychosocial services.

Biological, Psychological, and Social Factors Impacting Anorexia Nervosa on Undergraduate Campuses

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According to the National Association of Anorexia Nervosa and Associated Disorders 30 million people have an eating disorder in the U.S., and every 62 minutes one person dies from an eating disorder. Eating disorders are mental health disorders, and a leading cause of mortality (ANAD, 2017). Anorexia Nervosa is an eating disorder characterized by an abnormally low body weight, intense fear of gaining weight, and a distorted perception of body weight (Mayo Clinic, 2017). No research has conclusively determined how biological, psychological, and/or social factors affect the development and progression of an individual's eating disorder. This project aimed to identify the relationships among these factors to determine which, if any, influence the occurrence of Anorexia Nervosa. Non-random purposive sampling was used to recruit participants. Undergraduate students (N=110; 108 female, 2 male) participated in this quantitative study. After granting consent, prospective study participants were screened into the study using *Sick Control One Fat Food (SCOFF)* (Morgan, Reid, & Lacey, 2000; $\alpha=0.95$), a 5-item questionnaire used to detect eating disorders. Study participants completed the *Eating Disorder Determinants (EDD)* (Pine, 2017; α =unknown) survey, which measured the frequency

and severity of biological, psychological, and social factors that may contribute to the occurrence of Anorexia Nervosa. Participants were also asked to describe self-harm behaviors. Initial cross-tabulation and chi-square analyses yielded statistically significant relationships among psychological factors and the occurrence of Anorexia Nervosa. In the second phase of analysis logistic regression with interaction terms, and categorical data analyses (measures of association, tests of independence, tests of symmetry) will further explain the relationships among biological, psychological, and/or social factors, and the occurrence of Anorexia Nervosa. Study findings will increase awareness about eating disorders on college campuses, and potentially lead to increased dialogue about supporting students' mental health and well-being.

Effects of Helicopter Parenting on the Health Care Transition Readiness of Typically Developing College Students: Perceptions of Higher Education Staff

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Previous research has found that helicopter parenting is associated with increased risk of depression/anxiety in college students. However, little is known about the effects of helicopter parenting on college students' ability to manage their own health, despite the fact that the transition to college is frequently associated with the transition to adult-oriented health care. Higher education professionals are in a unique position to shed light on the effects of helicopter parenting on college students' health care transition readiness. This project investigates how higher education professionals view helicopter parenting and subsequent effects on the transition readiness of typically developing undergraduates. A purposive snowball sample of nine higher education professional staff from a mid-sized university in the southeast completed semi-structured interviews about their experiences with helicopter parenting and how it influences college students' ability to manage their own health. The participants were staff members from the Office of the Dean of Students, Residence Life, and Parent Engagement, and were chosen for their involvement and interactions with student health. Transcribed interviews were coded for emergent themes. Qualitative analyses revealed that participants experienced frustration with the lack of health self-management skills among college students. Participants noticed a decline of health care-related knowledge among college students over the past decade and a shift towards college students becoming more reliant on their parents for health-related concerns. Participants frequently interacted with parents who manage their students' health for them and felt this was detrimental to the students' development of important health self-management skills. Specific health self-management deficits included making appointments, going to appointments without a parent, and managing symptoms of an illness. Participants identified a need for strategies to better educate parents on how to best prepare their student to manage their own health and successfully transition into adult-oriented health care. Resources that target adolescents and young adults with a chronic health condition can be adapted to typically developing college students in order to improve the level of transition readiness and development of health self-management skills.

The Influence of Family Systems Theory Obesity Treatment on Adolescents' and Parents' Perspectives of Family Dynamics

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One approach to treating pediatric obesity applies Family Systems Theory (FST), which seeks to engage the entire family in treatment. Previous FST-related obesity treatment research has primarily focused on the impact of family functioning on weight status and weight-related behaviors. However, there is little research that examines the influence of treatment on the familial unit. This study investigates how FST obesity treatment influences adolescents' and parents' perspectives on family dynamics. Thirteen adolescents enrolled in a family-based obesity treatment program and their mothers completed semi-structured interviews. The mean age of adolescents was 14 years (range 12-18). The adolescents identified their races as Hispanic (n=6), African American (n=3), biracial (n=3), and white (n=1). Nine adolescents were female. Interview questions centered on how participation in the program influenced family dynamics and parental influence on healthy lifestyles. Adolescents completed the Lum Emotional Availability of Parents (LEAP) measure to assess the emotional availability of parents. Transcribed interviews were analyzed using conventional qualitative methods. Analyses revealed four primary themes: changes in relationships, stress, food disagreements, and support. The majority of adolescents (n=9) did not believe their relationship with their parent changed due to FST obesity treatment, although they did report enjoying the family-oriented activities. If a change in relationship was noted, both adolescents and parents indicated a positive change. Most adolescents (n=10) reported that FST obesity treatment neither caused nor alleviated stress. However, most parents (n=8) believed that treatment alleviated stress. In addition, the majority of both adolescents (n=12) and parents (n=10) stated that food disagreements were rare after FST obesity treatment. Almost all adolescents felt support from their parent, commonly when deciding food quality/quantity and exercise habits. Findings suggest that both adolescents and parents felt family stress and food-related disagreements were reduced due to participation in FST obesity treatment. Mean score on the LEAP was 77.62 with a standard deviation of 9.85, indicating relatively high levels of emotional availability from their mothers. Providers should be aware of the benefits of FST-based obesity treatment and strive to build upon family strengths in order to improve health outcomes.

An Analysis of First Year Students' Mental Health Help-Seeking Behaviors and Institutional Perceptions

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Adolescent mental health, while a widely researched topic, lacks information regarding the impact of the high school-college transition on how students seek help for their mental health. Help-seeking may be defined as seeking support and treatment from professionals, family, peers, clergy, the Internet, and other significant relationships. While 40% of college students in the United States meet diagnostic requirements for the classification of mental illness, around 80% of youth do not receive needed mental health services. Students entering college experience a variety of old and new stressors that contribute to their mental well being, however, they face many barriers in seeking help. The primary question to be explored by this research is: How does the transition from high school to college impact mental health help-seeking behaviors? Additionally, what are student perceptions of the efforts made by institutions to facilitate help-seeking? Understanding how behaviors change over a specified period of time, as well as how students perceive help-seeking efforts by institutions, can assist the field in better reaching

vulnerable groups. In order to address the major questions in this research, surveys have been distributed to first-year Elon University students (n=42), and will assess help-seeking behaviors and perceptions of institutional efforts. Follow up interviews (n=16) have been conducted to obtain a more in-depth understanding of these topics. Lastly, high school guidance counselors (n=5) have been interviewed by phone in order to ascertain current practices that promote help-seeking prior to the transition. Results thus far indicate changes in students' methods of seeking help, as well as that few students who think that they have a mental health issue seek professional support or diagnoses. Most respondents rely on their parents and friends for support. The project is expected to be complete by early April 2018.

