

Spring Undergraduate Research Forum

Welcome to SURF 2017

**The 24th 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 includes 219 presentations by 247 undergraduate students. The SURF abstracts were reviewed by two Elon faculty with disciplinary expertise.

SURF is an integral part of **CELEBRATE** – a weeklong series of events that brings to light our students' wonderful academic and creative pursuits.

We invite you to join and support the student presenters and performers as they share the joy of exploration and discovery that are the hallmarks of an intellectual community.

UNDERGRADUATE RESEARCH PROGRAM ADVISORY COMMITTEE

Dr. Eric Hall	Dr. Kyle Altmann
Dr. Paula Rosinski	Dr. Jessica Wery
Dr. Tonmoy Islam	Dr. Rebecca Pope-Ruark
Dr. Ryan Kirk	Dr. Kristina Meinking
Dr. Barbara Miller	Dr. David Vandermast
Dr. Lynn Huber	Dr. Chad Awtrey
Prof. Joel Hollingsworth	Dr. Qian Xu
Prof. Bill Webb	Dr. Meredith Allison (Associate Director)
	Dr. Paul Miller (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>Session I</u> (10:30am-12:10pm)	11		
McKinnon D	11	Moseley 215	12
McKinnon E	11	Isabella Cannon Room	13
McKinnon F	11	Global Commons 103	13
Lakeside 212	11	Yeager Recital Hall	13
Lakeside 213	12	Inman 112	14
Lakeside 214	12		
<u>Session II</u> (1pm – 2:40pm)	15		
McKinnon D	15	Moseley 215	17
McKinnon E	15	Isabella Cannon Room	17
McKinnon F	15	Global Commons 103	17
Lakeside 212	16	Yeager Recital Hall	18
Lakeside 213	16	Inman 112	18
Lakeside 214	16		
<u>Session III</u> (2:50pm – 4:30pm)	19		
McKinnon D	19	Moseley 215	20
McKinnon E	19	Isabella Cannon Room	21
McKinnon F	19	Global Commons 103	21
Lakeside 212	19	Inman 112	21
Lakeside 213	20		
Lakeside 214	20		
<u>Poster Session II</u> (4:10pm-5:30pm)	7		

ABSTRACTS BY DEPARTMENT			
<u>Accounting</u>	22	<u>Internat./Global Studies</u>	87
<u>Art</u>	23	<u>Management/Entrepren.</u>	90
<u>Biology</u>	25	<u>Marketing/Internat. Business</u>	91
<u>Carret Essay Winners</u>	34	<u>Mathematics/Statistics</u>	95
<u>Chemistry</u>	36	<u>Music</u>	98
<u>Communications</u>	40	<u>Performing Arts</u>	100
<u>Computing Sciences</u>	47	<u>Philosophy</u>	102
<u>Economics</u>	48	<u>Physical Therapy Education</u>	103
<u>Education</u>	51	<u>Physics</u>	104
<u>Engineering</u>	53	<u>Pol. Science/Policy Studies</u>	106
<u>English</u>	55	<u>Psychology</u>	110
<u>Environmental Studies</u>	58	<u>Public Health Studies</u>	124
<u>Exercise Science</u>	63	<u>Religious Studies</u>	132
<u>Finance</u>	78	<u>Sociology/Anthropology</u>	137
<u>History</u>	79	<u>Sport/Event Management</u>	142
<u>Human Service Studies</u>	83	<u>World Languages/Cultures</u>	144

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

The Great Hall, Global Commons

Poster #	
S1	Anna Darnowsky Dr. Muriel Vernon Paternal Perspectives: Understanding Fathers' Experience With Alternative Birth
S2	Bea C. Balajonda & Lauren A. Miller Dr. Jen Hamel Potential Effects of Habitat and Host Plant Use on Opportunity for Hybridization Between Two Insect Species
S3	Chloe Chambon Dr. Lawrence Garber Foreign Market Entry: Adaptation and Partnerships as a Successful Strategy for Foreign Food Business
S4	Caitlin Niven Dr. Scott Wolter & Dr. Christopher Arena Use of Irreversible Electroporation in Destruction of Helminth Eggs in Water Systems
S5	David F. Bement Dr. Eric Hall Influence of Self-Perceptions on Aggression in Sport in Collegiate Club Athletes
S6	Ian R. O'Leary Dr. Kathryn Matera Stabilization of Amyloid Beta Peptide Aggregates Using Phenolic Compounds
S7	Elizabeth M. Belanger, Kyle A. Lynch, & Maggie B. Hakas Dr. CJ Fleming How to Find Help: Student Perceptions of Sexual Assault Responses Among Peers
S8	Sarah Alger Dr. Cynthia Fair Internationally Adopted Children with PHIV: Challenges Associated with Adolescence
S9	Olivia Brazer & Sydney Solomon Dr. Srikant Vallabhajosula & Dr. Jane Freund Relationship Between Function, Quality of Life and Balance in Persons with Chronic Ankle Instability
S10	Caroline Dean Dr. Maureen Vandermaas-Peeler Parents' Beliefs about Young Children's Outdoor and Nature Experiences in Danish and U.S. Contexts
S11	Olivia R. Jung & Ashley Wenz Dr. Christopher Arena Phase Change Electrode for Non Thermal Tumor Ablation
S12	Lauren A. Brown Dr. Caroline Ketcham, Dr. Eric Hall, & Dr. Srikant Vallabhajosula Effect of Dual-Task and Neurocognitive Function on Turning Characteristics Among Collegiate Athletes
S13	Lindsey M. Bauer & Kendall M. Soracin Dr. Wally Bixby Effect of Meditation on Endurance Performance
S14	Kiley Shannon Dr. Chad Awtrey Symmetries of Degree 8 Polynomials
S15	Hailey R. Fleishman & Alexandra S. Buchanan Dr. Maureen Vandermaas-Peeler The Effects of Risky Play in Nature on Preschoolers' Social Engagement
S16	Josephine Gardner Dr. Mussa Idris Improving Aid Effectiveness to Africa: A Culturally Informed, Skills-Based Non-

	Governmental Organization to Empower Low-Income Women in Addis Ababa, Ethiopia	
S17	Samantha Lubliner "What Do You Even Do with That Major?": Influences in the Sociology Major Declaration Process	Dr. Rena Zito
S18	Alexis de Groot Injured Student-Athletes' Perception of Social Support	Dr. Tony Weaver
S19	Nicholas F. Rhyne The Differences Between Native & Non-native Wages in the US Agriculture Sector	Dr. Brandon Sheridan
S20	Jonas R. Black, Jared T. Melanson, & Simon C. Locke Affect Responses to an Acute Bout of Resistance Exercise the Morning after Consuming a Nighttime Protein Supplement	Dr. Titch Madzima, Dr. Eric Hall, & Svetlana Nepocatych
S21	Andrew J. Scarlata Player Development: Education at Major League Baseball Academies in the Dominican Republic	Dr. Mark Cryan
S22	Sara Majercak Virtual Incivility: The Democratic Consequences of "Rude" Politicians on Twitter	Dr. Jason Husser
S23	Clare L. Shaffer, Aislinn M. Gherman, Kalen M. Koch, Madeline L. Mahla, & Dominic E. Willoughby Frontal Cortical Asymmetry: Electrophysiological Markers of Social Stress Regulation	Dr. Rachel Force
S24	Warren A. Grunvald Assessing Morphological Traits and Evidence for <i>in situ</i> Hybridization of Two Closely Related Insect Species	Dr. Jen Hamel
S25	John B. Gallagher & Daniel J. Lynch Sport-Related Strobe Glasses Training for Visual Speed and Processing Enhancement	Dr. Caroline Ketcham & Dr. Eric Hall
S26	Sarah Holdren Narratives of NEC: The Impact of NICU Feeding Practices on Parent Decision-Making	Dr. Aunchalee Palmquist
S27	Emily H. Harrison & Caroline D. Deaterly Comparison Of Absolute Gait Parameters Between Breast Cancer Survivors And Healthy Controls During Forward And Backward Walking	Dr. Titch Madzima & Dr. Srikant Vallabhajosula
S28	Kayla Pieri A Magnetic Carrier for Targeted Delivery of Lipophilic Pharmaceuticals	Dr. Ben Evans
S29	Jayna Concannon & Megan Herdt Comparing the Experiential Differences of First-Generation and Low-Income College Students to Continuing-Generation and High-Income College Students	Dr. Katie King
S30	Cameron Jackson The Natural Hair Journey: Social Media Communities and the Promotion of Natural Hair Acceptance among Black, Female College Students	Dr. Vanessa Bravo
S31	Jared T. Melanson, Jonas R. Black, & Simon C. Locke The Effect of Nighttime Eating on Morning Resting Energy Expenditure, Satiety, and Resistance Exercise Volume	Dr. Svetlana Nepocatych & Dr. Titch Madzima

S32	Théo Hardy The Rise of the Craft Beer Industry in the United States: Can this Industry Also Thrive in France?	Dr. Robert Moorman
S33	Madeline L. Mahla, Kalen M. Koch, Clare L. Shaffer, Aislinn M. Gherman, & Olivia M. Brand Attention Bias Modification Training on Impulsivity and Alcohol Consumption	Dr. Rachel Force
S34	Mary Alice Allnutt Structural Analysis of Neurotransmitter-stabilized Amyloid-beta Oligomers	Dr. Kathryn Matera
S35	Josselyn J. Geyer Effects of an Undergraduate Teaching Assistant Position on Pedagogical Mathematical Knowledge	Dr. Aaron Trocki
S36	Grace E. Bennett Comparing Potency of Cucurbitacins B, E, and I in Acute T-Cell Leukemic Cells	Dr. Tonya Train
S37	Kelsey H. Barthold Seniority and Patterns of Legislative Production	Dr. Carrie Eaves
S38	Jackie Grant Young Protagonists and the Coming-of-Age Story	Prof. Tita Ramirez
S39	Bernadette Cooper & Rachel Cockrell Identifying Effective Role Model Strategies For Black Women in STEM Careers	Dr. India Johnson

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

Poster #	
S1	Emma Lavandosky & Ellen Montgomery Dr. Eric Bauer Vibrational Effects on Snail Withdrawal
S2	Duncan Hay Dr. Ben Evans Microscopic Force Probes for Measuring Mechanical Strains in Phagocytosis
S3	Mary C. Sheehan Dr. Daniel Burns "For Whom is the Funhouse Fun?" : The Influence of John Barth's "Lost in the Funhouse" on David Foster Wallace's "Westward the Course of Empire Takes its Way"
S4	Jeanine J. Grabowski & Briana N. O'Grady Dr. Eric Hall, Dr. Caroline Ketcham, & Dr. Srikant Vallabhajosula Gait Characteristics in Collegiate Student-Athletes after Sustaining a Concussion
S5	Emily B. Seligman Dr. Judy Esposito Filial Therapy with Fathers in Supervised Visitation
S6	Carlos A. Andino Dr. Elisha Savchak-Trogdon Is Social Media Changing the Way We Understand Judicial Campaigns? An Exploratory Study into Modern Judicial Candidate Methods
S7	Morgan D. B. Maner Dr. Muriel Vernon The Learning Circle Project: Cultural Transformation in Dementia Care
S8	Aislinn M. Gherman, Clare L. Shaffer, Kalen M. Koch, & Madeline L. Mahla Dr. Rachel Force Boost Your Own Brain: tCDS, Brain, and Spirit Education Lessening the Interpretation of Social Evaluative Threat
S9	Nicholas A. Hadgis Dr. Matthew Wittstein Impact of Low Stride Time Variability on Running Performance
S10	Colleen O. Fitzpatrick Dr. Mina Garcia-Soomally Politician or Poet? An Analysis of the Literature and Politics of Juan Emilio Bosch Gaviño
S11	Joelle M. Halle Dr. Byung Lee An Analysis of Hillary Clinton-Sponsored Advertisements During the 2016 Presidential Election
S12	Daniel J. Lynch & John B. Gallagher Dr. Caroline Ketcham & Dr. Eric Hall Association of ACL Injury In Student-Athletes With Concussion History
S13	Jenna Rose Dafgek Dr. Yuko Miyamoto Exploring the Effect of Rapamycin on T Cell Proliferation and Survival
S14	Brendan T. Kearney Dr. Jen Dabrowski Development of an Efficient Route of Sorbitan Synthesis from Simple Sugars Using BCF Activation of Allyltrimethylsilane
S15	Hannah Silvers Dr. Rebecca Pope-Ruark Ethos of an Editor: Rhetorical Practice and Learning of Student Newspaper Copy Editors

S16	Caroline D. Deaterly & Emily H. Harrison Resting Energy Expenditure, Body Composition, Phase Angle, Muscular Strength, Dietary Intake and Physical Activity in Breast Cancer Survivors and Healthy Aged Matched Controls	Dr. Titch Madzima
S17	Alexa Trost An Analysis of Mental Health Help-Seeking Behaviors and Perceptions of Students in Transition from High School to College	Dr. Bud Warner
S18	Sophie Parker Youth & Resilience: Evaluation of a Narrative-Based Community Intervention	Dr. Alexis Franzese
S19	Lauren E. Westerberg Influences of Inquiry-Based Guidance Instruction on Parental Support of Children's Mathematical and Science Reasoning at Home	Dr. Maureen Vandermaas-Peeler
S20	Matthew R. Peery Evaluation of Antibodies to Detect Cytoskeletal Proteins and Lysing Conditions in Jurkat T Cells Treated with Rapamycin	Dr. Yuko Miyamoto
S21	Emily Swanson Self-Assembly of Monolayers on Graphene with Pyrene and Cyclodextrin Derivatives	Dr. Dan Wright
S22	Stephen Feely Analysis of Nutrient Uptake by Genus Cuscuta	Dr. Brant Touchette
S23	Maggie B. Hakas, Kyle A. Lynch, & Elizabeth M. Belanger Help Me, Help You: A Study of Undergraduate Help-seeking Behavior in Response to Unwanted Sexual Experiences	Dr. CJ Fleming
S24	Lauren K. Salig Suenas como un gringo: El efecto de la amenaza del estereotipo en la competencia escrita de los estudiantes de español en Elon	Dr. Mina Garcia-Soomally & Dr. Elena Schoonmaker-Gates
S25	Amanda M. Shoenfelt Analysis of Interventions Implemented in the Classroom for Individuals with Emotional Disturbances and a Difficulty with Interpersonal Relationship Problems	Dr. Jessica Wery
S26	Brighton E. Summers Influence of Sleep, Symptoms and Neurocognition on Visual Performance and Number of Concussions in Collegiate Student-Athletes	Dr. Caroline Ketcham & Dr. Eric Hall
S27	Valeria Rizzi, Meghan Peterson, & Tanner Pinheiro Chemotaxonomy of Sourwood and Poplar Honey	Dr. Eugene Grimley & Dr. Karl Sienerth
S28	Cassidy Levy Correlates of Dung Beetle Introduction to Australia	Dr. Amanda Chunco
S29	Bridget Smith The Intersection of Strategic Interests and Morality: Post-9/11 US Foreign Policy and the Use of Torture in Uzbekistan	Dr. Sean Giovanello
S30	Jacqueline T. DeRosa, Kayla E. McGraw, Mark A. Rowley Jr., & Breanna N. Warren The Age-Related Associative Memory Deficit can be Modified by Manner of Presentation: The Role of Reduced Cognitive Load	Dr. Amy Overman

S31	Melody Titus Investigating Standards Based Grading in a Math I Classroom	Dr. Aaron Trocki
S32	Zachary Gianelle Dissolution, Dismemberment, and the Queer Dionysian: On Literary Representations of Dionysus and the Bacchic Rites	Dr. Lynn Huber
S33	Patricia J. Sorrentino & Meagan H. Richardson Weight Control and Dieting Practices among College Women	Dr. Titch Madzima & Dr. Svetlana Nepocatych
S34	Matthew C. Laing Using Dynamic Light Scattering to Determine the Mechanism of Periodic Precipitation (Liesegang) Reactions	Dr. Joel Karty
S35	Tyler Pellarin An Intervention Model: Using the Reappraisal Coping Strategy to Reduce Frequency of Boredom	Dr. Alexa Darby
S36	Jennifer L Faig, Rachyl E Jackson, Sydney R Lawton, Maria Hadaya, & Alice M Pittman North Carolina Global Engagement Snapsho	Dr. Haya Ajjan
S37	Amanda M. Brechbill Structural Analysis of Vanadium and Peptide Complexes	Dr. Jen Dabrowski
S38	Alex R. Brownlow & Katherine E. Pennington Effect of Foot Placement on Vertical Jump Ground Reaction Force	Dr. Joyce Davis
S39	Amanda Benjamin Alibi Believability: The Impact of Timing of Disclosure, Strength of Evidence, and Severity of Crime	Dr. Meredith Allison
S40	Caroline Bailey Setting the Stage: A Study of Preservice Teachers' Integration of Theatre Arts	Prof. Marna Winter
S41	Allison S. Russo & Emily C. Guy Difference in Single Leg Balance Comparing Flat Foot and Relevé (Plantarflexed) Positions in Collegiate Ballet Dancers	Dr. Joyce Davis
S42	Kim A. Abrams Quenching of Electrochemiluminescence in Aqueous Solution by Nitrate Explosives	Dr. Karl Sienerth
S43	Jennifer N. Gehrin The Effects of Balance Training and Resveratrol Supplementation on Stability	Dr. Paul Miller & Dr. Caroline Ketcham
S44	Emma S. Deneen, Alex P. Giglio, Ashley S. Howard, & Joanna M. Salerno The Age-Related Associative Memory Deficit Can be Modified by Manner of Presentation: The Role of Encoding-Retrieval Congruency	Dr. Amy Overman
S45	Micalah A. Collins What We Believe Becomes Who We Are: An Exploration of Race, Ethnicity, and Nationality Among Elon Students	Dr. Mussa Idris
S46	Matthew R. Jegier Innovating Returns: Incentive Alignment and Acquirer Innovation in Mergers/Acquisitions	Dr. Todd Stonitsch