Refugee Health: A Quality of Care and Patient Needs Assessment for Refugee Patients at a Community Health Center

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In 2016, more than 85,000 refugees migrated to the United States expanding upon the existing 3 million resettled refugees currently living in the United States. Refugees are leaving their country of origin due to fear of persecution based on racial, religious, social and political identities. Prior to their migration to the United States, many refugees have spent a significant amount of time in low resource refugee camps with a high stress climate, further exacerbating chronic and acute illnesses. Once arriving in the United States, many refugees encounter significant difficulties navigating the US healthcare system due to financial, linguistic and cultural barriers. Employment can be difficult to obtain without prior work experience or English proficiency, creating financial stress and minimizing access to healthcare. Prior research shows that refugees report challenging healthcare experience derived from language barriers, such as the inability to schedule an appointment or read the information written on a prescription bottle. Additionally, refugees report mistrust of American healthcare providers due to patient perceptions of judgment, inferiority and lack of patient-provider respect. The combination of these complex barriers creates a challenging environment for this vulnerable population to receive care. In an effort to assess the most salient barriers to refugee health, previous studies have found success in directly asking the refugee patients for feedback based on their patient experiences. This current study aims to understand the barriers, challenges and opportunities to facilitate positive healthcare experiences for Congolese, Karen, Burmese, and Syrian refugees in a community health center located in the state of North Carolina. Through interpreter-assisted interviews, qualitative and quantitative data related to prior patient experiences and opportunities for future improvements were collected from 33 individuals. Study findings will assist healthcare providers and community members to combat the unique barriers necessary to improve the overall quality of healthcare that refugee patients receive.

Religious Studies

French Islamophobia from the Revolution to Today

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Europeans have represented Islam inconsistently over the last millennium. In their earliest encounters with Islam, Europeans understood the Eastern religion to simply be a heretical form of Christianity. Today, Islam is commonly perceived as, “barbaric, irrational, and sexist, in contrast to the civilized, enlightened, and gender-equal West”. In other words, the evolution of how the West conceptualized Islam has ultimately concluded in an assumption that Islam does not fit in an ideally secular society. This assumption began to be constructed during the Enlightenment period as Feudalism declined and diverse populations challenged religion’s place in society’s institutions. While the Enlightenment inspired similar responses in many parts of Europe, I will be focusing specifically on France and Enlightenment values around the time of the French Revolution. In this paper, I will argue several points. First, I will contend that the French Revolution’s attempt to establish reason as the primary source of legitimacy and authority functioned as a religion in-of-itself; second, that the use of Islam in French literature to disguise criticisms of the Church have contributed to a negative western understanding of Islam; and third, despite having a moment of positive consideration in France by Voltaire, a revolutionary author, Islam is now seen as inconsistent with secular society. To illustrate my arguments, I will analyze Durkheim’s reflections on the sociological effects of the revolution, Voltaire’s representation of Islam in *Mahomet*, and the differences between “acceptable religion” and Islam. By doing this, I hope to highlight the misrepresentations of Islam in French culture, with hopes that the conclusions made in this paper will be applied to a greater Western understanding of Muslim xenophobia.

Poses, Pujas, and Prayers: Intersections between Yoga and Religion

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Drawing on extended ethnographic research in the United States and India, this paper examines the intersections of religion and modern yoga. Modern yoga traditions exist in a complex discursive field populated by contested ideas about religion, secularism, transnationalism, and spirituality. Recent academic scholarship has taken on the task of historicizing and defining the emergence of secularism and spirituality as distinct from the more institutionalized category of religion (e.g., Jain 2015, van der Veer 2014). I argue that although the categories of religious, spiritual, and secular often seem to produce disparate meanings, they cannot ultimately be distinguished as truly separate entities in contemporary yoga contexts. This paper relies on multi-sited ethnographic fieldwork that entails more than 60 interviews and participant-observation conducted during four stints of study and research in India as well as two years of intermittent fieldwork in the United States. My research participants expressed a wide range of perspectives on whether yoga is or is not “religious”: for example, a Muslim practitioner told me that yoga is “universal” and incorporates “no religion,” while a Sikh participant explained that yoga is universal because it encompasses *all religions*. Others described yoga as “spiritual,” something distinct from institutionalized religion, and another practitioner claimed that the “cultural background is the same” for yoga and Indian religion. These classifications of religious, spiritual, and secular are best understood as porous categories which offer mutually constitutive frameworks related to practice and belief. Modern yoga thus serves as a platform for discourses that both reflect and actively shape contemporary understandings of religion in these contexts and contribute to ongoing conversations about the nature of religion within the field of Religious Studies.

The Development of Malcolm X's Understanding of Race

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As the Nation of Islam's (NOI) premier minister, Malcolm X held an influential position during the escalation of the civil rights movement in the early 1960s. One of the NOI's major theological objectives was to reframe America's understanding of racial categories by assigning positive ethical conditions to blackness and negative conditions to whiteness. Though he is often remembered for defending this controversial view, Malcolm X's legacy is better understood in the context of the ideological shift he underwent after his removal from the NOI. After completing the *hajj* Malcolm X admitted a drastic change in his understanding of race, admitting for the first time in 1964 that he no longer viewed racial categories as essential or representative of ethical standing. This paper tracks the evolution of Malcolm X's view of race through his public addresses, beginning with his address at Yale University in 1962 and ending with his final speech in 1965, titled "After the Firebombing". After fully developing his new position in "Letter from Mecca", Malcolm X used his understanding of race's constructed nature to inform his plans for fighting injustice against Black Americans. Malcolm X saw the entire Western world as having created and assigned meaning to contemporary racial categories and he dedicated his later career to breaking down this system. Rather than discarding race, Malcolm X wanted to create a new moral geography and provide greater agency to what he calls "the dark world". As I will show, Malcolm X's final speech, "After the Firebombing," provides a particularly detailed account of his new views both on race and the solution to racial injustice. Ultimately, his understanding of each appeals to a global community of blackness comprised of all races oppressed by Western colonial powers.