S47	Grace Godsy Quantifying E. coli Bacterial Cells Using ezAFM	Dr. Krithika Venkataramani
S48	Bryce A. Krzenski Vestibular Deficits in Concussions: Relationships between Concussion Mechanism and Neurocognitive Performance	Dr. Caroline Ketcham & Dr. Eric Hall
S49	Kalen Koch, Madeline Mahla, Aislinn Gherman, Clare Shaffer, & Olivia Brand The Relationship Between Exercise, Sleep, and Impulsivity	Dr. Rachel Force
S50	Hailey Fleishman Parent Guidance in Learning Science and Math at Home	Dr. Maureen Vandermaas-Peeler

Oral Presentations Session I (10:30am-12:10pm)		
McKinnon D (<i>Moderator: Prof. Patricia Thomas-Laemont</i>)		
10:30 am	Mollie Flowers An Examination of the Small Mammal Community of an Old Field Habitat, with an Emphasis on the Movement Patterns of the Hispid Cotton Rat	Prof. Patricia Thomas-Laemont
10:50 am	Joseph Brian Meko Reuse of Impaired Water Through a Multitrophic Sustainable Ecological Machine	Prof. Steve Moore
11:10 am	Gisele P. Nighswander, Samantha McCabe, & Mariana Kneppers Diurnal Changes in Quantum Yield in Aquatic and Wetland Plants	Dr. Brant Touchette
McKinnon E (<i>Moderator: Mary Alice Allnutt</i>) [<i>Dr. Kathryn Matera</i>]		
10:30 am	Shelby Cuddeback The Effects of Amyloid Beta Oligomers on the Oxidation of Lipids	Dr. Kathryn Matera
10:50 am	Erica Braschi The Effect of Lactoperoxidase on DNA Mutations in the Presence of Estradiol	Dr. Kathryn Matera
11:10 am	Vanessa A. Grove Aggregation Mechanisms of Amyloid-Beta and Insulin	Dr. Kathryn Matera
McKinnon F (<i>Moderator: James Setzer</i>) [<i>Dr. Kacy Kim</i>]		
10:30 am	Gabrielle E. Corner How Complexity-Induced Construal Affects the Perception of Advertising Messages	Dr. Kacy Kim
10:50 am	Jonas Fries The Effect of Homepage Complexity on Brand Perception, Attitude and Choice: A Factorial Design	Dr. Lawrence Garber
11:10 am	Anette K. Koehler What is the Potential of Business Model Innovation in the Transportation and Logistics Industry?	Dr. Alisha Horky
11:30 am	Ramon Brandt Predictive Modeling in Higher Education Fundraising	Dr. Haya Ajjan
11:50 am	Lilian Renee Guenzel Agile Sales: An Exploration of Agile Methodologies in Sales	Dr. Erin Gillespie
Lakeside 212 (<i>Moderator: David Nunamaker</i>) [<i>Dr. Tom Mould</i>]		
10:30 am	Claudia I. Rodriguez Unseen Differences: Cultural Diversity Among Hispanic and Latino Students	Dr. Rodney Parks & Mr. Jessie Parrish
10:50 am	Nicky Kratzer	Dr. Bud Warner

	Orientation's Effect on Mental Health Among First-Year College Students	
11:10 am	Ben Bridges Navigating Globalization through Myth in Quechua Communities of Southern Peru	Dr. Tom Mould
11:30 am	Ben Bridges, Sarah Kraemer, & Oly Zayac Call of the Wild: Behind the Scenes of an Ethnographic Film	Dr. Tom Mould
Lakeside 213 (Moderator: Mike Rossi) [Dr. Michael Matthews]		
10:30 am	Andrew Bryant What is not Working in Latin America: Themes in U.S. Counter-Narcotics Policy	Dr. Damion Blake
10:50 am	Sarah E. Mulnick More than Motherhood: A Comparative Analysis of Female Suicide Terrorism in Iraq and Chechnya, 1990-2015	Dr. Laura Roselle
11:10 am	Michael D. Rossi Hassan al-Banna's War of Position: A Gramscian Analysis of the Origins of the Muslim Brotherhood in Egypt	Dr. Michael Matthews
11:30 am	Alex Vandermaas-Peeler Narrative, Memory And Identity: Storytelling In The Bosnian Diaspora In St. Louis, Missouri	Dr. Safia Swimelar
Lakeside 214 (Moderator: Megan Hernandez-Greene) [Dr. Lynn Huber]		
10:30 am	Daniela Sostaita Examining Religion's Role in Shaping Sexual Attitudes and Behaviors among U.S. Latinas	Dr. Rebecca Todd Peters
10:50 am	Filippos A. Rempoutzakos The Anime and Manga Apocalypse: End of the World Narratives in Japanese Popular Media	Dr. Lynn Huber
11:10 am	Iliana Berger Brodsky "Time is The Scroll": Poetic Expressions of Muslim and Jewish Identity in Al-Andalus	Dr. Ariela Marcus-Sells
11:30 am	Emma Flaherty & Victoria Oakley The Construction of Narrative as the Deconstruction of the Author in Dragon Age: Inquisition	Dr. Brandon Essary
11:50 am	Claire Swanson Spiritual Touching in the Warmund Sacramentary	Dr. Evan Gatti
Moseley 215 (Moderator: Dr. David Vandermast)		
Sustainability Across the Disciplines: Engaging Students in Sustainability Thinking and Learning Symposium		
10:30 am	Elizabeth M. Barker Establishment of a Piedmont Prairie by Plowing and Seeding	Dr. David Vandermast
10:50 am	Stephanie A. Bedard Exploring Millennials' Social Media Usage and Green Consumption	Dr. Carri Tolmie

11:10 am	Alaina C. Kiesel The Sweet Taste of Imperfection: A Visual Exploration of Unmarketable Produce	Prof. Samantha DiRosa
11:30 am	Emma M. Nault Figuring the Fate of <i>S. bombifrons</i> : Can Southern Populations of this Species Withstand Climate Change?	Dr. Amanda Chunco
Isabella Cannon Room (Moderator: Nick Hadgis) [Dr. Chad Awtrey]		
10:30 am	Peter L. Jakes Higher Degree Polynomials and their Solvability by Radicals	Dr. Chad Awtrey
10:50 am	Michelle A. Rave Vaccines and Bacterial Shields: Mathematical Modeling of Dengue Fever	Dr. Crista Arangala & Dr. Karen Yokley
11:10 am	Kelly A. Reagan Simulations on a Mathematical Model of Dengue Fever With a Focus on Mobility	Dr. Karen Yokley & Dr. Crista Arangala
11:30 am	Nathan Pool The Construction of Fractals of Arbitrary Dimension	Dr. Jeffrey Clark
Global Commons 103 (Moderator: Rebecca Foley) [Dr. Barbara Miller]		
10:30 am	K McKay The Negative Portrayal of Islam and Perpetuation of Islamophobic Ideas by American Media in the Twenty-First Century.	Dr. David Copeland
10:50 am	Bryan Anderson Effects of Live Tweeting on User Engagement in Premium Sporting Events	Dr. Qian Xu
11:10 am	MaryClaire Schulz Corporate social responsibility and women's entrepreneurship: The case of Coca-Cola's 5by20 initiative	Dr. Barbara Miller
11:30 am	Nicole Ackman "Wait for It": The Marketing of Broadway's New Smash Hit Hamilton and Ticket Scarcity	Prof. George Padgett
11:50 am	Skyler de Groot Made in Colombia-Drugs, War and Violence: The Framing of Colombia in The New York Times vs. Tourists' Perception	Dr. David Bockino
Yeager Recital Hall (Moderator: Sara Wasserman) [Dr. Susanne Shawyer]		
10:30 am	George Whitaker Clothing Doth Make the Man	Prof. Jack Smith
10:50 am	Killian Poplyk The Flower of the Fern: Adapting a Slavic Folktale into an Audioplay	Prof. Kevin Otos
11:10 am	Ciara M. Corcoran Elon Monologues: A Creative Exploration of Life, Culture, and Diversity	Dr. Susanne Shawyer

	at Elon University	
11:30 am	Stephanie Pittman	Prof. Lauren Kearns Dance Injury Prevention Assessments: A Series of Case Studies
Inman 112 (<i>Moderator: Francesca Music</i>) [<i>Dr. Cynthia Fair</i>]		
10:30 am	Vashti K. Shiwmgangal	Dr. Aunchalee Palmquist Influence of Parental Food Preferences on Child Feeding Practices in Households Receiving Federal Nutrition Assistance
10:50 am	Alyssa M. Crawford	Dr. Cynthia Fair The Decision Making Process of Women Who Plan Waterbirths
11:10 am	Camaya Miller	Dr. Stephanie Baker Black Women Choosing Out-of-Hospital Delivery
11:30 am	Ozelle J. Bower	Mr. Reikan "Ray" Lin Capturing the API Student Experience: A Photovoice Project at Elon University

Oral Presentations Session II (1pm-2:40pm)		
McKinnon D (Moderator: Prof. Michael Strickland)		
1:00 pm	Sam Shantry & Lindsay Seventko	Prof. Michael Strickland Glen Raven Disaster Relief Shelter: Garden Design & Logistics
1:20 pm	Laura A. Todd	Dr. Scott Morrison Exploring Sense of Place in Adolescents: A Qualitative Approach
1:40 pm	Caila L. Yates	Prof. Michael Strickland Growing Healthy Habits: Positive Effects of Community Gardens in Low-Income Housing Neighborhoods
2:00 pm	Amber K. Adams-Kuebler	Dr. Scott Morrison The Bridges and Barriers to Environmental Education on an ECO Campus
McKinnon E (Moderator: Dr. Eric Bauer)		
1:00 pm	Emma P. Davidman	Dr. Linda Niedziela Environmental Toxins and Attention Deficit Hyperactivity Disorder: Investigating the Link Between Phthalates and Hyperactive Behavior in Zebrafish
1:20 pm	Emma E. Eskeland	Dr. Jennifer Hamel Examining Two Closely Related Species for Evidence of Selection Against Hybridization
1:40 pm	James J. Henderson III	Dr. Greg Haenel Comparing Genetic Diversity in Two Lizard Species: Does Natural Selection Act on Mitochondrial DNA in Thermally Stressful Environments?
2:00 pm	Mitchel Kanter	Dr. Janet MacFall The Effect of Railroads on the Soil Microbiome
2:20 pm	Madi Kennard	Dr. Eric Bauer The Effect of E-Cigarettes on Zebrafish Behavior
McKinnon F (Moderator: Amanda Feldman) [Dr. Steve DeLoach]		
1:00 pm	Justin Bellinger	Dr. Steve DeLoach The Impact of Mental Health on Wages
1:20 pm	Justin Morin	Dr. Katy Rouse The Relationship Between Income and the Hospitalization Rates of Ambulatory Care Sensitive Conditions
1:40 pm	Catherine Ann Ray	Dr. Steve DeLoach Wage Discrimination in Germany Between Turkish Immigrants and German Natives: An Empirical Analysis of Labor Market Outcomes of Turkish Immigrants
2:00 pm	Andrew Van Hoof	Dr. Katy Rouse Effects of Adolescent Physical Education on Future Obesity Outcome
2:20 pm	Holly A. Brueggman	Dr. Jennifer Platania

	Examining the Impacts of Debt on First-Time Home Buyers	
Lakeside 212 (Moderator: Kayla McGraw) [Dr. Amy Overman]		
1:00 pm	Zoe P. Ross-Nash The Correlation Between Anorexia and Perfectionism in College Age Women	Dr. Bilal Ghandour
1:20 pm	Taylor N. Obzud Transphobia in Sex-Integrated Versus Sex-Segregated Settings	Dr. David Buck
1:40 pm	Mary F. Bernhardt Self-Generation and Corrective Feedback in Memory for Context	Dr. Amy Overman
2:00 pm	Anne J. Phelan & Kimberly A. Brown Linguistic Framing Effects on Charitable Donations	Dr. L. Kimberly Epting
2:20 pm	Lauren K. Salig Rarely Say Never: College Students' Perceptions of Persuasive Writing and Essentialist Language	Dr. L. Kimberly Epting
Lakeside 213 (Moderator: Jensen Colins) [Dr. Rena Zito]		
1:00 pm	Josephine Hungerbuhler Migrant-Friendly Hospitals: The Current State of Practice, Barriers, and Facilitators to Migrant-Friendly Care in Europe	Dr. Katherine Johnson
1:20 pm	Emily A. Dzilenski Crossing the Border: A Study on the Framing of Global Migration by National News Media	Dr. Glenn Scott
1:40 pm	Julia Ohanyan Educating Global Citizens: A Comparative Case Study Regarding American and Moroccan University Students and Their Global Knowledge, Awareness, and Perceptions	Dr. Brian Digre
2:00 pm	Colleen Fitzpatrick A Cross-National Analysis of Women's Political Power and Norms Supporting Gendered Violence	Dr. Rena Zito
2:20 pm	Sophia Angst Machismo and Language: A Comparative Study of Gendered Linguistics and Gender Relations in Society	Dr. Elena Schoonmaker-Gates
Lakeside 214 (Moderator: Grace Landsberg) [Dr. Stephen Bloch-Schulman]		
1:00 pm	Mary A. Park Building Environmental Empathy through the Language of Poetry	Dr. Cassie Kircher
1:20 pm	Charles M. Hawes IV "Once More unto the Breach, (Again)": An In-Depth Analysis of the Representation of Conflict in Film Adaptations of Shakespeare's Henry V	Dr. Megan Isaac
1:40 pm	Anna Richards Gothic Feminism: From Literature to Slasher Movies	Dr. Scott Proudfit
2:00 pm	Alonzo Cee & Mary Frances Foster	Dr. Stephen Bloch-Schulman

	Whose World is This?: Troubling Whose Stories are Welcomed into the Academy by Bringing Rap into the Classroom	
2:20 pm	Becca Nipper	Dr. Stephen Bloch-Schulman A Leadership Prize Project: Mentorship as A Means of Female Empowerment: A Resolution to Lessen Gender Inequality on College Campuses
Moseley 215 (Moderator: Surya Shahi) [Dr. Brian Pennington]		
From the Field: Religion, Development, and Public Policy in South Asia Symposium		
1:00 pm	Brianna Birchett	Dr. Brian Pennington The South Indian "Wife of God" after Criminalization: Patriarchy, Liberalism, and Devadasis
	Justin Brown	Dr. Amy Allocco A Third Gender: Examining Authority, Legitimacy, and Modernity in India's Hijra Community
	Emily McHugh	Dr. Amy Allocco India's Endangered Parsis: Population Policy and State Secularism in Comparative Perspective
	Leena Dahal	Dr. Mussa Idris "Let's Do Something, Saathi": The Role of Social Media in Shaping Youth Agency in Post-Disaster Nepal
	Anya E. Fredsell	Dr. Amy Allocco Constructing and Performing Authority in Yoga Traditions: An Ethnographic Approach
	Audrey A. Griffith	Dr. Amy Allocco Intersections: Women's Resistance in Law, Religion, and Activism in Contemporary South India
Isabella Cannon Room (Moderator: Dr. Joyce Davis)		
1:00 pm	Nicole B. Doolen	Dr. Walter Bixby Regulating Pleasure during Exercise: Impact on Exercise Adherence
1:20 pm	Kristen A. Fontela	Dr. Walter Bixby Comparison of the Effects of Self-Selected and Prescribed Intensity Exercise on Exertion and Feeling
1:40 pm	Ashley King	Dr. Joyce Davis Relationship Among Chronic Knee Injury, Leg Dominance, and Lower Body Kinematics of the Saut de Chat
Global Commons 103 (Moderator: Diego Pineda Davila) [Prof. Janna Anderson]		
1:00 pm	Molly E. Bauer	Dr. Amanda Sturgill Equity through Technology: Mobile Friendliness, Usability and Accessibility for School Websites
1:20 pm	Anna M. Zwingelberg & Maya D. Eaglin	Prof. Janna Anderson