Religion and Migration in Japan: The Integration of Japanese Spirits into the Japanese-Brazilian Pantheon

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When Japanese immigrants first came to Brazil after Japan's economic crisis of the early 1900s, many ended up staying through World War II, marrying locally, and rapidly rising to enjoy great socio-economic status in Brazil's postwar boom. A few generations later, nevertheless, history repeated itself, and the once-elite Japanese-Brazilians migrated back to Japan due to Brazil's economic crisis and Japan's economic boom of the late 1980s. These mixed-race *Nikkeijin* (Brazilians of Japanese heritage) soon discovered Japan's so-called "allergy" to immigrants and were left no choice but to take on socially-undesirable jobs in the manufacturing sector, especially in the automobile industry. Subsequently, they now occupy a clearly identified place as second-class citizens at the bottom of Japan's social hierarchy. As a form of coping mechanism to their inevitable feelings of alienation, social and economic displacement, and cultural malaise, many of these Japanese-Brazilians continued the practice of the distinctive South American tradition of Umbanda. Ever since this tradition was first introduced in Japan by these immigrants in the late 1980s and early 1990s, a further layer of multi-ethnic, cross-cultural and interreligious cross-pollination has been occurring. Second- and third-generation Japanese-Brazilians, who reverse-emigrated to the land of their parents' and grandparents' birth for economic reasons, are further syncretize their Brazilian Umbanda deities with the local spirits of

dead Japanese samurai, Buddhist monks, and doctors of traditional medicine (kanpō). Through an analysis of various religious studies and sociological sources, this paper will demonstrate the extent to which the expanding Umbanda pantheon in Japan mirrors and addresses the challenges faced by these approximately 230,000 Brazilian *Nikkeijin* immigrants. It will argue that these *Nikkeijin* immigrants are currently incorporating local Japanese deities into their syncretic pantheon as a response to being culturally marginalized. This research is significant because this reverse migration has led to the fusion of distinct cultures and religions that has created a community that does not quite fit in either location.

In WOD We Trust: Christianity, CrossFit, and Conversion

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Noting the growing popularity of the extreme fitness regimen called CrossFit, which boasts over 7,000 “boxes,” or gyms, in the U.S. alone, insiders and outsiders alike have referred to “the sport of fitness” as a “cult.” Though less exciting than popular conceptions of “cults,” which call to mind extreme rituals and brainwashing, CrossFit can be understood in the sociological sense, as a religious group with a shared set of practices (Richardson, 1993). Applying this description to CrossFit has historical and functional validity. While Religious Studies scholars have explored the role of religion in team sports and in the fitness movement more generally (Griffith, 2004), and social scientists have taken on the classification of CrossFit as a cult (Dawson, 2015), a study of CrossFit that incorporates the various Religious Studies methodologies has yet to be published. This paper first situates CrossFit in the historical trajectory of Muscular Christianity, the fitness culture of evangelical Christianity, then employs semiotic and narrative analysis to evaluate the stories of CrossFitters as conversion narratives. Since conversion narratives are an important genre within evangelical Christianity, they provide a productive point of comparison when studying CrossFit as a form of “Muscular Christianity.” The stories of three CrossFitters, collected from CrossFit, Inc.’s public YouTube channel, are examined, demonstrating that CrossFit is a product of America’s distinct religious and cultural landscape and CrossFit stories function like the conversion narratives emphasized in evangelical Protestant Christianity. This research project has implications for the study of religion and culture by offering an example of the complex interplay of a religious tradition and an increasingly popular cultural phenomenon, Evangelical Christianity and extreme fitness, and applying religious studies methods to this nontraditional subject.

Rhea Silvia: Rome's Virgin Mother

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This research aims to study the figures of the Vestal Virgins in the context of the Roman Empire to assess how these women functioned as sex and gender exemplars in the cultural milieu of their society. As priestesses of the Roman goddess of hearth and home, Vesta, the Vestals’ identities were dependent on their physical virginity and service to the temple in the Roman Forum. As one of the most famous Roman women, the Vestal Rhea Silvia (mother of the founders of Rome) provides this study with a fascinating focal point for its analysis of these women in the context of Roman history and culture. By completing close readings of two primary source versions of Rhea Silvia’s story located in Ovid’s *Fasti* and Livy’s *History of Rome*, this study utilizes

both historical-literary analysis and contemporary gender theory to evaluate the function of Rhea Silvia in Roman myth and history. Suzanne Dixon's method of analyzing primary sources that is detailed in her book *Reading Roman Women* informs this study's historical-literary analysis, and Judith Butler's book *Bodies That Matter: On the Discursive Limits of Sex* provides the contemporary gender theory used to evaluate the social and cultural function of Rhea Silvia's enactment of gender and sexuality. The anticipated results of this research hope to produce a nuanced reading of Rhea Silvia in both Ovid's *Fasti* and Livy's *History of Rome* that evaluates how this Vestal virgin navigates and interacts with the complex framework of gender and sexuality as it operated within Roman society. The intended resulting analysis will also situate the figure of Rhea Silvia within the greater ideological and religious significance of the cult of the Vestal virgins as it operated within Roman society, religion, and culture.

Nordic Practice as Christian Magic

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For centuries, Norse mythology and its related traditions evolved constantly by amalgamating influences from before the early Bronze Age well into the first introduction of Christianity. Though multiple kings throughout Scandinavia's history attempted to abruptly bring about Christian conversion, it took the steady presence within the daily life of common Scandinavians over generations to succeed in fully changing religious identity. The tactics used during the early Medieval era by visiting monks involved both a systematic rebranding of vernacular traditions as "magic," while also introducing Christian counterparts to have greater effectiveness and moral soundness. This included an introduction of negative language to describe local beliefs and practices, as well as positive depictions of comparable, Christian beliefs by visiting missionaries and in oral tradition. In looking at the written accounts of Christian monks, stories of exalted Christian heroes, and both the Christian and pre-Christian Nordic traditions themselves, as well as notable academic interpretations of this information, I propose that there was a clear employment of a steady rhetorical presence to successfully change Scandinavian perceptions of folk traditions. I will first lay the basis upon which the understanding of "magic," "belief," and "practice" operate, as well as how they functioned in Nordic culture. Once established, I will discuss the shift in terminology used to describe the local traditions as opposed to the Christian ones. With a strong linguistic basis, my argument will turn to the appearance of language in notable epics and works of oral and, later on, written tradition. In doing so, I argue that the Christian missionaries saw such success in conversion due to their reformulation of the relationship between Nordic and Christian beliefs and practices.