	Global Internet Leaders Identify Issues Crucial to Achieving United Nations 2030 Sustainable Development Goals	
1:40 pm	Anna M. Zwingelberg	Dr. Derek Lackaff Perceiving the Black Box: Understanding Trust in Algorithms
2:00 pm	Heather Deiner	Dr. Amanda Sturgill Je Suis Slactiviste?: Sending Support Across Borders Through Profile Photo Change on Social Media
2:20 pm	Zachary Evan Bocian	Prof. Youssef Osman FACEMASK: A Study of Transyouth & Football
Yeager Recital Hall (Moderator: Prof. Clay Stevenson)		
1:00 pm	Bethany Beckham	Dr. Victoria Fischer Faw The Evolution of Gender Portrayal in Italian Opera: The Castrati and Opera Seria in the Eighteenth Century
1:20 pm	Anders N. Borg	Dr. Todd Coleman A Producer's Stamp: Exploring the Role in Creating an Album
1:40 pm	Isaac J. Bates	Prof. Clay Stevenson Evolution of The American Music Festival
Inman 112 (Moderator: Sofia Huster) [Dr. Katherine Johnson]		
1:00 pm	Lauren C. Byrne, Natalie Mayer, & Matthew Crumpton	Dr. Cynthia Fair The Role of Peers In The Participation of Obese Adolescents in Family-Systems Treatment
1:20 pm	Bethany V. Lake	Dr. Katherine Johnson Migrant Health Experience In Almance County: Provider And Patient Perspectives On Innovation In Community-Based Health Care
1:40 pm	Michelle H. Reissig	Dr. Cynthia Fair "I've been fearful for the labor part": The Influence of Previously Heard Birth Stories on the Birth Experiences of Primiparous African-American Women
2:00 pm	Anna Rice	Dr. Aunchalee Palmquist Food Management Practices and Household Food Decisions Amongst Individuals Receiving Federal Nutrition Assistance
2:20 pm	Nosipho Shangase	Dr. Cynthia Fair Assessing Pregnancy Prevention and Vocational Needs of South African Adolescents and Young Adults: A Community-Based Participatory Approach

Oral Presentations Session III (2:50pm-4:30pm)

McKinnon D (*Moderator: Michaela Fogarty*) [*Dr. Catherine Chiang*]

2:50 pm	Jake Jimenez Finding Fraud: Financial Ratio Analysis as a Fraud Detection Tool	Dr. Catherine Chiang
3:10 pm	Nicholas C. Massey State Taxation of Electronic Commerce	Dr. Susan Anderson
3:30 pm	Katherine A. Korol Fraud Auditing in the Era of Big Data	Dr. Catherine Chiang
3:50 pm	Charles S. May Determining the Endorsement Value of Professional Golfers	Dr. Kate Upton

McKinnon E (*Moderator: Lucas Hale*) [*Dr. Dave Gammon*]

2:50 pm	Reagan Monteith Who Copies Who? Northern Mockingbird Vocal Mimicry	Dr. Dave Gammon
3:10 pm	Dawson W. Nance Examining the Effects of Parasitism on Female Mate Choice and Copulation Duration	Dr. Jennifer Hamel
3:30 pm	Madeline L. Rector The Effect of Carbaryl on the Protein Reelin in the Brains of Zebrafish Larvae	Dr. Linda Niedziela
3:50 pm	Gabrielle E. Resh Do Mockingbirds Normally Copy their Mimetic Song Directly from Model Species, or from Other Mockingbirds?	Dr. Dave Gammon
4:10 pm	Sarra Eddahiri Medicinal and Food Plant Use of Montagnard Communities in Greensboro, North Carolina	Dr. Catherine Bush

McKinnon F (*Moderator: Sean Webber*) [*Dr. Tonmoy Islam*]

2:50 pm	Danielle M. Brown Shifting Regional Wealth and the Market for Latin American Art	Dr. Steve DeLoach
3:10 pm	Kenneth Crew Congestion Makes it Harder to Breathe: Do High Occupancy Toll Lanes Reduce Emissions?	Dr. Tonmoy Islam
3:30 pm	Lauren C. Fisher Cosmos within the Landscape: Sacrifice and Cenotes in the Ancient Maya Cities of Chichén Itzá and Mayapán	Prof. Khristin Landry-Montes

Lakeside 212 (*Moderator: Cora Abdoo*) [*Dr. Michael Carignan*]

2:50 pm	C. Chase Davis "Our Strong Fortress": The Resiliency of Agriculture in the Post-Civil War Virginia Tobacco Belt	Dr. Charles Irons
3:10 pm	Daniel J. Weiss Religion at Theresienstadt: Jewish Identity in Holocaust Survivors' Testimonies and Autobiographical Accounts	Dr. Andrea Sinn

3:30 pm	Kelly E. Swaim How September 11 Influenced the Portrayal of the Middle East, Islam, and Middle Eastern Peoples in College Survey American History Textbooks	Dr. Peter Felten
3:50 pm	Nicole Ackman Convents and Salons: Bourgeois Female Education and the Salonnières in 18th Century France	Dr. Michael Carignan
4:10 pm	Gabriela R. Alvarez The Malignant Betrayer vs. The Mom: Media Portrayals of Gender in the Aldrich Ames Spy Case	Dr. Peter Felten
Lakeside 213 (Moderator: James Burnham) [[Dr. Jason Kirk]		
2:50 pm	Jack M. Doyle Die Muslime in der deutschen Außenpolitik: How Integration of Ethnic Turks Affects Germany's Foreign Relations with Turkey	Dr. Scott Windham
3:10 pm	Ann L. Glynn Autonomous Regions of China; History, Effectiveness and Possible Solutions to Tibetan Autonomous Region	Prof. Xiaolin Duan
3:30 pm	Benjamin Lutz Stability in the Midst of Chaos: The Determinants of Jordan's Refugee Policies, 2012-2016	Dr. Jason Kirk
3:50 pm	Bridget Smith Torture in Times of Terror: State-Sponsored Torture in Nigeria During the Boko Haram Insurgency	Dr. Safia Swimelar
Lakeside 214 (Moderator: Dr. Olivia Choplin)		
2:50 pm	Ally Bolton Geographies of Memory and Forgetting in Agnant's <i>Le Livre d'Emma</i>	Dr. Olivia Choplin
3:10 pm	Jordan Serotte Don du Sang et les Droits des Homosexuels en France et au Maroc	Dr. Sophie Adamson
3:30 pm	Janat Bashir Denunciations and Defenses of the Burkini: The Controversy that Reveals Hypocrisy in French Secularism	Dr. Sophie Adamson
Moseley 215 (Moderator: Dr. Samuele Pardini)		
Carret Essay Winners		
2:50 pm	Annaliese Jaffe "This American Carnage:" Donald Trump, Thomas Jefferson, and the Rise of Anti-Intellectualism in the United States	1 st place
	Gregory Fulcher Exceptionalism and the Modern American Consciousness: Comparing the Inaugural Addresses of Thomas Jefferson and Donald Trump	2 nd place
	Julia Guilfoyle Fear, Disunity, Discord and Reunifying A Divided Nation: America and the World's Reception of Thomas Jefferson and	3 rd place

	Donald Trump's First Inaugural Addresses	
Isabella Cannon Room (<i>Moderator: Ian Heaton</i>) [<i>Dr. Eric Hall</i>]		
2:50 pm	Caroline E. Kruse Exercise and Resilience: Does Exercise Influence How We Handle, Bounce Back From, and Adapt to Stress?	Dr. Walter Bixby
3:10 pm	Carrie Melson The Effects of Whey vs. Soy Protein at Breakfast on Appetite Profile, Energy Metabolism and Subsequent Energy Intake	Dr. Titch Madzima & Dr. Svetlana Nepocatych
3:30 pm	Briana N. O'Grady & Jeanine J. Grabowski Concussion Recovery: Gait Characteristics in Collegiate Student-Athletes	Dr. Caroline Ketcham, Dr. Eric Hall, & Dr. Srikant Vallabhajosula
Global Commons 103 (<i>Moderator: Henry Davis</i>) [<i>Dr. Chris Richardson</i>]		
2:50 pm	Christopher R. Greene Investigating the Emission Spectra of Narrow Line Seyferts and Low-Ionization Nuclear Emission Region Galaxies through CLOUDY Simulations	Dr. Chris Richardson
3:10 pm	Beth Lester Designing a Smart Walker for Older Adults	Dr. Scott Wolter
3:30 pm	Alexis Goslen Analyzing Body Postures and Self-Injurious Behaviors Using a Kinect	Dr. Shannon Duvall
Inman 112 (<i>Moderator: Dr. Beth Warner</i>)		
2:50 pm	Jennifer Y. Fukunaga Bridging the Gap: Facilitating Connections between College Students and Their Local Campus Community	Dr. Bud Warner
3:10 pm	Kara Gustaveson Simple Volunteers or Dignified Workers? : Women's Roles in the War on Poverty and Community Action Programs	Dr. Beth Warner
3:30 pm	Briana Pfeuffer Different Mirrors: Looking at Factors that Contribute to Differences in Self Esteem Across Racial Lines	Dr. Beth Warner
3:50 pm	Chloe L. Donohoe What Makes Community Gardens Successful? An Assessment of Elements and Infrastructure that Contribute to Effective Community Engagement as a means of Cultivating Collective Efficacy in Community Gardens across North Carolina	Dr. Beth Warner
SURF Reception 4:30-5:30, The Great Hall, Global Commons		

Abstracts by Department

Accounting

FINDING FRAUD: FINANCIAL RATIO ANALYSIS AS A FRAUD DETECTION TOOL

Jacob P. Jimenez (Dr. Catherine Chiang) Department of Accounting

Fraudulent financial reporting poses a major threat to the market, with annual losses costing investors and companies billions of dollars (ACFE 2016). Despite increased regulations for public firms, fraudulent financial reporting continues to increase, as companies find new ways to inflate revenues and assets, and deflate expenses and liabilities (Kaplan 2010). This has led to a substantial amount of literature focused on developing methods to detect and prevent fraudulent activity. Financial statement analysis is one such method that uses financial ratios derived from publicly available information to identify possible fraudulent activity. This method of fraud detection is appealing because of its easy application by various users. However, current literature is mixed with some studies suggesting this method has limited effectiveness (Kaminski et al. 2004, Bierstaker et al. 2006). One successful study created a model using manufacturing firms listed on the Istanbul stock exchange (Terzi 2012). The purpose of this research is to determine if an effective model can be created using publicly listed American manufacturing firms. The effectiveness of the model is determined by the detection accuracy, number of variables required, and number of false positives. This study identifies fraud firms using SEC AAERS from the years 1990-2007, as well as the SIC codes for manufacturing firms in order to limit the industry of the study. Each fraud firm is then matched with a non-fraud firm based on year, industry, and market capitalization. The accounts and ratios identified in the Terzi (2012) study were used as the initial variables for the analysis. One half of the matched pairs were then randomly selected as the test set and logistic regression analysis was used to create the model. The results of the study are useful in demonstrating that financial ratio analysis can be an effective tool in detecting fraud. Additionally, by focusing solely on manufacturing firms this research suggests that this fraud detection method may be most effective with industry specific models.

FRAUD AUDITING IN THE ERA OF BIG DATA

Katherine A. Korol (Dr. Catherine Chiang) Department of Accounting

We live in a world of Big Data, where data is generated in great volume, high velocity, and a wide variety of formats. The availability of Big Data has called for the development and use of technology to efficiently process and analyze these large volumes and varieties of data for auditing purposes. In this research, I examine the impact of Big Data on fraud auditing and study changes to fraud auditing procedures, auditing standards, and the auditors' role due to the increasing use of Big Data technology. Innovative data analytic tools are implemented to automate audit procedures that were performed manually prior to Big Data. Consequently, current standards on fraud examination and the role of the auditor in the audit process will need to be re-evaluated. Through the use of literature review, interviews, and an online survey, this study identifies specific changes that are already being implemented and anticipated future

changes in the auditing process and standards as a result of Big Data.

STATE TAXATION OF ELECTRONIC COMMERCE

Nicholas C. Massey (Dr. Susan Anderson) Department of Accounting

The purpose of this project is to determine how states can effectively collect sales tax from online transactions. Currently, authoritative legal precedent prevents states from imposing sales tax collection responsibilities on companies that do not have a “substantial connection” with the taxing state. Therefore, when a consumer makes an online purchase from a company that has strategically avoided establishing a connection with the consumer’s state of residence, the company is not required to collect and remit sales tax on that transaction. The Supreme Court acknowledged that Congress has the ultimate authority to rule on this matter, but until Congress statutorily addresses state taxation of Internet sales, states will continue to lose tax revenue. Existing literature has addressed various proposed solutions to this problem, including state “Amazon Laws,” the Streamlined Sales and Use Tax Agreement, and the Marketplace Fairness Act. Literature on this subject has identified the relevant legal and Constitutional considerations that constrain possible solutions, as well as the stakeholders that will be affected by legislation. This research begins by examining the current legal environment established by landmark court cases. To determine which solution promises to best resolve the conflict, this research evaluated proposed solutions on two criteria: (1) the solution’s conformity to existing statutes and legal precedent, and (2) its efficacy to enable states to collect sales tax revenue from online sales. Adam Smith’s standards of a good tax were also used when evaluating proposed solutions, as they are a commonly employed tool when determining the appropriateness and quality of a tax. This research determined that the best solution is Congressional legislation that imposes sales tax collection requirements on all online companies for each state in which a company’s sales revenue exceeds a fixed percentage of the company’s total sales revenue in a given year.

Art

COSMOS WITHIN THE LANDSCAPE: SACRIFICE AND CENOTES IN THE ANCIENT MAYA CITIES OF CHICHÉN ITZÁ AND MAYAPÁN

Lauren C. Fisher (Professor Khristin Landry-Montes) Department of Art & Art History

The Precolumbian Maya of the Yucatán Peninsula constructed many of their cities so that the architecture aligned specifically with the surrounding features of the natural landscape. The Terminal Classic city of Chichén Itzá (1100-1250 CE) and the Postclassic city of Mayapán (1200-1440 CE) boast principal temples at each site dedicated to the Feathered Serpent, known as K’ukulkan to the ancient Maya. Both temples were deliberately placed over large natural underground wells, called cenotes, and share important formal and iconographic similarities. Temples and cenotes played particularly central roles in directing Precolumbian Maya city planning, as is evident in the associations between the K’ukulkan temples and their cenotes at the cities of Chichén Itzá and Mayapán. Cenotes served many functions in Precolumbian Maya society, such as functioning as sources of water, places of sacrifice, and connectors to the underworld. Additionally, for the ancient Maya, temples operated as mediums of

communication, places of sacrifice, and as *axis mundi*, or “centers of the world”, that anchored the levels and directions of the Maya universe. Both the Maya living at Chichén Itzá, as well as those later at Mayapán, intentionally combined their built landscape with natural features. Such a marriage of architectural forms with the natural world suggests the Maya at both Chichén Itzá and Mayapán believed certain natural features were pregnant with powerful forces, and that linking the natural features with built architecture infused the city with these powers. This deliberate process anchored these two cities, and therefore daily Maya life, within ancient Maya cosmology. A study of this nature reflects the ingenuity of ancient Maya urban planning in the decades before European invasion. In this paper, I will suggest that there are intrinsic cosmological and geopolitical relationships between the architecture and the landscape of the K’ukulkan Temples at Chichén Itzá and Mayapán as demonstrated by the deliberate placement of the temples in the landscape near cenotes, and the role of cenotes in Maya society, religion, and civilization.

THE SWEET TASTE OF IMPERFECTION: A VISUAL EXPLORATION OF UNMARKETABLE PRODUCE

Alaina C. Kiesel (Professor Samantha DiRosa) Departments of Art and Environmental Studies

While standards of beauty for men and women are ever-changing as societal trends alter with time and place, there is an expectation of “perfection” that remains rooted in the classical ideal of Ancient Greece and Rome. These standards and expectations are not specific to humans alone, but can be seen and measured in their application in the non-human world. For example, consumers expect their food, specifically produce, to meet particular levels of perfection, of smoothness, shininess, symmetry, and freedom from blemishes. Cosmetically imperfect produce accounts for up to twenty percent of loss in a farmer’s production in a given year and includes anything from two-or-three-legged carrots and heart shaped apples, to sprouting strawberries, siamese grapes, and bruised pears. My work aims to critique the American food industry by looking at the effects of cosmetically imperfect produce on food waste, food insecurity, and the plight of the local farmer. Using photography and text I will tackle communication of these issues with a *dramedic* (*dramatic* + *comedic*) approach—creating narratives with glamour shots of the “ugly” fruits and vegetables. The work will culminate as a gallery exhibit where I hope to bring awareness to viewers who will see “ugly” produce in a more positive light and be encouraged to support local markets and businesses that campaign for these normally unmarketable fruits and vegetables.