Tricksters of Japan: *Kitsune* and *Tanuki* in the Japanese Folk Tradition

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Since the first attempts to collect and record Japanese oral folktales in the 19th century, the mysterious fox (*kitsune*) and the shape-shifting raccoon-dog (*tanuki*) have both been prominent and reoccurring characters in Japanese folklore. Since entering Japan from China in the 4th-7th centuries CE, these supernatural animals have permeated the country's traditions, folk beliefs, and cultural practices. In the modern world, they have transformed into central and

easily-recognized symbols of Japanese cultural identity. Discussing the character archetypes of these shape-shifting figures, this paper will present a history of the cultural practices and beliefs surrounding these creatures, illustrate their appearance in Japanese literature, and show their adaptation into modern popular culture. Specifically, it will offer a cultural analysis of folk stories from the medieval classics *Konjaku Monogatari* and *Genji Monogatari*, as well as other sources of oral Japanese folklore that extend into the modern period. This paper argues that the *kitsune* and *tanuki* became such central figures to Japanese folk belief that over time, after Japan was opened to western influence, the two characters transformed into an expression of Japanese cultural identity itself.

Sociology and Anthropology

Society and the Evolution of Media Coverage of School Shootings

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The occurrence of school shootings in the United States, although rare, generates widespread public concern. Public views of school shootings are reflected in and created by narratives of the events depicted in the media. Investigating media framing of school shootings can contribute to the understanding of media's role in constructing contemporary social problems and potentially generating a moral panic. Specifically, examining changes in narratives over time reveals shifting societal views on school violence. This research addresses several questions regarding media narratives of school shootings. First, how has the media narrative concerning the coverage of these events evolved over time? For instance, does recent media coverage use epidemic language more often than earlier coverage? Second, to what extent does media coverage contain elements of moral entrepreneurship that may lead to a moral panic? Answering these questions uniquely contributes to research on media narratives of mass violence by examining coverage of a large number of school shootings over an extended period of time while prior studies generally focus on a small number of high profile cases over a shorter time frame. I addressed this literature gap by conducting both qualitative and quantitative content analysis of more than 180 televised segments and print media articles from 1989 to 2015. Results show that, in 2004-2008, the collective focus of the stories shifted from the perpetrator, following a *damaged perpetrator* frame, to the victims, following a *collective mourning* frame. Moreover, the use of epidemic phrases continuously decreased until 2014 as media expressed a *resignation* frame of school violence. These results will be discussed in the context of the development of the cultural narrative of school shootings and public perception.

Investigating Market Activity at the Ancient Maya Site of Dos Hombres

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Finding evidence of an ancient Maya marketplace is difficult due to the high perishability of telltale materials such as food, textiles, and wooden stalls in the tropical environment of Belize. Therefore, using both material culture and additional archaeological methods to elucidate market activity is necessary, such as stratigraphy, soil chemistry, and spatial analysis. The site of Dos Hombres is a medium sized civic center located in the Rio Bravo Embayment in Northern

Belize, and is thought to have played an important political, economic, and religious role in the area. Using Bruce Dahlin's (2007) research on Maya markets in the Yucatan as a general framework, the existence of a market at Dos Hombres was tested through analysis of landscape features, systematic excavation, and phosphorus testing of soils. In a 20 by 20 meter area adjacent to the largest and most publicly accessible part of the site, Plaza A, six 1 X 1 meter units were excavated at five meter intervals. Stratigraphic analysis revealed a shallow clay matrix that evened the ancient activity surface over bedrock and the very high density of ceramic sherds, lithic debitage, obsidian flakes, faunal items, and tools above that layer of clay. The present data suggest that there was a heavy presence of decomposed organic materials as represented in soil chemistry, heavy foot traffic indicated by trampling of ceramics, high quantities of small lithic flakes related to frequent re-sharpening of tools for producing items for market sale in market stalls, and finally, material culture indicators of items traded into the site, such as marine shell. These multiple lines of evidence indicate a very strong correlation with the hypothesis, such that this spatially distinct area did in fact serve as a locus of market activity at the ancient site.

Depression, Anxiety and Suicidality of College Students – A Leadership Prize Project

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Addressing the mental health concerns of college students, including depression, anxiety and suicidality, must be critical in a college or university's mission to protect the well-being of their student body. However, broad initiatives to improve the mental health of this population can inadvertently neglect the specific needs of students with different identities in terms of gender, class year, area of study, housing locations, or affiliation with on-campus groups like Greek life or athletics. Based on review of relevant scholarship, a survey was designed and will be implemented to students at a private university in the southeastern United States. Participants will be asked to indicate demographic information as well as complete measures of depressive and anxious symptomatology, alcohol consumption, hopelessness, perceived social support, and additional items related to their perceptions of mental health and use of campus services. Following the quantitative survey study, focus groups investigating trends found in the survey will be conducted to discover systemic challenges student populations face that adversely affect their mental health. It is expected that results from this study will provide information on the prevalence and severity of specific mental health concerns of different student populations at the university and comparable institutions. This study is significant because it has been designed to address specific risk variables relevant to college students, such as alcohol use, campus housing, and feelings of exclusion. Results may be used to contribute to the development of targeted solutions for student groups and improve the effectiveness of college and university attempts to foster positive mental health environments for their students.

Incorporation of Contemplative Practices in Higher Education: Faculty Perspectives

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

During higher education, students have the opportunity for immense growth and exposure to new ideas. This period can also be accompanied by great stress and distractions that can impede learning in the classroom. University faculty play an important role in impacting the

student experience through both their interpersonal interactions with students and pedagogical approaches. Contemplative pedagogy, strategies that focus on mindful awareness and embrace students holistically, may enhance the student experience. Focus groups were conducted with nine university faculty and staff members at a small southeastern university to better understand their views on incorporating contemplative practices into their classrooms. A wide range of disciplines were represented including physics, human services, business law, psychology, sociology, and philosophy. Participants were asked about their opinions on contemplative practices overall and if they had any personal or previous experiences with the practices. The questions posed were generated from previous scholarship on contemplative pedagogy. From these questions and follow up discussion with faculty and staff participants, key themes were identified regarding how to best incorporate these practices into the classroom setting.

Participants identified and endorsed many benefits of using contemplative practices in university classrooms, including the improvement of relationships with students, decreased mindlessness, decreased burnout, and overall positive impacts on student learning. Participants also described obstacles to inclusion of contemplative practices such as disciplinary considerations, student receptiveness, time of day considerations, and the availability of student's personal technology (i.e. phones, computers) as a distraction. Despite some limitations, this study provides insights for the implementation of contemplative practices in university classrooms. In summary, from the faculty perspective, students are most likely to be receptive towards these practices if the practices are tied to disciplinary content, and technology is not offered as an alternative to participation. In future research, understanding faculty perspectives across a wider range of universities may help establish trends and insights into integrating practices within the greater domain of higher education.

Family Choices and Autism: An Examination of How Raising a Child with Autism Spectrum Disorder Impacts Family Completion

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How does having a child with autism spectrum disorder (ASD) influence the family system and considerations about family size? Previous research suggests that raising a child with ASD involves distinct challenges and growth opportunities. Parents of autistic children must contend with negative stereotypes that exist about autism and cope with the effects of these stigmas on their families. The objective of this study is to explore how having a child with ASD influences parental decision-making around family completion, the process of deciding that no additional children will be added to a family. Based on review of previous literature, it was expected that having a child with ASD could contribute to a family's decision to complete their family. These topics were addressed by analyzing the data of a sub-sample of five participants in a larger research study about family choices, which required participants to consider their families to be complete. Participants in this sub-sample included four females and one male that met the study criteria and also had a child that they described as having ASD. Semi-structured quantitative interviews included both general questions as well as more specific questions about parenting a child with ASD. Results of these case studies indicate that parents of a child with ASD experience social stigmas, yet may feel an enhanced sense of self as a result of raising a child with ASD. Parents reported that having a child with ASD had a significant impact on their families' lives and for some, influenced their determination that their family was complete.

Several themes emerged as salient with respect to autism and family development: high levels of resiliency, frequent encounters with discrimination, and feelings of fulfillment. These results have implications for understanding the experience of parenting a child with ASD and how that experience might impact family expansion.

Newcomers and Nursing: Infant Feeding Beliefs and Practices of Recently Resettled Refugees

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It is recommended by the World Health Organization that infants receive only human milk until six months of age and breastfeeding continue along with appropriate foods until the child is two years of age or older. Risk factors for low breastfeeding initiation and early weaning in the United States include socioeconomic status, race, education level, geographic region, and immigration status, including resettled refugees. The limited available academic literature suggests that rates of breastfeeding among resettled refugees are particularly low. Breastfeeding is important for long-term health outcomes for mothers and babies, therefore this paper argues that the infant feeding practices of resettled refugees should be more closely observed. The purpose of this study was to explore the infant feeding practices of refugee families living in Guilford County, North Carolina. Fifteen newly resettled mothers of young children from Bhutan, Sudan, South Sudan, and the Democratic Republic of the Congo participated in focus groups and individual telephone interviews. Interviews examined the participants' experiences accessing medical services and raising children in North Carolina. Interpreters assisted me in interviewing participants with limited English language skills. Participants were recruited from April-October 2017 using snowballing technique and convenience sampling. Thematic analysis revealed eight themes, including cultural beliefs for child care, necessity of social learning, influence of the recommendations of healthcare professionals on infant feeding decisions, barriers to accessing transportation, challenges accessing language services, maternal employment status, significance of culturally and nutritionally appropriate food, and impact of social support. The results suggest a need for policymakers and healthcare professionals to take into account social, cultural, environmental, and historical influences to improve the delivery of health care services for newcomer mothers and children. Recommended interventions to increasing breastfeeding rates among resettled refugees include cultural humility training for healthcare professionals, improved access to language services for newcomers, and community building that includes the entire family structure.

Quality education in Far Western Nepal: Seeking Equal Access in a Politicized, Patriarchal Society

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Until the beginning of the 1950s, Ranas, Nepal's feudal rulers, limited access to education to privileged members of the upper caste and the wealthier economic strata while the majority of the population remained illiterate. Even after the revolution of 1951 that ended the Rana rule, limited efforts were made to establish system of universal education in Nepal. Although Nepal's constitution is in transition, formal education has technically been guaranteed to all, in reality

access to quality education has been unequally and unfairly districted. The purpose of the exploratory ethnographic research, on which this paper is based, conducted in the summer of 2017, was to understand the causes of disparities in access and quality education in the district of Humla, Nepal's most isolated and least developed district. UNESCO reports that the literacy rate in Humla is 47%, making it one of the least literate districts in Nepal. Enrolment in basic education (grades 1-8) for girls is 81% and 84% for boys, but enrollment in secondary education (9-10) is only 42% for girls and 54% for boys. For this study data was collected using fieldwork observations, focus groups, semi-structured interviews as well as educational policy analysis. Perspectives from students, parents, teachers, the Ministry of Education, other Nepali administrators, politicians, and NGOs were included in this study. This preliminary research points to these factors as the primary causes of limited access to and quality of education in the region: a human labor-dependent agricultural economy, politicization of education, corruption within the education system, patriarchal culture, geographical isolation, the caste system, and stereotypical views toward disabled people.

Understanding Deception: An Exploration of Inauthenticity as a Form of Deceptive Communication

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Lies have been a part of human interaction since the beginning of language. The innovation of language gave humans the means to form lies; therefore, language in itself encourages and promotes the practice of deception (Smith, 2004). Scholars from across the disciplines of sociology, anthropology, psychology and other fields have sought to identify types of deception; however, recent scholarly approaches have expanded to consider non-verbal forms of deception. This research project involves an evaluation of existing scholarship on deception to assess whether being inauthentic or disingenuous with others is a form of deceptive communication. This research draws on Goffman's (1959) notion of impression management, in which individuals alter their appearances and manners in order to present themselves in a particular way. A historical approach is used to trace the evolution of key social psychological concepts from their roots to contemporary applications. Based on this historical review, we propose that behavior can be inauthentic and deceptive and that these topics can be examined through three complementary perspectives. The first perspective looks at the circumstances and motives behind why one may engage in inauthentic behavior and deception. The second examines the consequences of inauthenticity as a form of deceptive communication through an analysis of impacts on the self and others. Finally, the third perspective challenges the conventional view that all deceptive communication is damaging and suggests that inauthenticity can be a strategic and potentially prosocial form of deceptive communication through the preservation of relationships, self-esteem, jobs and morality. This research is significant because it bridges the gap in research from different disciplines on the complexities of deception and incorporates the concept of inauthenticity into existing approaches to understanding deception.