SPIRITUAL TOUCHING IN THE WARMUND SACRAMENTARY

Claire A. Swanson (Dr. Evan Gatti) Department of Art & Art History

In medieval Italy, not everyone had the privilege of seeing and interacting with liturgical books; however, Warmundus, the Bishop of Ivrea, did. Not only was he permitted to read out of these books, he had his own books of liturgical prayers commissioned. One of these, the Sacramentary of Warmund of Ivrea (Ivrea, Biblioteca Capitolare, MS. 86), is full of prayers and images meant to guide Warmund as he led his congregation. While many scholars have written about the Sacramentary of Warmund of Ivrea, none have focused specifically on the manuscript as an

interactional object. For example, Robert Deshman (1971) used the Sacramentary to argue for political theology in the Ottonian era. Gillian Mackie (2010), in explaining the liturgy of the dying, uses the manuscript to discuss Warmund's personal preoccupation with death. Instead of focusing on the role of the manuscript as an iconographic tool used to illustrate Warmund's personal beliefs or the time's sociopolitical context, I aim to re-focus our attention on what the manuscript's material qualities, as a sacred book, can tell us. This study therefore reframes an iconographic reading to concentrate on relationships between iconography, the space it occupies, and the user. I illustrate this position specifically through a review of the Sacramentary's images of baptism, foot-washing, the torture of John, and a portrait of Warmund. Ultimately, I find the function of imagery and its composition in the Sacramentary was not simply to illustrate stories, but to create an interactional and imaginative space through which the user could come into contact with the divine. A study of this nature is best suited to a phenomenological approach--focusing on the role of touch in the manuscript. Phenomenology is the study of subjective experiences and I argue that touch is not limited to the physical act of touching, but should be extended to the ways in which the celebrant experiences images depicting touch. By approaching the imagery and overall composition in this manner, the study will ultimately provide for a new way of seeing the manuscript's images as spaces for sensorial interaction, rather than just images on a page.

Biology

POTENTIAL EFFECTS OF HABITAT AND HOST PLANT USE ON OPPORTUNITY FOR HYBRIDIZATION BETWEEN TWO INSECT SPECIES

Bea C. Balajonda & Lauren A. Miller (Dr. Jennifer Hamel) Department of Biology

Matings between individuals of different species, or hybridization, commonly occurs when closely related species that have been separated come back into contact. Recent research suggests that ecological factors such as habitat preferences can affect how frequently hybridization occurs. Two closely related insect species, *Anasa andresii* and *A. tristis*, are in secondary contact in northern Florida, mate with one another in the field, and can produce hybrid offspring under laboratory conditions. *Anasa* feed, mate, and lay eggs on two plant species (*Cucurbita pepo* and *C. moschata*). To examine how habitat and host plant use affect opportunity for hybridization, we measured insect presence, abundance, sex, life stage, host plant species, and habitat orientation (vertical or horizontal) at sites where all host plant and insect species occur in close proximity. Abundance of *A. tristis* and *A. andresii* differed according to host plant species (chi-square, $P < 0.0001$). Adult *A. tristis* were three times as abundant on *C. pepo* as on *C. moschata*, and adult *A. andresii* were twice as abundant on *C. moschata* as on *C. pepo*. These differences were consistent between sexes (males and females) and copulating pairs (chi-square, $P < 0.0001$ for males, females, and copulating pairs). In contrast, juvenile abundance on *C. pepo* vs. *C. moschata* did not differ according to insect species (chi-square, $P = 0.883$). Juveniles of both insect species were four times as abundant on *C. pepo* as on *C. moschata*, suggesting that *A. andresii* move from *C. pepo* to *C. moschata* upon adulthood, or that female *A. andresii* move from *C. moschata* to *C. pepo* to lay eggs. We suggest that host plant and habitat use may limit hybridization between these insect species in the field, and that *Anasa* spp. represent an

experimental system for studying how ecological factors affect hybridization in nature and the laboratory.

ESTABLISHMENT OF A PIEDMONT PRAIRIE BY PLOWING AND SEEDING

Elizabeth M. Barker (Dr. David Vandermast) Department of Biology

Prairies are less common habitats in the eastern US than they once were due to fire suppression, transition to agriculture, and development. In 2014, a < 1 hectare (ha) field at Elon University's Loy Farm was plowed and seeded with 16 common and native vascular plant species in order to establish prairie habitat. Our goal was to determine the success of this method of establishing prairie plants on a former agricultural field. After disking and seeding, five 10x10 m modules were established to collect data on species richness and cover (% of the module covered by each species). In addition, soil nutrients and texture were analyzed by Brookside Labs, New Bremen, OH to determine the effect these variables have on prairie plant establishment. We identified 89 vascular plant species growing in the prairie, including all seeded species and 18 invasive species. We found a significant negative correlation between vascular plant species richness and cover ($R^2=.98$). Higher cation concentrations were associated with plots with higher cover, but not higher species richness. Soil nutrient concentrations varied across the field, particularly near plot 1 where organic matter (5.6% vs 2.6%; $p=0.005$), total exchange capacity (10.2 vs 4.4 meq/100g; $p=0.0004$), and concentrations of soil cations were significantly higher than elsewhere in the prairie. Our results indicate that plowing and seeding a former agricultural field can result in the establishment of the seeded species. However, we also found that increased nutrient availability, especially in the form of cations, results in high cover values but does not increase species richness. Additionally, ongoing management of the field is necessary to limit invasion of non-native species.

COMPARING POTENCY OF CUCURBITACINS B, E, AND I IN ACUTE T-CELL LEUKEMIC CELLS

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

Acute T-cell Leukemia (ATL) is a very aggressive, fast growing cancer of white blood cells for which new drug treatments are necessary. According to CDC, nearly 23,500 people die from leukemia per year in the United States alone. Current chemotherapeutic treatments for ATL can have harmful side effects that are detrimental to both physical health and the life quality of the patient. Therefore, new drug treatments are still necessary. A possible plant derived compound for ATL treatment is cucurbitacin, which originates from the plant family *cucurbitaceae*. There are many different types of cucurbitacins that differ by variations in their chemical structures. Preliminary results in the Train lab have shown cucurbitacin B to be a potent inducer of apoptosis (programmed cell death). However, apoptosis induced by cucurbitacins I and E have yet to be studied in relation to ATL or Jurkat cells. This study uses the human Jurkat cell line of ATL in order to compare the apoptotic effects of cucurbitacin B, E, and I. Jurkat cells were treated with 2.5 μ M cucurbitacin B, E, or I for 5 hours and were tested against a control consisting of Jurkat cells without cucurbitacin treatment. Annexin-V and PI binding used in tandem with flow cytometry produced results that indicated the percentage of Jurkat cells in

different apoptotic stages after treatment with cucurbitacin. Jurkat treated with cucurbitacin I induced the highest percentage (12.76 %) of apoptosis after 5 hours vs. no treatment (1.49%) as compared to cucurbitacin B (5.52%) and E (9.58%). All differences were significantly different as determined by Tukey Kramer and ANOVA ($p < 0.05$). These results confirmed cucurbitacin B to be an inducer of apoptosis in the Jurkat cell line, but cucurbitacins I and E had more potent effects.

EXPLORING THE EFFECT OF RAPAMYCIN ON T CELL PROLIFERATION AND SURVIVAL

Jenna R. Dafgek (Dr. Yuko Miyamoto) Department of Biology

Rapamycin is an immunosuppressive drug currently being investigated to treat multiple diseases due to its inhibition of mammalian target of rapamycin complex 1 (mTORC1). mTORC1 is known to control several aspects of cell growth and homeostasis. The effect of rapamycin on T cells is of interest due to the central role T cells play in cell-mediated immunity. Rapamycin dependent inhibition of mTORC1 causes G1 arrest in the cell cycle. However, it is not well understood why this arrest occurs or the effect of treating cells with the drug past 48 hours *in vitro*. In this study, human T cells were treated with 20 nM of rapamycin and analyzed at 1, 2, 3, and 7 days. Following drug treatment, cell viability was assayed with trypan blue staining. Rapamycin treated T cells exhibited decreased cell viability over the course of three days when compared to control cells, dropping an average of 3.5% viability over 72 hours. Cell viability was higher for cells treated with rapamycin initially when compared with cells treated with rapamycin after a 24 hour serum starvation, suggesting a potential protective effect of rapamycin on T cells. Further studies will need to evaluate some of the key proteins that are involved in regulating the cell viability or cell cycle.

ENVIRONMENTAL TOXINS AND ATTENTION DEFICIT HYPERACTIVITY DISORDER: INVESTIGATING THE LINK BETWEEN PHTHALATES AND HYPERACTIVE BEHAVIOR IN ZEBRAFISH

Emma P. Davidman (Dr. Linda Niedziela) Department of Biology

The increased prevalence of Attention Deficit Hyperactivity Disorder, or ADHD, has been linked to environmental factors, including the group of chemical plasticizers known as phthalates. Phthalates are the most common chemical in polyvinyl chloride plastic and are found in many everyday products such as food packaging, vinyl flooring and adhesives. The most common phthalate, di-(2-ethylhexyl)-phthalate, or DEHP, has been significantly correlated with the presence of ADHD in children. However, little is known about how the chemical group and disorder are related. The aim of this study was to assess the behavioral impacts of DEHP on a zebrafish (*Danio rerio*) model, with the intent of studying the induction of hyperactive behavior. Zebrafish are a well-established model organism for use in neurotoxicology and are appropriate for evaluating behaviors at various stages of development. Behavioral assays were conducted to determine the impacts of DEHP on larval zebrafish and to determine the developmental stage when these impacts occur. Fertilized eggs were exposed to 0, 0.02, 0.2 and 2.0 ug/ml DEHP beginning at 4 hours post fertilization (hpf) and then assessed using a tail touch test at 27 hpf and vibration startle test at 96 hpf. Ten fish per treatment group were tested. While the tail touch results were not statistically different between control and treated fish, the vibration startle test, which takes place at a later time in development, exhibited a statistically significant trend with increasing concentrations of

DEHP inducing increasing hyperactive behavior. Future research will use additional behavioral assays at even later developmental stages to further analyze potential relationships.

MEDICINAL AND FOOD PLANT USE OF MONTAGNARD COMMUNITIES IN GREENSBORO, NORTH CAROLINA

Sarra Eddahiri (Dr. Catherine Bush) Department of Biology

Montagnard community members began arriving in Greensboro, North Carolina from Vietnam as refugees in the early 1980's after the end of the Vietnam War. The collection of diverse Montagnard tribes are considered to be the indigenous people of the Central Highlands of Vietnam. From June 3 – September 24, 2016, 15 semi-structured interviews of Montagnard community members (12 complete interviews, 3 partial; 12 females, 3 males) living in Greensboro were conducted regarding the medicinal and food uses of certain plants. In addition, plant samples were collected from the interviewees' gardens, and will be permanently stored at Elon University. From September – December, 2016, the 63 plant samples were identified using botanical literature. Our study identified 41 species from 22 plant families. Fourteen plant families were each represented by a single species. Of the 41 species, 12 were indicated for medicinal purposes, most of which were similar to uses known from other indigenous cultures in Asia. There were, however, several novel uses or preparations of plants that were unique and/or had never been tested in the scientific literature. An additional 30 participants will be added to this study over the next two years, and on-going bacterial inhibition growth assays will be performed on selected plants used by Montagnard community members to test their efficacy at treating certain microbial infections.

EXAMINING TWO CLOSELY RELATED INSECT SPECIES FOR EVIDENCE OF SELECTION AGAINST HYBRIDIZATION

Emma E. Eskeland (Dr. Jennifer Hamel) Department of Biology

In nature, individuals can sometimes be observed hybridizing, or mating with individuals of different species. Such matings are especially common when species that were geographically isolated from one another for a period of time come back into contact. Hybridization is often costly, especially for females who typically invest more resources into offspring production than do males. Because hybridization is often costly, we expect selection for females to avoid mating with males who are not of their own species. Here, we looked for evidence of selection against hybridization between two closely related species of insect (*Anasa tristis* and *A. andresii*) that occur together in some locations, but not others, and that have been observed mating together where they co-occur. In a laboratory environment, we compared receptivity toward male *A. andresii* by female *A. tristis* from two populations: one where selection against hybridization has had a chance to occur, and one where it has not (Florida and North Carolina, respectively). We found no evidence that female *A. tristis* from either population are less likely to mate with male *A. andresii* than with male *A. tristis* (Contingency table analysis, $P = 0.22$), and no evidence that male *A. andresii* expend more effort than male *A. tristis* to achieve mating with females from either population (Kruskal-Wallis test, $P = 0.23$). However, matings between males and females of the same species are significantly longer than matings between males and females of different

species (Welch's ANOVA, $P = 0.02$). We suggest that reproductive costs associated with hybridization may not be significant compared to overall potential benefits that females are receiving from mating.

ASSESSING MORPHOLOGICAL TRAITS FOR EVIDENCE OF *IN SITU* HYBRIDIZATION BETWEEN TWO CLOSELY RELATED INSECT SPECIES

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The movement of harmful pests and invasive species is a significant issue in the globalized world. One result of adding new species to an ecosystem can be hybridization, or mating between individuals of different species. We conducted a field survey to search for evidence of *in situ* offspring resulting from hybridization between two closely related species of insects, *Anasa tristis* and *A. andresii*, that came into secondary contact in North Florida ~ 40 years ago. Preliminary work shows that hybridization between these two species can result in offspring under laboratory conditions, and that hybrids differ from both parental species by a combination of discrete morphological traits. To evaluate whether hybrids are occurring in the field, we searched three locations in Alachua County where both species have been previously documented. We collected over 800 individuals, of which 328 have been scored for diagnostic morphological traits. We assigned specimens to species according to presence/absence of small horns near the antennae, presence/absence of a white line on the scutellum, and antennal tip color. We identified 265 individuals as *A. andresii*, 62 individuals as *A. tristis*, and described 1 specimen with traits that differ from both parental species, but also from lab-reared hybrids. In addition to scoring discrete traits, we found that body sizes differed between *A. tristis* and *A. andresii* (males, two-sample t-test: 28.36, d.f. = 191, $P < 0.0001$; females, two-sample t-test: 21.99, d.f. = 125, $P < 0.0001$). Our findings are consistent with those of a laboratory experiment: very few hybrids survived to adulthood under laboratory conditions. We suggest it is unlikely that hybrid offspring survive until adulthood in the field, and that two diagnostic characteristics described by previous taxonomic work are consistent within species.

COMPARING GENETIC DIVERSITY IN TWO LIZARD SPECIES: DOES NATURAL SELECTION ACT ON MITOCHONDRIAL DNA IN THERMALLY STRESSFUL ENVIRONMENTS?

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The Long-tailed Brush Lizard (*Urosaurus graciosus*) predominantly lives in southern California and western Arizona. The mountains to the west and the patterns of rainfall in the region lead the western part of the desert to be drier and hotter than that to the east. It is believed that the differing habitats may lead to a need for different metabolic rates among the lizards across these ecosystems. This study looks to identify if there is selection on mitochondrial DNA due to these environmental changes and the differing metabolic needs because mitochondria are responsible for production of energy. To do this, we will look at the rate of genetic diversity for both nuclear and mitochondrial DNA. A low rate of genetic diversity can be due to a favored allele that is selected for within the population; whilst a high rate of diversity may signify that there are multiple alleles present and that none are genetically advantageous over the others. We examined the ratio of genetic diversity (measured as F_{st}) between the mitochondrial and nuclear DNA of

populations of *U. graciosus*. The sister species, *U. ornatus*, which lives in a cooler environment, was used for comparison. A nuclear DNA library of *U. graciosus* was compiled to acquire DNA fragments for sequencing. Previously sequenced fragments of mitochondrial DNA were used. By comparing the mitochondrial to nuclear DNA diversity, we will be able to determine if a selective sweep is present. At this time, 10 individuals of *U. graciosus* representing eight populations have been sequenced using a primer set developed in this study. Using this same primer set, seven individuals of *U. ornatus* representing five populations have also been sequenced. This study will be ready for the genetic diversity test when 20 individuals from each species have been sequenced. These individuals are broken down into five groups of four, each group representing a different population of its respective species. The current results indicate that a selective sweep is likely present in *U. graciosus*. This would indicate that natural selection can work on mitochondria due to differing metabolic/thermal needs.