Sport Management

Sport Teams as Sustainable Assets in Our Communities: Proenvironmental (Green) Initiatives in North American Professional Sport Leagues

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Adopting sustainable and environmentally-friendly business practices in the spectator sport industry has gained popularity in response to positive changes among sport fans in their respective communities (Kellison & Kim, 2014). Particularly, North American sport organizations at professional levels are playing an increasingly important role in amplifying awareness of the environmental impact of everyday life (Babiak & Trendafilova, 2011). For example, Major League Baseball and its member clubs observe 'Earth Day' (April 22nd) to contribute to the well-being of their respective communities with sustainable initiatives, from collecting recyclables to planting trees to offering green promotions/giveaways. This current phenomena drives the following research question: why do professional sport organizations implement and adapt sustainable and environmentally-friendly design initiatives? Therefore, the purpose of this study is to bring relevant research and content analysis together to formulate a conceptual model that illustrates the major drivers and outcomes of North American professional sport teams' green initiatives. The proposed conceptual framework articulates three main areas: drivers, initiatives, and outcomes. Three key drivers are identified to motivate sport managers to adopt green initiatives; goodwill, normative standards and market pressures (McCullough & Cunningham, 2010; Trendafilova, Babiak, & Heinze, 2013). Secondly, as a result of these drivers, professional sport organizations actively implement and adapt green initiatives. Finally, the expected outcomes from the green initiatives not only build enduring personal resources (i.e., environmental awareness and pro-environmental behavior; Kellison & Kim, 2014) but also strengthen social resources (i.e., community attachment and pride; McCullough & Kellison, 2016). In conclusion, the body of knowledge generated through this applied research provides the following implications: (a) to shed light on the important role and function of professional sport organizations' green movement in society; (b) to allow sport managers to better identify a variety of green initiatives employed by professional sport organizations and (c) to encourage more organizations to accelerate green movement toward socially and environmentally healthier communities.

Characteristics of the Division I Athletic Director

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The role of Athletic Director (AD) is a highly complex, critical university position, having pressures to generate revenue, maintain media and alumni relationships, and provide a well-rounded student-athlete experience. Despite its importance, however, the role is not particularly well understood, in particular understanding the ADs' career path. This research aims to gain a comprehensive understanding of the job of the 2017 Division I AD, focusing specifically on career backgrounds. This phase of the study examined descriptive data and the career path trends of the 351 current Division I ADs. Data from this study were added to an ongoing dataset used to examine characteristics of the Division I AD (gender, years as AD, past job experiences) over time (since 2009). Based on data gathered from media guides and institutional websites, descriptive analyses were conducted to identify trends in ADs' career paths and examine profile differences among the levels of Division I membership (i.e., FBS, FCS, HBCU, and Division I Non-football). Results from this study will begin to elucidate the characteristics of an average Division I AD and allow comparison to changes over time. Findings from the 2017 dataset

indicated that the majority of current Division I ADs were hired into their roles from outside the institution's athletic department. In addition, 40% were senior level athletic administrators, and almost 30% had been ADs at other Division I institutions prior to their current position as AD. In comparison to the 2009 data, these results are all increasing trends. Findings from this study will serve as the foundation for the next phase of an ongoing project, which will examine differences among division status and years as athletic director across divisions. A further examination will identify career path trends of the Division I athletic director. For instance, data will be examined to determine whether schools in varying divisions tend to promote from within or hire from other institutions or outside the industry. Higher education administrators can use the data to understand trends in hiring, and enhance training and professional development programs for this increasingly important executive position.

CAA Basketball Analytics: Performance Indicators of Winning

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In recent years, basketball has become more analytics oriented with many experts striving to find indicators of team performance. To the best of our knowledge, past studies have focused on descriptive statistical measures of performance, however only few studies have built a data model of advanced metrics to predict key team performance. In both professional and college basketball, the success of a program is always heavily influenced by the team's on court performance. We can measure the success of a basketball team based on how many wins the team has. The purpose of the study is to explore what performance metrics are the best indicators of a winning basketball team. Using the Colonial Athletic Association team and player data for the past three years, this study explores team averages for a variety of indicators and evaluates their relationship to team wins. The data of ten teams and three years will be consolidated and cleaned, prepared for analysis, and explored visually using SAP dashboard. Following that, multiple regression analysis will explore the relationship among variety of traditional and advanced factors such as average points per game, player efficiency rating, offensive and defensive rating, points produced, and value over replacement player. The results will help us understand how we can evaluate players and teams using advanced statistics and provide us with key indicators important to form a winning basketball team.

World Languages and Cultures

A Search for Their Own Pleasure: Female Characters in Short Stories of Marina Mayoral and Esther Tusquets

Tiffany S. Anderson (Dr. Mayte de Lama) Department of World Languages and Cultures

Literary works produced by female writers during the years of Spain's dictatorship were characterized by governmentally imposed strategic restrictions, such as censorship of media and literature. Because of this, narratives would present female characters in ways that exemplified both political and societal views of what it was to be a woman. Women characters lacked depth and complexity and instead were depicted as delicate, maternal, subservient, and weak, among other characteristics. The political shift of 1975, from dictatorship to democracy, unleashed

endless possibilities in content and themes now available for female authors of the current generation and generations to come. Marina Mayoral and Esther Tusquets are such writers whose literary works have challenged the portrayal of women, from a traditional to a non-traditional role, through the introduction of themes and behaviors that were previously prohibited. The present study analyzes the short stories "En los parques, al anochecer", and "La belleza del ébano" by Marina Mayoral as well as "Las sutiles leyes de la simetría" by Esther Tusquets. The aim of this study is to reveal how these authors' techniques of role reversal, sexual encounters, and desire facilitate the protagonists' pursuit of pleasure, and in doing so construct a new perception of womanhood. Ultimately, the findings of this study conclude that each protagonist successfully discovers that which brings her pleasure through breaking predisposed gender norms designated by society. In addition, in seeking their own pleasure the protagonists promote the ability of women to take control of their lives in a way they had never done before.

The Desire for Female Independence in Laforet's *Nada* Under Francisco Franco's Spanish Dictatorship

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The Spanish novel *Nada*, written by Carmen Laforet, tells the story of an adolescent girl named Andrea who moves to Barcelona in the 1940's. The novel depicts the initial years of the Spanish dictatorship that were some of the toughest for the people of Spain and are often described as years of hunger, fear, and censorship. During the first part of the novel, Andrea arrives to Barcelona and experiences the limited freedom and the patriarchal views and restrictions of her family, which negatively impact how she views herself and her gender. However, as the story continues Andrea begins to neglect these views and aspires for a better life in the future. In my research I explore the personalities and actions of her extended family and how they relate to the restrictions that the dictatorship in Spain imposed on women. It is important to note that during this time period women were taught to take care of the household, to be obedient to their spouse, and to be seen only in relation to men and their children. However, unlike other women of this time, Andrea overcomes the constraints of her gender role and seeks independence not only from her household, but also from the patriarchal Spanish society. Andrea's journey to find independence represents the desire of other Spanish women that longed for independence and liberty in a controlled Spain. Her story and the obstacles she overcame served as a source of inspiration to other Spanish women of this time who also wanted emancipation and a life outside the binaries of Spanish society.

Gods, Myths, and Men: Analyzing Conceptions of Divine in Seneca the Younger's Philosophical and Tragic Works

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Scholars have long noticed the seeming discrepancy between Seneca's philosophical conception of the divine and the conventional presentation of the gods in his tragedies. In this paper I suggest that Seneca's tragic depictions of the gods served an important purpose, namely to develop his moral philosophical messages within a mythological tradition that is more familiar to the common, uneducated Roman and thus easier to grasp. I begin by providing an overview of

how the divine is depicted in Seneca's philosophical and tragic works. Specifically, for his philosophy, I examine *De Providentia* for its focus on divinities and their roles in mortal lives. *De Ira* and *De Clementia* are likewise significant for the way they respond to moral questions that are often raised by mythological tales. In contrast, *Hercules Furens*, *Phaedra*, and *Trojan Women* present conventional tales of the gods and goddesses engaging in morally dubious activities such as deception and revenge; these representations offer an important counterpoint to Senecan philosophy. Next, following the work of Miriam Griffin, who argues that Seneca's *Moral Letters* is a dynamic work that shows the growth of the addressee as the moral concepts become more complex, I argue that in his letters, Seneca employs a dynamic pedagogical approach to teach his philosophy to the beginner philosopher, Lucilius. This approach involves introducing the beginner to philosophical lessons using forms and subjects more familiar, and then gradually increasing their complexity as the student's understanding grows. I conclude by suggesting that Seneca employs the same pedagogical style in his tragedies. The tragedies represent the first step in the process employed in the *Letters* as his likely audience, the common people, is not one that Seneca will engage with beyond the tragic performance. The conventional divine tradition provides a more palatable environment for Seneca to teach his more complex philosophical lessons to the common people. Mythology allows Seneca to use well known mythological characters, such as beloved Hercules and angry Juno, to teach moral Stoic lessons. In so doing, Seneca makes accessible to a lay audience the same lessons that he delivers with greater sophistication in his philosophical works.

Intimate Partner Violence and Abuser Tactics in Dulce Chacón's *Algún amor que no mate* and Icíar Bollain's *Te doy mis ojos*

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The dictatorship led by Francisco Franco, which lasted almost forty years in Spain, reinforced an overtly sexist society which relegated women to an unfavorable legal status and a strictly limited role in the ideal family. With the fall of the dictatorship in 1975 and subsequent transition into democracy, Spanish women have made great strides in a variety of social sectors: legislation and politics, economics, education, civil rights, etc. Although there has been a great deal of societal reform as well, the unequal mindset of Spanish *machismo* has clearly persisted through those legislative changes, especially within the home. Intimate partner violence (a subset of domestic violence) remains a prevalent issue in Spanish society, as evidenced in statistical data, literature and art. Both Dulce Chacón's novel, *Algún amor que no mate* (1996) and Icíar Bollain's film, *Te doy mis ojos* (2003) expose the issue of domestic violence and offer insights on certain tactics employed by the abusive spouses in order to garner power. This study attempts to further the understanding of the following manipulative tactics used by the abusers in these texts: the domination of economic provisions, the elimination of her personal interests that do not relate to him and, lastly, the total destruction of her self-confidence. With these actions the abuser intends to garner both power and dependence, all the while reinforcing traditional gender roles. Considering that gender violence as a categorization is a relatively new concept to academia, this multi-lateral approach allows us to go beyond the statistics and into the psychological mechanisms of the abuser. The clandestine nature of intimate partner violence creates an imperative for studies of this nature, in order to help both victims and the general public recognize and intervene during situations of abuse.

Fear and Detrimental Memories in *Magallanes* (Peru, 2015)

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The Peruvian film *Magallanes*, directed by Salvador del Solar, makes an important commentary on the still prevalent consequences of the violence and terror that Peru experienced during the 1980s and 1990s due to the Internal Armed Conflict between the country's government and a communist militant group known as the Shining Path. Throughout the film, an indigenous woman named Celina tries to deal with the trauma of being kidnapped and raped during the conflict. This trauma is heightened when she unknowingly befriends Harvey Magallanes, a former soldier who served under Colonel Rivero, the man who held Celina hostage and sexually abused her when she was a teenager. When Magallanes finds Celina, the memories from her trauma make it impossible for her to move on with her life and results in her anger and volatile behavior. In this paper, I argue that Celina's struggles in *Magallanes* elucidates that it is unfair to have society force people who have suffered traumatic events to remember these experiences, if nothing will be done to help them recover from the trauma and if the government does not fulfil its promises to implement helpful social programs to redress the wrongs committed during the conflict. Like Celina, most of the victims of the conflict were indigenous who lived in the rural parts of the country. Although the Truth and Reconciliation Commission (2001-2003) investigated the human rights abuses of the conflict and made recommendations to address the underlying causes of the violence, most of them did not come to fruition. The indigenous people had to tell their stories in order to obtain attention from the government, but they had to relive their trauma and these memories can be detrimental. When the goal is helping people rebuild their lives, this agenda validates the necessity to tell the story again but, considering that very few of the Commission's recommendations were implemented, it does not seem reasonable to inflict more psychological pain. In *Magallanes*, Celina is having to live with her pain again without any compensation for the trauma she experienced.

Catalyzing A Revolution: Women in French Film

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My research explores the power of female roles in film, in the context of the progress towards the empowerment of women in France. At a time when the equality of women and men is under international speculation and women all over the world are speaking out against unjust treatment, disregard, and harassment, exploring the journey of a country's women towards a more equal society is timely. This research examines and analyzes in depth four films that contain thought-provoking portrayals of masculine-feminine relationships from both the 50s and 70s. The presentation will examine the various ways in which the female characters embody something daring in comparison to the status quo woman's role in society in those times. It will focus on powerful women who redefine what it means to be a woman in France at their point in history. The presentation will begin with a brief history of feminism in France, and then examine the progress points of that journey at the moments when these films were emerging for the public. The female characters in the films analyzed are a fascinating voice in the conversation about developing women's equality with men in French society. The artistic work of these actresses

forwarded France's progress towards equality in a unique and powerful way by portraying women in roles of power and agency.