THE EFFECTS OF RAILROADS ON THE SOIL MICROBIOME

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Assessing the environmental impact of railroads in NC is important because the railroad industry is revitalizing in populated areas. There is a concern that railroads may pollute soil by releasing heavy metals from cargo and engine leakage, preservatives on ties, and exhaust emissions, interfering with soil microbes and their function in biogeochemical cycling. In NC, a total of 53 soil samples were collected near railroad tracks. These include both test samples, collected within 5 meters from the train tracks, and control samples, located in the general vicinity of the test samples, but at least 10 meters away from the train tracks. Along an abandoned track in Norlina, NC, 7 test and 3 control samples were collected. Along a Norfolk Southern track with 10 - 15 trains per day between Greensboro and Durham, 15 test samples and 15 control samples were collected. Finally, along a CSX track with 40 - 50 trains per day in eastern NC between Rocky Mount and Smithfield, 8 test samples and 5 control samples were collected. A Vaisala CO₂ probe measured CO₂ concentrations to indicate soil respiration activity, and enzyme tests for acid phosphatase and β - galactosidase measured soil microbial activity. An x-ray fluorescence spectrometer was used to measure soil heavy metal concentrations. Currently, data from soil organic carbon tests are being analyzed, but two-way ANOVA tests conducted so far indicate the following. Soil closer to active railroad tracks was less microbially active compared to most control soil. However, soil along the medium trafficked line was the least microbially active. There was high variation in microbial activity along the abandoned railroad track. Finally, soil closer to railroad tracks generally had higher concentrations of heavy metals, particularly chromium and lead compared to control samples. High concentrations of metals were found along the abandoned railroad track. However, elevated concentrations of heavy metals are not necessarily linked to reduced soil microbial activity, particularly for the abandoned track, which exhibited high microbial activity.

THE EFFECT OF E-CIGARETTES ON ZEBRAFISH BEHAVIOR

Madeline A. Kennard (Dr. Eric Bauer) Department of Biology

Human beings are exposed to a large number of chemicals that have not been tested for safety. While drugs are well researched, other chemicals we are exposed to may be a safety risk because

many toxic chemicals in society are being replaced with minimally researched, potentially toxic chemicals. For example, electronic cigarettes claim to be a healthier option for cigarette smokers, and while the e-cigarettes lack known carcinogens like tar, there is little research on the toxicity of the new chemicals in e-cigarettes. This research aims to quantify the behavioral effects of 1,2 propanediol, ethylene glycol, and nicotine (the most common components of e-cigarette fluid) on zebrafish in order to begin to determine any potential neurological problems they could be causing in humans. Nicotine will act as a positive control since previous studies have shown nicotine to produce specific changes in the behavior of adult zebrafish such as anxiousness before and after treatment of these chemicals. Each chemical will be applied separately to separate fish and each chemical will be tested at several concentrations, with untreated fish as negative controls. Fish will be exposed to each chemical by immersion for 8 hours. Behavior assays of each fish will be conducted in a separate tank before exposure, immediately after exposure, and at a longer post-exposure interval of 7 days. From the videos of each testing period, the following zebrafish swimming patterns were observed and quantified using a semi-autonomous tracking program: total swum distance, time spent in target regions of the tank, and number of crossings from one region to another. As of this writing, only data for nicotine exists. Preliminary data shows that nicotine-treated zebrafish had decreased swimming distance and decreased amount of midline crossings. Ongoing research will include the two additional compounds as well as assessing any persistent behavioral effects of the chemicals 7 days following exposure. If there is any changes in behavior to the propanediol and ethylene glycol, then further research will need to be done to examine the specific neurological toxicity of these chemicals.

VIBRATIONAL EFFECTS ON SNAIL WITHDRAWAL

Emma J. Lavandosky, 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 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. Organisms use substrate vibrations for a variety of behaviors. 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 four clusters of neurons that are large (relative to the size of their bodies) and easy to access. Little is known on how terrestrial snails perceive the world beyond their chemical senses, despite the fact they are common in the environment, important elements of many ecosystems, and prominent crop pests. A behavioral assay was performed to determine the snails *Helix pomatia*'s responses to varying frequencies (12.5Hz to 200Hz) and intensities 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 and recovery time in between vibrations. Statistical analysis was performed to determine the probabilities of snails displaying a strong response or a weak response to each frequency and intensity combination. The results suggest that the probability of a snail responding to a vibration decreases with decreasing intensity of the vibration. However, the snails were not equally sensitive to all frequencies tested and showed greater sensitivity to 200Hz with decreasing sensitivity towards lower frequencies. This

behavioral sensitivity to frequencies above 100Hz by *Helix pomatia* may correlate with the vibrational frequencies produced by its predators, such as shrews, beetles, and toads.

WHO COPIES WHO? NORTHERN MOCKINGBIRD VOCAL MIMICRY

Reagan D. Monteith (Dr. Dave Gammon) Department of Biology

Vocal mimicry (copying sounds of another species) is present in 15% of songbirds. One mimic, the Northern Mockingbird (*Mimus polyglottos*), frequently mimics the songs of two model species (Northern Cardinal *Cardinalis cardinalis* and Tufted Titmouse *Baeolophus bicolor*). The purpose of this research was to determine whether mockingbirds learn cardinal and titmouse songs directly from the model or from other mockingbirds that already mimic these two species. To distinguish between these two possibilities, acoustic similarity between model and mimic versions was calculated. For both cardinal and titmouse song, 25 song recordings were made from both mimic and model species. A multivariate statistical analysis of the measured acoustic characteristics showed no consistent pattern for the cardinal comparison, but for titmouse songs the mockingbird version differed acoustically from how titmice sing. Both hypotheses could explain the titmouse result. Mimics might copy other conspecifics, but the differences might also result from physiological differences between species, or from species differences in characteristic syllable delivery patterns. Further research is required to distinguish between these possibilities.

EXAMINING THE EFFECTS OF PARASITISM ON FEMALE MATE CHOICE AND COPULATION DURATION

Dawson W. Nance (Dr. Jennifer Hamel) Department of Biology

In many species, individuals are selective about prospective mates, with preferences for traits that increase the quality or number of offspring produced. Parasitoids, or parasites that kill their hosts, may influence these mate preferences by reducing an individual's reproductive opportunity. Although interactions with parasites are ubiquitous in animal populations, little is known about how parasitoids affect mate preferences. In North Carolina, the squash bug (*Anasa tristis*) is parasitized by a fly (*Trichopoda pennipes*) that causes death within ~14 days. In the field, parasitized female squash bugs are more frequently found copulating than unparasitized females (logistic regression, $n = 215$, $P < 0.05$). To explain this observation, we hypothesized that parasitized females are less choosy than unparasitized females, because their lifespan and reproductive opportunity are reduced. An alternate hypothesis is that parasitized female squash bugs may copulate for longer than unparasitized females. To determine how parasitism affects the likelihood and duration of copulation, we manipulated parasitism of female *A. tristis* and paired females with male *A. tristis*. We scored male mating attempts, copulations, and copulation durations. We found that unparasitized and parasitized females are equally likely to accept male mating attempts (Fisher's exact test: $n = 74$, $P = 1.0$), and that if a female is parasitized, this does not affect male mating effort (Wilcoxon rank-sum test: $n = 57$, $P = 0.97$). Additionally, our data suggest that parasitized females may copulate for longer than unparasitized females (mean \pm SD: 515.50 ± 208.56 min and 344.84 ± 189.02 min, respectively), although this difference was not significant (two-sample t -test: $n = 21$, $t = 1.97$, d.f. = 19, $P = 0.06$). We suggest additional

comparisons of copulation duration between parasitized and unparasitized females, and evaluation of whether extended copulations benefit parasite or host.

EVALUATION OF ANTIBODIES TO DETECT CYTOSKELETAL PROTEINS AND LYSING CONDITIONS IN JURKAT T CELLS TREATED WITH RAPAMYCIN

Matthew R. Peery (Dr. Yuko Miyamoto) Department of Biology

Rapamycin is an immunosuppressant derived from *Streptomyces hygroscopicus*. It acts by inhibiting the mTOR complex (mammalian target of rapamycin), which leads to an inhibition of many cell processes such as metabolism, migration and cytoskeletal organization. Previous research has shown that the mTOR complex is subdivided into two separate complexes with distinct structure and pathways; these have been named mTORC1 and mTORC2 (mammalian target of rapamycin complex1 and 2 respectively). mTORC2 has not been extensively studied, however there is research that links it to the cytoskeletal organization in the cell. This study evaluated the lysing conditions as well as the reagents needed to detect the Rho GTPase protein, Rac1, upstream signaling proteins of Rac1, paxillin (PXN) and focal adhesion kinase (PYK2), for future experimentation. These proteins were chosen because studies have linked mTORC2 to interacting with Rho GTPase proteins. Antibodies needed to detect the proteins were determined through lysing conditions and western blot analysis. Further studies need to be conducted determine if there is a connection between these specific proteins and mTORC2 in rapamycin treated T cells. Studies to show which complex controls these proteins' expression as well as if mTOR impacts the activated version of these proteins will be carried out in the future.

THE EFFECT OF CARBARYL ON THE PROTEIN REELIN IN THE BRAINS OF ZEBRAFISH LARVAE

Madeline L. Rector (Dr. Linda Niedziela) Department of Biology

The pesticide carbaryl has been shown to slow the development of larval zebrafish and influence the social behavior in adult zebrafish. The specific connection between social behavior and carbaryl exposure is not well established. However, one potential mechanism behind this relationship is exposure to carbaryl alters the expression of the glycoprotein reelin. Reelin aids neuronal migration and placement for neural pathways that are responsible for social behavior. Reelin is chemically sensitive and its production increases or decreases when certain chemicals are present. The specific effects that carbaryl has on reelin, however, are unknown. Therefore, the hypothesis tested was that with increased exposure to carbaryl, the expression of reelin in the larval zebrafish will decrease because lower levels of reelin in the brain are associated with abnormal social behavior. To accomplish this research, embryos were exposed to low (1.125 µg/ml), medium (5.625 µg/ml) or high (11.25 µg/ml) concentrations of carbaryl over a 3 or 7 day period. RNA from the larvae was isolated and tested for quality and quantity. Then, through the utilization of real-time quantitative PCR, we were able to analyze the expression of reelin in the larvae and compare it across the different concentrations.. Mortality and hatching rates were not affected by carbaryl, except after 7 days of exposure at the highest concentration. Preliminary results suggest that after exposure to carbaryl, reelin expression seems to moderately increase in a dose dependent manner. Additional research with an expanded range of exposure times would

help us better understand this relationship.

DO MOCKINGBIRDS NORMALLY COPY THEIR MIMETIC SONG DIRECTLY FROM MODEL SPECIES, OR FROM OTHER MOCKINGBIRDS?

Gabrielle E. Resh (Dr. Dave Gammon) Department of Biology

Many studies have investigated the function of avian vocal mimicry, but few have investigated its development on an individual level. Researchers generally assume mimics copy heterospecific models directly, but mimics may also copy the mimicked song produced by their own species. This study tested how mimics acquire their song using the northern mockingbird (*Mimus polyglottos*) as the mimic and the northern cardinal (*Cardinalis cardinalis*) and tufted titmouse (*Baeolophus bicolor*) as models. By comparing usage frequencies of different song types from the two model species by the models and the mimics, it was found that mockingbird usage frequencies of cardinal song were predicted by cardinal usage frequencies. In contrast, mockingbird usage frequencies of titmouse song differed dramatically from titmouse usage frequencies. It is therefore likely that mockingbirds normally copy each other when developing titmouse song, but more research is needed to determine who is copied when mockingbirds develop cardinal song.

Carret Essay Winners

“THIS AMERICAN CARNAGE” SUMMARY

Annalise Jaffe, Carret Essay Contest, 1st Place

For decades, scholars have been studying the rise of anti-intellectualism in America. This paper highlights the shift by contrasting the inaugural address of Thomas Jefferson with that of Trump's. The two are starkly different; one is written with complex syntax and a strong focus on the reunion of his divided country. The other utilizes simplistic sentences, dramatic language and a prominent “us vs. them” mentality. By researching the environment in which each speech was given, it becomes apparent that American values have changed from a desire for eloquence and complex language to a need for sensation, simplicity and immediate understanding. This change is first highlighted by analyzing the differing rhetoric of each man's speech. By applying the Flesch-Kincaid readability test (an algorithm that looks at word choice and sentence structure) to Trump's everyday speech, it is found that he speaks at a fourth-grade level. This conversational tone transfers into his inaugural address. A similar algorithm has been applied to every inaugural speech from 1789 to 2005. The results show that presidential speeches have been declining into lower and lower grade levels since the presidency of George Washington. Educated speech has lost its value and has been replaced by a more casual and simple style. The rise in anti-intellectualism is also seen in how Trump and Jefferson address their divided nation. Though they both experienced dramatic and vicious campaigns, their reactions are very different. Jefferson, upset that the American people had lowered themselves to such trivial interests, tries to assuage and reunite his upset country. In contrast, Trump capitalizes on the

need for sensation and accusations, finding an enemy that the American people could blame, and utilizing their agitated feelings in his speech.

EXCEPTIONALISM AND THE MODERN AMERICAN CONSCIOUSNESS: COMPARING THE FIRST INAUGURAL ADDRESSES OF THOMAS JEFFERSON AND DONALD TRUMP

Greg Fulcher, Carret Essay Contest, 2nd Place

This paper intends to take a critical, objective look at the first inaugural speech of President Thomas Jefferson in 1801, and the inaugural address of President Donald Trump in 2017. The paper employs analysis that is tied to style, deployment of rhetorical tools, and the context of the speeches themselves to delineate and compare the two. In addition, through an examination of American exceptionalism, the paper attempts to elucidate the stark differences that are already apparent between President Jefferson and President Trump. The interpretation of their rhetorical styles and content lends itself to a conclusion of a shift in American sensibility on the microscopic and macroscopic levels. In an individual sense, Thomas Jefferson appeals to a sense of duty and connectedness that comes from the necessity to properly nurture a fledgling democracy. For Jefferson, a man of great intellect and experience, it was imperative to appeal to his constituents in a way that may not have felt natural, by appealing to their sensibilities and making himself one of the population. He championed ideals of democracy as the shining light of civilization, carried forth by the American people, of virtue and prosperity through that virtue. President Trump, understanding the need for the same kind of connection, erred on the side of the sheer magnitude of the modern American experience. His proclamations are more matter-of-fact, and are imbued with the quasi-arrogance that is a crucial facet of modern-day American exceptionalism.

FEAR, DISUNITY, DISCORD AND REUNIFYING A DIVIDED NATION: AMERICA AND THE WORLD'S RECEPTION OF THOMAS JEFFERSON AND DONALD TRUMP'S FIRST INAUGURAL ADDRESSES

Julia Guilfoyle, Carret Essay Contest, 3rd Place

The recent election of Donald Trump to the Oval Office has been controversial and a source of disunity in the United States. While many are vehement supporters of President Trump, others fear what lays ahead for the future of our nation. Discord resulting from an election is not unfamiliar; however, this most recent presidential election in the United States seems to have had an especially large impact on disunity in the country. The election of Thomas Jefferson as President of the United States was also a controversial and intimidating change in the United States. Both Trump and Jefferson recognized this discord in the American public and attempted to pacify concerns and reunify the nation in their First Inaugural Address; however, the two presidents' approaches drastically differed. Jefferson presented his speech with humility, highlighted the positive aspects of his country and emphasized the importance of tranquility and pacifism in the future of the nation. Trump expressed confidence, accentuated the imperfections of the nation and emphasized the importance of aggressive and forceful tactics to ensure the American prosperity. Just as the two presidents' tactics starkly differed, so did the response to

the two presidents' addresses. President Jefferson's speech was well received and celebrated throughout America and the world. President Trump's speech provoked protests and riots in the United States and in the world's largest cities.

Chemistry

QUENCHING OF ELECTROCHEMILUMINESCENCE IN AQUEOUS SOLUTION BY NITRATE EXPLOSIVES

Kim A. Abrams (Dr. Karl Sienerth) Department of Chemistry

Forensic analysts today use methods like gas chromatography (GC) and high performance liquid chromatography (HPLC) to identify the components of explosives taken from crime scenes, but these are time-consuming, highly expensive, and require highly trained personnel.

Electrochemiluminescence (ECL) quenching is a faster and more cost efficient method for analyzing chemical components in explosives at a crime scene. Electrochemiluminescence (ECL) was used to test explosives (quenchers), TNT, RDX, Tetryl, and PETN, with two different luminescors, calcein and luminol, to generate a calibration plot exhibiting a mathematical correlation between the concentration of the explosive and the quenching factor. The reproducible slopes produced from each luminescor/quencher pair aid in determining if different explosives can be distinguished from one another. Salts, such as Na_2SO_4 , also resulted in a 30-40% increase in the signal intensity, resulting in a broader range of explosives concentrations to be measured. The explosives studied were found to vary in how efficiently they quenched the light produced by the luminescors. For instance, RDX when paired with luminescor calcein gave a slope of approximately 34, while TNT when paired with calcein as it produced a slope of approximately 9. This variation in quenching efficiency, or slope of the quenching vs. concentration plot, is the basis of the ability to use the ECL method to distinguish between different explosives.