Identity Perception for Female Muslim-American College Students

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The way college students perceive and construct their identity has recently emerged as a prominent topic in higher education literature and psychology, particularly focusing on underrepresented groups. This attention to the needs of students helps to create a goal for universities to shape and foster a more welcoming environment where all students can thrive personally and academically. As Muslim-Americans have risen to the spotlight of media attention, there is a lack of research on the affects current social and political climates have on Muslim-American college students. In the aftermath of 9/11 and the US wars in Iraq and Afghanistan, Muslims have gained increased visibility in the American social and political conversation. Current political rhetoric is rather antagonistic towards Muslim with its proposed Muslim registry and travel restrictions from Muslim majority countries. By normalizing the association of Islam and terrorism, mainstream media draws upon and reinforces anxiety surrounding Muslims. This increased visibility has not come with increased knowledge about the Muslim community. Additionally, the conversation surrounding the Muslim community has been highly gendered, promoting a stereotype for Muslim men as threatening and Muslim women as oppressed. These sweeping generalizations often put Muslim-Americans in a place where a greater burden is felt to act as a spokesperson or representative of the entire community. This study aims to explore self-perception of female Muslim-American college students, and how the identity of these students shapes and influences their college experience as they navigate it as Muslim-American women. Data for this study will be collected through personal semi-structured interviews with 10 participants from area universities in North Carolina. Participation will be solicited through Muslim Student Associations of target schools. Data will then be analyzed through a constructivist lens and the theory of self-authorship. Theories of identity formation and perception will help contextualize the information from the interviews as it relates to contemporary sociological theories. In addition to submitting the paper for publication, findings will be shared with youth leaders at participating universities and local Islamic centers as a resource for their event planning and community-building activities.

Leadership In the Financial Industry: Empathy and Bilingualism

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With more organizations moving towards collaborative environments due to IT systems such as ERP and cloud computing changing the way people communicate, it is essential for managers to concentrate on skills such as empathy, learning, and adaptation (Quentin, 2018). In an increasing global workforce, empathy becomes even more important in international communication. This study looks into behaviors and characteristics that affect the tendency towards empathy of leaders working in the financial industry in addition to the possibility of a cognitive advantage that bilinguals have working in this industry. Since cognitive perspective-taking is a cognitive function that is as complex as switching between languages, my hypothesis is that bilinguals will score higher in this scale of the Interpersonal Reactivity Index (IRI) (Davis, 1980) which

measures an individual's tendency toward empathy. Through a mixed-methodology approach participants complete a 42-question survey and a 30-40 minute interview right after they finish the survey. In addition to self-identifying questions, a large portion of the survey is adapted from the IRI. It contains four scales that measure an individual's tendency towards empathy: Perspective Taking, Fantasy, Empathic Concern, and Personal Distress. Interviews look for personal situations that support the participants' answers. Results for the relationship between perspective-taking and bilingualism does not support my hypothesis. I found that, contrary to expectations, monolinguals score higher than bilinguals on every scale. However, a further examination of my data suggests an interesting, post-hoc relationship. My interview data identifies five recurring themes that relate to the behavior and working environments of all the participants. The themes are: collaboration, perspective-taking, relationship-focus, competition, and listening. Further investigation shows a consistent application of these behaviors among the 71.4 % of participants who are financial advisors. Benefits of bilingualism continue to be seen via repeated themes such as self-awareness and attention on nonverbal communication. This investigation on empathy in the financial industry contributes to a deeper understanding of its utilization and relation to bilingualism.

Finding the Middle Class in First-Century CE Rome

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The middle class in Ancient Rome has often been disregarded by earlier historians as unimportant or nonexistent. Reasons for this oversight vary from the term 'middle class' not existing in Latin texts to the concept of social class differing between the ancient and modern worlds (Mayer, 2012, pp. 8-9). In contrast to those who argue against the existence of the middle class, in this paper I make a case for the existence and the importance of the middle class in Ancient Rome by uncovering which members of society constituted this group, what their lifestyles were, and what their contributions to society in economic terms were. Through using this three-part analysis, I aim to determine what it meant to be middle class in Ancient Rome. To situate the Roman middle class within a modern understanding of economic classes, I apply to the ancient world a modern definition of middle class, defined by elements such as income, education, and occupation (Morton, 2004). Using this means of classification, I explore the middle class in the context of the economic environment that existed in first-century CE Rome. To better understand the middle class during this time period, I closely examine Petronius' *Cena Trimalchionis*, written in the late first-century CE, as a literary depiction of the middle class. This text offers its audience a unique opportunity to explore questions of class and status through its focus on a former slave who is trying to establish himself as a member of upper-class society. Despite his best efforts, however, the main character, Trimalchio, and his guests are portrayed as citizens vocationally not considered lower class but also not socially accepted as members of the upper class (Smith, 2004). Through an analysis of the characters and their positions in society — reflected by elements such as vocation, language choices, and lifestyle — I provide new insights in regards to members of Roman society in terms of our modern day understanding of class. By developing this awareness of the middle class, we can better understand the economic, social, and cultural norms of Roman people who have been overlooked in the past.

The Failure of Assimilation and the Effects of Colonialism on the Experience of Migrants in France

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In the last few years, amid unprecedented flows of migrants and refugees as well as horrific terrorist attacks, dissonance between native French populations and immigrants seems to have reached a peak. What, if any, are the barriers to migrant and refugee integration into French society? Has the traditional French model of assimilation failed? What does it mean to be French? Using scholarly journals, film and case studies, this paper aims to analyze French colonial and imperial history in the region, barriers of assimilation, and longstanding tensions between immigrant populations and French society. Since the French colonization of parts of Northern Africa and the Middle East in the 19th and 20th centuries, tensions between the colonizer and the colonized have been palpable. Nowhere is this hostility more evident than in the case of Algeria, which will be used as a case study. Three main causes will be examined in the context of France's integration policy. The influence of Islam, the impact of France's colonial empire in the Maghreb, and racism all play a part in the barrier to migrants' integration into French society. As a result of these factors, the colonial French policy of assimilation has failed to create a unified national identity and instead has resulted in cultural conflict, discrimination, and the mistreatment of migrants and refugees landing on French shores.