STRUCTURAL ANALYSIS OF NEUROTRANSMITTER-STABILIZED AMYLOID-BETA OLIGOMERS

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

Toxic amyloid-beta ($\text{A}\beta$) oligomers have been identified as the damaging molecules in Alzheimer's disease. Their interaction with naturally occurring molecules in the brain, such as neurotransmitters, may provide some information about the chemical properties of oligomers, which are causing neuronal damage. The neurotransmitters dopamine and norepinephrine were used to stabilize $\text{A}\beta$ in oligomeric form and the structural changes in $\text{A}\beta$ which result from this reaction were analyzed using NMR and UV-Vis spectroscopy. The ability of dopamine and norepinephrine to stabilize oligomers was analyzed using the Thioflavin T assay for fibrils, the Bradford assay for peptide concentration, and SDS-PAGE for protein separation and analysis. Combined, the data indicates that $\text{A}\beta$ aggregated in the presence of dopamine or norepinephrine produces fewer insoluble fibrils, maintaining a higher concentration of soluble peptide oligomers than when $\text{A}\beta$ aggregates alone. The structural information obtained from UV-Vis and NMR

may provide some information about the specific structures of oligomers, which make them so toxic in the brain.

THE EFFECT OF LACTOPEROXIDASE ON DNA MUTATIONS IN THE PRESENCE OF ESTRADIOL

Erica L. Braschi (Dr. Kathryn Matera) Department of Chemistry

Oxidized hormones are thought to contribute to DNA mutations, which may lead to a variety of cancers. In order to understand the mechanism by which oxidized hormones may directly react with DNA, the reaction between estradiol and DNA was studied, both in the presence and absence of lactoperoxidase (LPO) and hydrogen peroxide (H_2O_2). H_2O_2 oxidizes estradiol and LPO catalyzes the oxidation. ELISA assays were used to analyze these reactions with DNA to determine if and how well the oxidized estradiol binds to the DNA. Results indicate that oxidized estradiol binds well to DNA, with the highest concentrations of bound estradiol found in the presence of both LPO and hydrogen peroxide. In addition, NMR spectra have been taken to examine the covalent linkage between oxidized estradiol and guanosine, in order to study the hormone's interaction with a specific DNA base.

STRUCTURAL ANALYSIS OF VANADIUM AND PEPTIDE COMPLEXES

Amanda M. Brechbill (Dr. Jen Dabrowski) Department of Chemistry

Previous research indicates that vanadium oxide complexes disrupt cell signaling, thus aiding in the treatment of Type II Diabetes as the bioinorganic vanadium complex is able to mimic insulin in the body. The focus of this research is to investigate the potential for similar vanadium oxide complexes to disrupt the cell signaling of bacteria to therefore have potential antibacterial applications. As a model, previously isolated alpha-helical peptides, with the amino acid sequences of BAMABMAB and ABAPyrBAHAB, are combined in solution with a commercially vanadium oxide complex, specifically $\text{VO}(\text{acac})_2$, for the synthesis of two vanadium-peptide complexes. It is important for this research to use alpha-helical peptides to better resemble biological systems to increase the potential antibacterial properties of the synthesized complexes. Structural analysis and characterization of the synthesized vanadium-peptide complexes were completed using transmission infrared spectroscopy, absorbance UV-Vis spectroscopy and ^1H , ^{13}C , and ^{51}V NMR spectroscopy. The data collected from the various spectroscopic techniques indicate that two unique complexes were synthesized, but additional research will have to be conducted to determine antibacterial properties of these complexes.

THE EFFECTS OF AMYLOID BETA OLIGOMERS ON THE OXIDATION OF LIPIDS

Shelby E. Cuddeback (Dr. Kathryn Matera) Department of Chemistry

Oxidation of lipids and other biomolecules is a potential cause of the neurodegeneration seen in Alzheimer's disease (AD). Amyloid beta ($\text{A}\beta$) is a peptide found in the characteristic plaques in the brains of AD patients, and it is proposed to be a toxic, oxidizing agent in its oligomeric form. The oligomeric species were successfully stabilized with the phenolic compound gallic acid;

these stabilized oligomers were then used to test their oxidative ability on a cell membrane model system. Large unilamellar vesicles (LUVs) were synthesized as a cell membrane model system and then tested for A β oligomer-induced oxidative stress using calcein as a fluorescent indicator of membrane disruption. In addition, ultraviolet-visible spectroscopy (UV-Vis) and a lipid hydroperoxide assay were used to measure the oxidation of lipids in the presence of A β oligomers. LUVs produced more fluorescence in the presence of A β oligomers than the buffer control, suggesting the oligomers are disrupting the integrity of the vesicles, a hypothesized result of oxidation. This finding is supported by the UV-Vis and lipid hydroperoxide assays, and combined give strong indication for the oxidation of lipid molecules by A β oligomers.

AGGREGATION MECHANISMS OF AMYLOID-BETA AND INSULIN

Vanessa A. Grove (Dr. Kathy Matera) Department of Chemistry

Recent studies have shown that individuals who have diabetes are at a higher predisposition of Alzheimer's disease (AD). Insulin, which plays a large role in diabetes, is a peptide similar in size to amyloid-beta (A β), the peptide that makes up visible plaques found in the brain of AD patients. Insulin is made up of two main peptide chains, referred to as the A and B chains. Both A β and insulin peptides have a tendency to self-aggregate due to their flexible secondary-structure assemblies. Despite this, there has been little to no research done on the aggregation patterns of A β and insulin and whether interactions between the two peptides is an explanation for the close correlation between AD and diabetes. To study this interaction between peptides, Thioflavin T fluorescence assays and gel electrophoresis were used to examine the aggregation patterns of these two biomolecules, both separately and mixed. The findings from these techniques suggest that interactions between A β and insulin cause inter-peptide aggregation to occur. Additionally, recent studies indicate that the insulin B chain causes higher aggregation levels of insulin. It is thought that A β may possibly play a role in the reduction of insulin into its respective chains, thereby exposing the B chain to solution and increasing the rates of aggregation.

DEVELOPMENT OF AN EFFICIENT ROUTE OF SORBITAN SYNTHESIS FROM SIMPLE SUGARS USING BCF ACTIVATION OF ALLYLTRIMETHYLSILANE

Brendan T. Kearney (Dr. Jen Dabrowski) Department of Chemistry

Sorbitan is an organic compound which acts as a common industrial emulsifier. It has important uses in areas such as food preservation and pharmaceutical production. Currently, this compound is synthesized from crude oils, an unselective and inefficient process which requires high amounts of energy. This particular research dealt with the reaction between galactitol, a simple sugar, and compounds allyltrimethylsilane and tris(pentafluorophenyl)borane (*BCF*). The main method of analysis used for this research was by nuclear magnetic resonance spectroscopy (NMR), which is able to determine the chemical properties of atoms by checking the magnetic signal of individual atoms. Throughout the research, these three reagents were tested in many different conditions. Control reactions were run between all three starting reagents. Preliminary results showed that the addition of allyltrimethylsilane and BCF to the simple sugars galactitol and sorbitol yields a product, which is still in the process of being identified. Without BCF, no

conversion of the starting galactitol occurs. An un-hypothesized reaction between allyltrimethylsilane and BCF without galactitol yielded several distinct byproducts. Future research would focus on identifying and analyzing the products.

USING DYNAMIC LIGHT SCATTERING TO DETERMINE THE MECHANISM OF PERIODIC PRECIPITATION (LIESEGANG) REACTIONS

Matthew C. Laing (Dr. Joel Karty) Department of Chemistry

When certain pairs of aqueous (i.e. dissolved in water) salts are mixed, they react to form an insoluble solid called a precipitate. When these precipitation reactions are performed in a gel, the solids can form in the pores within the gel and are deposited in a series of bands. Such reactions, called Liesegang reactions, have been known to occur in various natural systems, but the mechanism by which the reaction occurs is not fully known. There are currently two leading theories that attempt to explain this phenomenon: (1) autocatalytic growth theory, which states these bands form by larger precipitate particles growing rapidly at the expense of smaller particles dissolving, and (2) coagulation theory, which states the bands form by different sized precipitates clumping. In this particular study, we employed dynamic light scattering to probe the size of the particles as a function of time in the Liesegang reaction that produces magnesium hydroxide, in order to obtain support for one of these theories. Our preliminary results appear to support autocatalytic growth theory over coagulation theory.

STABILIZATION OF AMYLOID BETA PEPTIDE AGGREGATES USING PHENOLIC COMPOUNDS

Ian R. O'Leary (Dr. Kathryn Matera) Department of Chemistry

Alzheimer's disease has been hypothesized to be caused by aggregation of a naturally occurring protein in the brain, amyloid beta. Phenolic compounds such as gallic acid have been found to cause the formation of toxic amyloid beta (A β) oligomer aggregates, which have been hypothesized to contribute to Alzheimer's disease (AD). A detailed understanding of how these phenolic compounds interact with A β is essential to the treatment of AD. Previous research shows that phenols can stabilize toxic oligomer A β aggregates alone and disaggregate larger fibril plaques into smaller oligomers. This research explores different phenolic compounds and their interactions with A β aggregates at a variety of pHs as aggregation occurs more readily at a higher pH. Utilizing UV-visible spectroscopy, gel electrophoresis, Thioflavin T assays, and NMR, results indicated phenols are interacting via intermolecular forces with A β oligomers and fibrils. Each of these methods revealed that gallic acid is changing, either through intermolecular interaction with peptides or structurally by oxidation, in the presence of A β . This research suggests a quinone species is forming from the gallic acid and then reacting with A β .

CHEMOTAXONOMY OF SOURWOOD AND POPLAR HONEY

Valeria Rizzi, Meghan E. Peterson, & Tanner C. Pinheiro (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, from possessing anti-inflammatory properties, to even some anticancer activities. However, different plants have different flavonoids, each possessing different beneficial properties, and by using honey as a bio indicator, we can isolate and identify the specific flavonoids that come specifically from poplar and sourwood trees. This chemotaxonomy of Poplar and Sourwood honey serves as baseline research and was done 1) via high-performance liquid chromatography (HPLC) separation of honey samples and the subsequent comparisons of HPLC retention times and UV-vis spectra with those of flavonoid standards, 2) via HPLC separation of flavonoid standards and subsequent acquisition of HPLC chromatograms and UV-Vis spectra on those HPLC fractions and 3) via silylation of flavonoids and gas chromatography mass spectrometry (GCMS) analysis. These techniques were successfully tested for method validation and will be used to identify the presence of specific flavonoids in sourwood and poplar honey.

SELF-ASSEMBLY OF MONLAYERS ON GRAPHENE WITH PYRENE AND CYCLODEXTRIN DERIVATIVES

Emily G. Swanson (Xue Zhen, Dr. Philippe Buhlmann) Department of Chemistry, University of Minnesota

The goal of this project is to create functionalized-graphene surfaces that can be used in sensors for early disease detection. In this work, graphene was functionalized through self-assembly of pyrene and cyclodextrin derivatives driven by interactions due to the similarity in structure of graphene and pyrene. These derivatives are able to interact with other biomolecules, which is how the sensors can be used to detect disease. Graphene was grown on copper sheets by chemical vapor deposition. Six different pyrene derivatives were either commercially bought, or synthesized. The perbenzylated α -, β -, and γ -cyclodextrin were also synthesized and used for self-assembly. The functionalized graphene substrates were characterized using contact angle goniometry. By varying the concentration of each derivative in the self-assembly solutions, a relationship between surface coverage and concentration was found, providing the minimum concentration needed for the assembly monolayers on graphene without forming multilayers. This relationship was also used in order to determine the binding affinity, β , for the various derivatives. This also allows for comparison of the affinity of different derivatives to the surface of graphene.

Communications

“WAIT FOR IT”: THE MARKETING OF BROADWAY’S NEW SMASH HIT *HAMILTON* AND TICKET SCARCITY

Nicole B. Ackman (Professor George Padgett) School of Communications

The popularity of Broadway’s latest hit musical, *Hamilton*, has resulted in ticket scarcity and wildly overpriced resale tickets. However, although many of the musical’s fans have never seen the show in the theater, they have become intently engaged both online and off. This paper

explores the following question: When tickets simply aren't available, how can such a popular show be marketed to the masses in a way that creates a win-win for the show and fans alike? It will look at how marketing efforts for *Hamilton* focus on providing a wide array of online and offline content experiences that keep fans constantly and enthusiastically engaged—despite their current inability to see the show live. This approach was researched by surveying the show's fans and by conducting an interview with an employee of *Hamilton*'s advertising agency. By understanding how the phenomenon of *Hamilton*'s ticket scarcity was dealt with, other marketers may be able to use these methods for future Broadway hit shows.

EFFECTS OF LIVE TWEETING ON USER ENGAGEMENT IN PREMIUM SPORTING EVENTS

Bryan R. Anderson (Dr. Qian Xu) School of Communications

Twitter allows users to interact with one another in real time with a function called live-tweeting. Sports teams have employed different live-tweeting message strategies to compete for followers' attention and maximize their target audience's engagement. However, whether these strategies are successful and how they influence engagement in live-tweeting are underexplored. This study adopts a quantitative content analysis to answer these questions by examining the use of live-tweeting in baseball, basketball, and hockey games. A total of 540 live-tweets were collected from 12 sports teams in 12 games and coded for their use of different content strategies, including use of multimedia components (i.e., video, still image, GIF, emoji, and link), use of conversation starter/facilitator (i.e., call to action and giveaway), variation of message visibility (i.e., use of mention and hashtag), and valence of tweets (i.e., positive, negative, and neutral). In this study, follower engagement is operationalized as the number of retweets, number of likes, and number of replies received by each tweet. Two coders first coded a small sample of tweets to establish inter-coder reliability for all of the coding categories. Findings from this study suggest different content strategies vary in their ability to affect tweet virality (i.e., the number of retweets), emotional support (i.e., the number of likes), and direct conversation with teams (i.e., the number of replies). Among five multimedia components, still image was the only one with a positive impact on user engagement. The use of links and mentions negatively influenced user engagement. Compared to neutral tweets, both positive and negative tweets led to more replies. In addition, positive tweets increased tweet virality and likes. This study furthers the understanding of live-tweeting in sports and provides practical implications for sports teams and organizations to adopt appropriate content strategies to communicate with followers effectively.

EQUITY THROUGH TECHNOLOGY: MOBILE FRIENDLINESS, USABILITY AND ACCESSIBILITY FOR SCHOOL WEBSITES

Molly E. Bauer (Dr. Amanda Sturgill) School of Communications

In recent years, schools across the country have been putting more information and resources online. While this can save the school money and time, it can also create equity issues. For instance, non-white and lower-income citizens are significantly more likely to have limited internet access or be "smartphone dependent," which Pew defines as users "who are restricted

fully or in part to using a cell phone for Internet access” (Pew, 2015). Since these families likely access most or all of their school’s information via a mobile device, if the website is not compatible with mobile devices, they may have decreased ability to access information. Students from these groups already struggle with achievement gaps (NAEP, 2015; Reardon, 2011), so limited parental access to technology could exacerbate inequity. The accessibility of websites on both desktop and mobile platforms is also a pressing issue, as about one in five Americans report having a disability (Census, 2012). Will all this in mind, the essential question addressed by or research is: Are the websites for the 100 largest school districts in the United States, serving nearly 11 million students, equitably accessible for users, in terms of both mobile friendliness and disability accessibility? To determine the accessibility and mobile compatibility of the 100 school district websites, online tools created by AChecker and Google were used. These tools evaluate a given URL and provide feedback on the accessibility issues within the site. Our research found that 27 percent of the district sites are not mobile friendly, while 74 percent of the district sites have issues with accessibility. Our research concluded that many large school district sites are not as accessible as they could be for smartphone dependent users or users with disabilities. If mobile-dependent families or disabled parents are unable to access the same information as other families, this could perpetuate and deepen digital and educational divides.

FACEMASK: A STUDY OF TRANSYOUTH & FOOTBALL

Zachary E. Bocian (Professor Youssef Osman) School of Communications

FACEMASK contributes to the School of Communication’s Cinema & Television Arts Bachelor of Fine Arts thesis requirements. The purpose of this creative project is to focus on the social and psychological implications of transgender individuals considering transitioning from the gender they were assigned at birth to their preferred gender. It will also observe the early stages of experimenting with gender non-conformity and the societal perceptions of such. The central research questions of this research are: What fears and pressures come to light when individuals' consider transitioning? And, how do individuals deal with the social and psychological implications that come along with their transition? The ultimate goal of this cinematic project is to contribute to the creation of a humane and relevant work that focuses on a vulnerable marginalized minority and the discrimination and stereotyping they face. This feature film package will include; a full feature length screenplay, a projected production schedule and budget, visual references as well as a short film production (trailer). This work was developed directly from what this research revealed in hopes of one day providing for a film that accurately expresses the trans experience. The factual details within this story were obtained through research that was approved by the Institutional Review Board (IRB).

MADE IN COLOMBIA – DRUGS, WAR AND VIOLENCE: THE FRAMING OF COLOMBIA IN *THE NEW YORK TIMES* VS. TOURISTS’ PERCEPTION

Skyler A. de Groot (Dr. David Bockino) School of Communications

In the fall of 2016, Colombia ended what was one of the longest conflicts in modern history, when its government negotiated a peace settlement with the country’s largest rebel group, the FARC. This agreement ended a war “that killed a quarter of a million people and made their

nation a byword for violence” (The Guardian). Research has suggested that media play an important role in the creation of a country’s reputation and that this portrayal has “important implications for global flows of finance, trade and tourism” (Schorr, 2011). Several scholars for example, have examined the media portrayal of Africa over the past few decades—these studies, however, have often jumped to conclusions without proper scope or context (Scott, 2017). To date there is limited research related to media framing and international reputation of Colombia. The goal of this study, then, is two-fold. First I will explore the media framing of Colombia over the past fifty years through a textual analysis of 15,070 Colombia related headlines in *The New York Times*, a newspaper that has previously been used in this type of analysis to represent the larger news ecosystem (Scott, 2017). Second, I’ll examine the link between media portrayal and the development of Colombia’s reputation through a convenience sample of twenty-four semi-structured interviews of international tourists in Medellín and Bogota. Preliminary findings suggest that news about drugs and violence in Colombia appear frequently in *The New York Times*. Since previous scholars have found that “negative coverage of nations...correlate[s] negatively with public views of nations” (Wanta, Golan & Lee, 2004), this suggests the development of a negative reputation for Colombia. This assertion is supported by the preliminary findings from the interviews where people indicated that they traditionally view Colombia as a dangerous drug ridden country due to news media and recent shows *Narcos*. The interviews also showed, however, that this reputation can be countered through interpersonal communication with people who have visited the country.

JE SUIS SLACTIVISTE?: SENDING SUPPORT ACROSS BORDERS THROUGH PROFILE PHOTO CHANGE ON SOCIAL MEDIA

Heather P. Deiner (Professor Amanda Sturgill) School of Communications

After the Paris bombings of 2015 many Facebook users changed their profile pictures or added the French Flag filter in support of the nation. NPR responded to the overwhelming use of filters with a question posed towards Facebook users as to why they chose to use the filter or not. This study examined the 602 Facebook comments received, with each comment being coded into two categories: people who did use the filter and people who did not. This study revealed the support and biases surrounding online activism and the difference between solidarity and slacktivism. This study may contribute to the discussion to the effectiveness of online activism for major social movements and how social leaders will respond to concerns and criticism.

CROSS THE BORDER: A STUDY ON THE FRAMING OF GLOBAL MIGRATION BY NATIONAL NEWS MEDIA

Emily A. Dzilenski (Dr. Glenn Scott) School of Communications

A timeless, yet complicated human experience, migration has carried civilization and modernity to every corner of the globe. Expedited today by forces like globalization and telecommunications, migration’s modern manifestation now threatens international stability, human rights standards, availability of resources, and security. While many cope with the challenges of mass migration firsthand, many others attain their understanding of this phenomenon from the news media that relay its patterns and consequences. By means of a

content analysis, this study aimed to understand both how national news media frame migration to their domestic and foreign publics. Through a cross-national comparison of recent online news publications from the United States, Germany, and Spain, this study concluded that national news medias did not demonstrate a tendency to present an overly positive or negative frame, but rather, they presented more holistic and balanced stories about migration to their publics. News medias did maintain a significant international focus when framing migration and frequently emphasized public discontent with the handling of migration's consequences by governments and international organizations.

AN ANALYSIS OF HILLARY CLINTON-SPONSORED ADVERTISEMENTS DURING THE 2016 PRESIDENTIAL ELECTION

Joelle M. Halle (Dr. Byung Lee) Department of Communications

Despite the evolution of mass media, political advertising remains the primary means by which candidates directly reach voters. The 2016 presidential election between Hillary Clinton and Donald Trump was not an exception to this rule. Since the birth of political advertising in the 1960s, experts have investigated advertising strategies and trends in order to uncover patterns in voter behavior. Through content analysis, this study investigated the tone, topic, and content of Clinton-sponsored advertisements during the 2016 presidential election. The results of this content analysis illustrate an advocacy-heavy advertising strategy for Clinton, with a shift from policy-focused advocacy ads to character-focused attack ads as Election Day drew nearer. Among other topics, rights, leadership, and the economy were most commonly featured in the advertisements.

THE NATURAL HAIR JOURNEY: SOCIAL MEDIA COMMUNITIES AND THE PROMOTION OF NATURAL HAIR ACCEPTANCE AMONG BLACK, FEMALE COLLEGE STUDENTS

Cameron M. Jackson (Dr. Vanessa Bravo) School of Communications

A second wave of the natural hair movement is emerging among young, Black women. This movement is a rejection of the European ideal of beauty and promotes acceptance of afro-textured/kinky coily hair, which has historically been viewed as unkempt and unprofessional. Due to inexperience with caring for their natural hair texture and judgment from older generations, many young Black women are turning to social media platforms to gain information and support, and to become a part of a larger community that embraces the natural hair movement with pride. YouTube, in particular, is a platform that is allowing content creators and consumers to redefine the cultural understanding of natural hair. Using framing theory as its theoretical framework, this study analyzed YouTube content (10 videos and 250 users' comments) to identify the most salient themes that are being disseminated online about the natural hair journey. Inter-coder reliability was measured for coding using Holsti's coefficient. Once the themes were identified, described and analyzed through a qualitative content analysis, they were used to further explore the topic through in-depth interviews with 17 Black, college-aged women. These women were asked to articulate their experiences of wearing natural hair and describe how social media may or may not have influenced this experience. Preliminary

findings suggest that YouTube videos helps to promote overwhelmingly positive narratives, which is reflected in the self-confidence and sense of freedom that women describe after going natural. YouTube comments and interview findings reveal that the video content aids women in overcoming challenges during their natural hair journeys, such as facing societal judgment and going against familial norms. However, the interview findings also reveal concerns surrounding the accuracy of depictions on social media platforms as it relates to colorism and hair texture and the influence of branded content. This study discusses the implications of the natural hair movement on the establishment of a strong Black identity, as well as the transformative social impact of online communities.

THE NEGATIVE PORTRAYAL OF ISLAM AND PERPETUATION OF ISLAMOPHOBIC IDEAS BY AMERICAN MEDIA IN THE TWENTY-FIRST CENTURY.

K McKay (Dr. David Copeland) School of Communications.

The tragic events of September 11, 2001, colored 21st-century American history and has given rise to a new wave of Islamophobia—defined as having fear of or negative feelings towards Muslims and their communities—in America, fueled by the more recent acts of terror committed by radical Islamic extremists. When these events happened, the media were forced to decide how to cover these events, knowing their coverage would be critical to the American public’s understanding of the issues that face our country in the “post-9/11 society” in which we live. This paper seeks to analyze the role media have played in the growth of Islamophobia in the United States, suggesting the media may be more responsible than Americans are aware of. Using stories from the top 10 U.S. newspapers based on circulation to analyze the coverage of the 2013 Boston Marathon bombing, 2015 Chattanooga shootings, 2015 San Bernardino attack and 2016 Orlando shootings, and a selection of evening news broadcasts following President Trump’s executive order—“Protecting the Nation from Foreign Terrorist Entry into the United States”—this presentation concludes by showing how there is a positive correlation between how the media portray Muslims and Islam and the American public’s perception of Muslims and Islam.

CORPORATE SOCIAL RESPONSIBILITY AND WOMEN’S ENTREPRENEURSHIP: THE CASE OF COCA-COLA’S 5BY20 INITIATIVE

MaryClaire E. Schulz (Dr. Barbara Miller) School of Communications

In recent years, some public relations and other communications efforts have focused both on illustrating company values and establishing how companies are contributing to communities in a positive way. Global companies are increasingly employing corporate social responsibility (CSR) initiatives, or efforts to incorporate ethical considerations into business practice, to engage company stakeholders. In 2010, the Coca-Cola Company launched the 5by20 initiative to empower 5 million women entrepreneurs globally by 2020. By providing resources such as finances, mentorship opportunities, and business training to women involved in the company’s global supply chain, Coca-Cola is connecting with stakeholders globally and improving both its profitability as a corporate entity and the economies of stakeholder communities. The initiative

has also received a number of awards and praise from business and entrepreneurship organizations that applaud Coca-Cola's efforts regarding the empowerment of women interested in entrepreneurship. Through an in-depth qualitative case study, this research evaluates Coca-Cola's implementation of the 5by20 program through corporate communications initiatives in order to understand not only the effects of globally focused CSR programs on corporate financial gain, but also the economic implications for larger stakeholder communities. This research is framed by stakeholder theory, which establishes the importance of engaging stakeholders to both benefit a company's mission and create relationships with important publics, in addition to organization-public relationship theory, which outlines key strategies organizations use to build relationships with their publics. Findings suggest that Coca-Cola clearly communicates its main three goals of the 5by20 initiative across sources by using similar language and including goals of the initiative in nearly every explanation of 5by20's purpose. In addition, Coca-Cola employs the relationship-building strategies of "openness," "assurances," "stewardship," and "sharing of tasks" to engage relevant publics. The practical applications of this research are vast as companies, particularly controversial ones, are looking for ways to successfully build relationships with stakeholder groups through CSR initiatives. Lessons learned from Coca-Cola's successful 5by20 communications strategies may prove valuable for other corporations looking to genuinely engage with stakeholders on a global scale.

GLOBAL INTERNET LEADERS IDENTIFY ISSUES CRUCIAL TO ACHIEVING UNITED NATIONS 2030 SUSTAINABLE DEVELOPMENT GOALS

Anna M. Zwingelberg & Maya D. Eaglin (Professor Janna Anderson) School of Communications

What crucial Internet issues must be addressed to best work to achieve the UN's 17 Sustainable Development Goals by 2030? Nearly 100 ethnographic video interviews were conducted with experts at the United Nations-facilitated Global Internet Governance Forum in Guadalajara, Mexico, in the fall of 2016. More than 1,500 global policy experts, non-governmental organization administrators, academics, technologists, and government, business, and civil society leaders met to discuss current issues and work to facilitate optimal evolution of communications networks for global good. A 10-student research team from Elon University recorded responses totaling more than five hours of content, with print transcripts totaling more than 60 pages. The interviews were posted as part of the Imagining the Internet Center's documentary coverage of the Internet's ongoing evolution. This research presents responses from people representing a broad range of geographic, social, political, and economic backgrounds to a voluntary survey in a convenience sample gathered in the village square, meeting rooms, and hallways of IGF. This study of concerns shared by the leaders of ICANN, IEEE, IETF, ITU, governments, top technology companies, and civil society yielded a diverse and revealing collection of viewpoints about the best ways to evolve the Internet to serve global good. Results reveal stakeholders' common concerns and conflicting opinions about how to best deal with them, and they see global governance slowly evolving to more-positively implement technology.

PERCEIVING THE BLACK BOX: UNDERSTANDING TRUST IN ALGORITHMS

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

Algorithms – the problem-solving programming “recipes” written by humans and sometimes by other algorithms to automate processes and enable actions via computers – are invisibly insinuating themselves into every aspect of modern life. Because of algorithms it is possible to search the internet, online date, and use a GPS system. The algorithms that are 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. People’s lives are increasingly being impacted by algorithms in more consequential ways, as algorithms are even being incorporated into professions like law enforcement and healthcare. This study investigates the perceptions that people have of such “black box” algorithmic systems by presenting a series of hypothetical interactions to survey respondents. Scenarios include interactions with an autonomous vehicle, predictive policing, Big Data-driven health, and Facebook newsfeed curation. Analysis of qualitative response data from a pilot sample (N=62) provides some preliminary insights into how users understand and reason about these black box technologies. In particular, the findings suggest that multiple conceptions of trust and mistrust in these systems inform users' reasoning about their adoption of new algorithm-based technologies.

Computing Sciences

ANALYZING BODY POSTURES AND SELF-INJURIOUS BEHAVIORS USING A KINECT

Alexis M. Goslen (Dr. Shannon Duvall) Department of Computing Sciences

Visual input devices like web cameras, the Kinect gaming device, and the Leap Motion gaming device are currently relatively cheap and easy to access. We are studying how best to leverage these devices for at-home monitoring of children with disabilities. We have three major goals for this research: to detect Self-Injurious Behaviors (SIBs) like hand-biting or head-banging, to detect body postures, and to test a mapping of body posture to emotion defined in previous research. We have developed a program that detects both SIBs and body postures using the skeleton tracking features with the Kinect, and have tested the accuracy of the interpretation of these postures. We will present our findings of accuracy and limitations on posture detection with the Kinect. We will also present our results for the emotion mapping portion of the research. We are using open-sourced 3D position data collected through other emotion-based experiments and running the data through our algorithms to see if our system detected body postures indicative of an emotion. The eventual goal for this project is to create software that uses visual input of all kinds to detect, predict, and react to emotional states. We can create interactive spaces in which lights and sounds respond to a child based on his or her emotional needs. Currently the systems require permanent installation or calibrated cameras. Our system is much cheaper and easier to use, making it more widely applicable.

Economics

THE IMPACT OF MENTAL HEALTH ON WAGES

Justin C. Bellinger (Dr. Stephen DeLoach) Department of Economics

According to the National Institute of Mental Health, out of the 18.1% of adults who suffer from some form of mental illness in the U.S. just over half receive any form of treatment. While it is widely accepted that health is a determinant of wages for diverse populations such as the elderly and pregnant women, there is little research on the impact of health on wages of all labor force participants. Specifically, there has been very little research on the impact of mental health on wages. Previous literature describes health affecting wages in two different ways. One, it will decrease hours worked which will lead to a decrease in total earnings, or two, it will lead to a lower accumulation of human capital in the form of lower education or experience due to missing school or work. To identify the impact mental health has on wages, using data from the 1997 National Longitudinal Study, I utilize a modified Mincer Model introduced by Contoyannis and Rice (2000) that explains wages as a function of education, experience, health, and the effect of other variables. To control for the endogeneity between mental health and wages I use a Two-Stage least squared (2SLS) regression analysis.

SHIFTING REGIONAL WEALTH AND THE MARKET FOR LATIN AMERICAN ART

Danielle M. Brown (Dr. Stephen DeLoach) Department of Economics

Previous research has shown that art auction prices may be related to the state of the economy in a particular region. For example, Hongfei Ye, Yun Wang, and Shaomin Huang (2016) found that the Chinese art market boom coincided with the Chinese economic boom in the early 2000s. With positive economic growth in Latin America from 2010 to 2015, has there been an increase in the prices of Latin American art sold in those years? The variation in artworks sold at each auction makes a more in-depth analysis necessary. Previous literature shows that the factors including artist, medium, size, and others significantly influence hammer price, but little research has been done linking art sales to economic development. This study uses data from Latin American art auction catalogues from Christie's and Sotheby's between years 2006 and 2016. A hedonic pricing model is estimated to determine the presence of a wealth effect. Research in this area is valuable because of its potential to better inform art collectors. Preliminary results show no significant relationships exist between the price of the work and year in which it is sold, but rather that it is an individual artwork's unique characteristics that determine its price.

EXAMINING THE IMPACTS OF DEBT ON FIRST-TIME HOME BUYERS

Holly A. Brueggman (Dr. Jennifer Platania) Department of Economics

The housing market is one of the most critical economic indicators and drivers of the US economy, as evidenced by the Great Recession following its collapse in 2008. Its performance and health should be of utmost concern to those interested in understanding the future direction of the US economy. In this paper, I look to the population of young adults who are graduating

college and are looking to purchase their first homes to help shed some light on the various factors affecting the home purchase decision. In particular, with so many college graduates entering the workforce riddled with student loan debt, the question is posed: what impact does the increasing level of debt among young adults have on their decision to purchase a home? I use panel data from the National Longitudinal Survey of Youth to examine the relationship between the time of first home purchase, the value of the home, and amounts of debt and income, using the time variable to control for changes in policy and loan availability before and after the market crash. Preliminary results show only a minute shift in the value of homes purchased by those saddled with debt after 2008. These trends in home purchases related to debt after the crash have crucial implications regarding the future path of the US housing market and emphasize the importance of sound personal financial decisions in the overall health of the economy.

CONGESTION MAKES IT HARDER TO BREATHE: DO HIGH OCCUPANCY TOLL LANES REDUCE EMISSIONS?

Kenneth C. Crew (Dr. Tonmoy Islam) Department of Economics

Over the past few decades, traffic congestion in the United States has worsened. Not only are there more automobiles on the road but also each automobile is traveling a further average distance. This congestion has led to increased travel costs and travel time, harming productivity, the environment and the overall health of U.S. citizens. Moreover, aggregate carbon emissions have increased simultaneously even with new automobile efficiencies and government standards. Given these efficiency advancements, the rise in overall carbon emissions can be partially attributed to rising congestion. This paper discusses different forms of road infrastructure investments U.S. governments engage in, and ultimately seeks to determine if high occupancy toll lanes are successful at alleviating congestion, thus reducing carbon emissions. To determine causality, multiple regressions were run using fixed effects and two-stage least squares models with panel data from the Texas A&M Transportation Institute and the U.S. Energy Information Administration. The results to date show urban areas that open a second high occupancy toll lane will on average experience about a 7.5% reduction in peak travel time relative to off peak travel time two years after implementation.

THE RELATIONSHIP BETWEEN INCOME & THE HOSPITALIZATION RATES OF AMBULATORY CARE SENSITIVE CONDITIONS

Justin H. Morin (Dr. Katy Rouse) Department of Economics

Despite the relative high quality of its healthcare system, considerable inequality in access to healthcare still exists within the United States. Ambulatory Care Sensitive (ACS) Conditions are defined as those for which good outpatient care can potentially prevent the need for hospitalization or for which early intervention can prevent complications or more severe disease. These conditions include Asthma, Angina, Pelvic inflammatory disease, Gastroenteritis, Congestive heart failure, Severe ENT infections, Epilepsy, Bacterial pneumonia, Pulmonary/other tuberculosis, Anemia, Dental conditions, and Cellulitis, among others. Early intervention for these conditions is often based upon access to health care and regularly seeing a primary care physician. Therefore, these conditions are likely to be highly sensitive to income

inequality and access to quality health care. However, to date there has been little research examining whether a causal link exists between income and hospitalization for ACS conditions. This research seeks to narrow these gaps in current literature. Using the MEPS data and OLS regression, this project will examine whether income inequality leads to a higher rate of hospitalization for ACS conditions in the United States, and if so, why differences in income result in this effect.

WAGE DISCRIMINATION IN THE GERMAN LABOR MARKET: AN EMPIRICAL ANALYSIS OF LABOR MARKET OUTCOMES OF TURKISH IMMIGRANTS

Catherine A. Ray (Dr. Stephen DeLoach) Department of Economics

In the 1960s, Turkey, along with other countries, was invited to West Germany as guest workers to help rebuild Germany after World War II. Today, Turks make up roughly three million of Germany's total population of eighty million people, making them the largest ethnic majority in Germany. The purpose of this paper is to test whether the differences in wage between Turkish immigrants and German natives is due to discrimination in the German labor market. Using panel data from the German Socio-Economic Panel, I conducted an empirical analysis to measure whether the German-Turk wage difference is measurable or immeasurable, and thus whether or not it is discriminatory. My results found that there is no systematic discrimination in the German labor market for Turkish immigrants (4.5%), however it does show that a potential solution for the wage differential could be a lateral entry program for immigrants into German vocational trainings. Access to vocational training could help improve wage gaps of immigrants.

THE FACTORS THAT INFLUENCE NATIVE & NON-NATIVE WAGES IN THE UNITED STATES' AGRICULTURE SECTOR

Nicholas F. Rhyne (Dr. Brandon Sheridan) Department of Economics

This paper analyzes the wages of native born and non-native born workers in the United States agricultural sector. Whereas most research on the wage differences of non-native and native workers focuses on the local level, this paper looks at a much broader macro-level industry. Understanding the wage trends of workers in one of the world's largest food suppliers is vital to future economic and agricultural planning. Utilizing United States Census data this paper analyzes the factors that influence the large discrepancies in native and non-native wages in the US agricultural sector. This study uses standard ordinary-least-squares regressions, fixed effects, and panel data to understand and evaluate the data. Preliminary results indicate that non-native agricultural workers make approximately 23% less per year than their native counterparts in the same occupation. Further, the results indicate that a non-native agricultural worker would have to work in the United States for approximately forty-five years before they would expect to make the same as their native counterparts. More simply, non-native workers have to spend close to a century in the industry before they earn the same as a native born worker of comparable work experience. The implications of this wage gap are far-reaching. As immigration, global wage competition, and nationalist economics grow more and more salient understanding why this gap is present could help policymakers and economists in the coming decades.

EFFECTS OF ADOLESCENT PHYSICAL EDUCATION ON FUTURE OBESITY OUTCOMES

Andrew A. Van Hoof (Dr. Katy Rouse) Department of Economics

Over the past few decades, the incidence of obesity in the United States has grown significantly, according to the Centers for Disease Control and Prevention. As policymakers attempt to identify ways to tackle this epidemic on a national scale, it is important to identify which policies are impacting the issue in a significant way. A significant amount of academic research has been dedicated to discovering how physical education can influence BMI in the short run, but few studies have come to conclusive results, finding only small effects on varying subsets of the population. In order to further the literature, this research aims to determine if there is a causal link between having physical education in primary and secondary school and obesity outcomes in the long run, measured by BMI. Data on BMI, physical education levels, and a variety of control variables are retrieved from the National Longitudinal Survey of Youth, 1997 Cohort. The instrumental variable model leveraged for this study eliminates selection bias in the dataset by using state mandated physical education as well as state obesity level in 1997 to instrument for time spent in physical education. Despite controlling for both endogeneity and individual subject characteristics, no significant relationships between physical education and both present and future BMI are found, leading to the conclusion that other lifestyle or genetic variables may play a more significant role in predicting long term obesity. This conclusion calls into question the effectiveness of current physical education techniques and policies, however future research on the subject will be required before any causal relationships are uncovered.

Education

THE BRIDGES AND BARRIERS TO ENVIRONMENTAL EDUCATION ON AN ECO CAMPUS

Amber K. Adams-Kuebler (Dr. Scott Morrison) Department of Education

Previous research has shown that meaningful outdoor experiences are significantly more beneficial for the development of environmentally conscious habits later in life than more traditional forms of environmental education (e.g., Chawla, 1999; Chawla & Cushing, 2007; Sobel, 2013). More and more children, however, are growing up attached to electronic screens rather than exploring in the woods and playing in the rain -- what Louv (2010) calls “nature-deficit disorder” (p. 26). This disorder not only stems from the ubiquity of technology but also the marginalization of environmental education (e.g., Saylan & Blumstein, 2011), the rise of standardized testing (e.g., Hursh, Henderson, & Greenwood, 2014), and teachers who feel inadequately trained or lack the time to take their students outside (e.g., Borg, Gericke, Hoglund, & Bergman, 2012; Ernst, 2014; Evans, Whitehouse, & Gooch, 2012; Kim & Fortner, 2006; Simmons, 1998). In many cases, teachers who otherwise believe in the importance of taking their students outside also feel they lack the necessary resources to do so (Ernst, 2009; Scott, Boyd, Scott, & Colquhoun, 2015). In this intrinsic case study (Stake, 1995), based at an elementary school with an ECO (Educating Children Outdoors) campus, we investigated the opportunities

and challenges faced by teachers who have access to numerous environmental education resources, including a nature trail, outdoor classroom, bird sanctuary, butterfly garden, frog habitat, and air quality monitoring station, as well as administrative support to utilize them. Data collection included surveys, interviews, and teacher observations. The participants indicated that time is a prominent obstacle. They also mentioned feeling unprepared to integrate environmental education and believing that going outside was not relevant to their curriculum. Findings reveal the importance of environmental education coursework in educator preparation programs and ongoing professional development to support in-service teachers.

SETTING THE STAGE: A STUDY OF PRESERVICE TEACHERS' INTEGRATION OF THEATRE ARTS

Caroline N. Bailey (Professor Marna Winter) School of Education

Previous studies have examined the benefits of Arts Integration for both students and teachers. This pedagogical practice has been regarded as beneficial for both students' learning and teachers' professional development. However, there is a lack of scholarship surrounding the impact of theatre arts integration on preservice teachers. This study will look at the ways preservice teachers at Elon University integrated theatre arts into their social studies instruction and the subsequent effects on their view of themselves as educators, their students' role in the learning process, and the role of arts integration as a pedagogical practice. Through surveys and interviews, four teacher candidates were observed during their internships at an Arts Integration elementary school. The results from this study suggest the power of theatre arts integration for preservice teachers. The data from this study has been used to formulate suggestions for the Elon University School of Education.

ANALYSIS OF INTERVENTIONS IMPLEMENTED IN THE CLASSROOM FOR INDIVIDUALS WITH EMOTIONAL DISTURBANCES AND A DIFFICULTY WITH INTERPERSONAL RELATIONSHIP PROBLEMS

Amanda M. Shoenfelt (Dr. Jessica Wery) Department of Education

This meta-analysis summarized and aggregated the results of single case research (SCR) on interventions used with students with emotional disturbance (ED) who had difficulty with interpersonal relationships (ED-IR). Students with social-emotional difficulties qualify to receive special education services in the category of ED. Extant SCR published in peer-reviewed journals between 1985-2015 was identified through a comprehensive search of ERIC and PsychInfo using key words: "emotion* dis* and behavior* dis*", and a hand search of likely journals. Medical interventions and interventions used with participants that were not students (e.g., teachers) were excluded. AB designs were also excluded as they have limited control of internal and external validity. The results of the studies indicated that interventions are effective, and some have more evidence of effectiveness than others. Eleven studies were identified and 52 comparisons were analyzed. Of the 52 comparisons, 17 measured academic variables (e.g., words read per minute, sounds decoded), and 35 measured behavioral variables (e.g., task engagement, disruptive behaviors). An increase in a desired behavior was measured in 18 comparisons (e.g., increase time on task), and 34 aimed to decrease undesired behaviors (e.g.,

reduce inappropriate peer interactions). The primary studies investigated the following interventions: Peer Assisted Learning Strategies, Modified Assignments, Comprehensive Reading Instruction, Individualized Curricular Modifications, Rewards, Effective Writing Instruction, Unsupervised Self Management, Dog Reading Visitation Program, High-Probability Command Sequence, High-Probability Command Sequence, Target Classroom Interventions, and Individual Contingency and Response Cost. Inter- observer agreement was 97.55%. Overall, interventions used students with ED+IR were very effective, with an overall PAND of 83.42% ($\phi=0.661$, 95% CI [0.606, 0.710]). Academic interventions (PAND=83.66%, $\phi=0.670$, 95% CI [0.603, 0.728]) and behavioral interventions (PAND=82.91, $\phi=0.632$, 95% CI [0.521, 0.723]) were similarly effective. Figure 2 shows the relative effectiveness of interventions by gender, males (PAND=82.45%, $\phi=0.676$, 95% CI [0.622, 0.724] and females (PAND=92.86%, $\phi=0.815$, 95% CI [0.59, 0.933] Figure 3 shows the relative effectiveness of interventions by grade level, elementary (PAND=80.98%, $\phi=0.616$, 95% CI [0.55, 0.675] and junior high (PAND=90.91%, $\phi=0.798$, 95% CI [0.686, 0.875]). There was not a statistically significant difference in the analysis of desired direction, and dependent variable.

Engineering

PHASE CHANGE ELECTRODE FOR NON THERMAL TUMOR ABLATION

Olivia R. Jung & Ashley L. Wenz (Dr. Christopher Arena) Department of Engineering

Irreversible electroporation (IRE) is a new method for non-thermal tumor ablation that uses pulsed electric fields (Devalos 2005). The electric pulses cause an increase in transmembrane potential that results in the formation of nanopores. If the nanopores are held open long enough, the cell dies. Heating is minimized by choosing the appropriate pulse parameters (1500 V/cm, 100 us, 90 pulses, 1 pulse/s). Because the mechanism of cell death is not based on heating, treatments can be performed next to critical nerve and blood vessels. IRE has been clinically translated to treated a variety of cancers, including locally advanced pancreatic cancer (David 2016). When treating large volumes with a single ablation, it is desirable to increase the applied electric field. It possible to cause thermal damage around the electrodes when using higher electric fields. We designed an electrode that absorbed heat out of the tissue to prevent thermal damage when treating large volumes. The electrode incorporates phase change materials (PCM) into the core to melt/vaporize during treatment. The goal was to extend the prior theoretical results (Arena 2012) on PCM electrodes for internal organ tumors by constructing a working prototype of the device. Finite element modeling program called COMSOL Multiphysics was used to optimize the geometry of the device and the physical properties of the PCM for mitigating thermal damage. Two electrodes (1.6 mm diameter stainless steel dispensing needle) were filled with gallium (99.99% pure, Gallium Source), sealed, and placed inside a beaker of ultrasound gel, which acts as a tissue phantom. These electrodes were connected to an IRE pulse generator (BTX T820, Harvard Apparatus) to deliver the treatment. A fiberoptic temperature probe (PRB-G40, Osensa) was placed near the grounded electrode. The experiment was conducted in a constant temperature incubator (28° C). Solid metal electrodes were run as controls to compare to temperature changes around the gallium filled electrodes. Pulse parameters that generated clinically relevant heating in the ultrasound gel were 99 pulses at 99 us

with 1.66 kV. Gallium's melting point (29°C) slightly above room temperature was ideal for the procedure. Specifically, the gallium core PCM electrode reduced the temperature in the ultrasound gel by a maximum of 1.5 °C. Therefore, the prototype has the potential to prevent thermal damage *in vivo* where even small increases in temperature over long periods of time can be detrimental. This warrants further design optimization and experimentation.

DESIGNING A SMART WALKER FOR OLDER ADULTS

Beth S. Lester (Dr. Scott Wolter) Department of Engineering

With an increasing percentage of our population entering the 65-and-over demographic in coming years, enhancing and promoting the autonomy of older adults is a social imperative. The development of well-designed assistive technologies can play a key role in meeting this need. We report on the development of a smart rolling mobility walker employing a user-centered design process in which users and other potential stakeholders are integral in all stages of the creation of the product. During each stage of the design process, the researcher met with older adults, some of whom used walkers and some of whom did not, and a team of retirement community administrators, physical therapists, and occupational therapists. The overarching outcome of this research examines opportunities that exist for integrated smart devices for enhanced user mobility and safety. The smart elements of the walker, prototyped using programmable microcontrollers and sensor devices, include a gyroscope that detects declination angle and passive infrared (IR) and acoustic sensors that detect user position relative to the walker. The gyroscope controls application of friction to the rear wheels by way of stepper motors to aid in safe movement when going downhill, while the IR and acoustic sensors provide feedback for safe user position using auditory and visual cues. We also report on functional changes to our smart walker including retractable seating and multi-directional folding. We focus on integrated functionality such as incline-dependent braking, reducing the need for users to manually squeeze the loop breaks when going down hill.

USE OF IRREVERSIBLE ELECTROPORATION IN DESTRUCTION OF HELMINTH EGGS IN WATER SYSTEMS

Caitlin Grace Niven (Dr. Scott Wolter & Dr. Christopher Arena) Department of Engineering

Irreversible Electroporation (IRE) is a technique that utilizes pulsed electric fields to create nanopores in lipid membranes. Historically it has been used for cancer therapy (Al-Sakere et al., 2007) and bacterial decontamination (Sale et al., 1967). Here, we investigate the potential for IRE to destroy helminths in waste water. Helminths are parasitic worms that are commonly found in dirt and water systems and when ingested by humans cause various diseases, commonly malnutrition, and can lead to death. Every year, 700,000 child deaths occur as a result of diarrhea caused by poor sanitation; chronic diarrhea can cause developmental delays due to the prevention of essential nutrient absorption and a reduction in the efficacy of life-saving vaccines (Diouf et al., 2014). Efficient destruction of parasite eggs in waste water is not possible in current treatment systems due to electrical power constraints in remote locations. By using a genetically similar model organism, *C. elegans*, in lab, experiments were run to evaluate the effectiveness of IRE. Helminths encompass a wide range of egg structures all of which have

three basic layers: protinic, chitinous, and lipoidal (Rogers, 1956). These layers are similar to those of a *C. elegans* ova. Using the membrane integrity dye propidium iodide, we have demonstrated that IRE pulses (50 μ s duration, 2000 V/cm electric field) can induce electroporation in the lipoidal layer. This process can be used to administer chemicals that kill the egg or may destroy the egg completely thus preventing the ova from developing into adults. By varying the duration and strength of each applied electrical pulse, the extent of electroporation can be controlled. Utilizing this method of sterilization will revolutionize the ways in which waste water is treated, positively impacting the environment and the health of the individuals who live in communities that do not have readily accessible clean water.

English

YOUNG PROTAGONISTS AND THE COMING-OF-AGE STORY

Jackie M. Grant (Professor Tita Ramirez) Department of English

My project explores stories about young protagonists and the process of writing long form fiction. I'm writing my first novel and I hope to better understand how to construct a narrative, specifically those focused on young characters, in which I find myself interested because of the universal nature of the adolescent experience. Through my project, I hope to answer the question: how can literary fiction about children, adolescents, or college-aged young adults be told so that they are meaningful and important to a wider audience? My research process involves examining existing work about young protagonists and adapting my writing process to fit a new form. The goal of my research is to have a complete draft by May 2017.

“ONCE MORE UNTO THE BREACH, (AGAIN)”: AN IN-DEPTH ANALYSIS OF THE REPRESENTATION OF CONFLICT IN FILM ADAPTATIONS OF SHAKESPEARE’S *HENRY V*

Charles M. Hawes IV (Dr. Megan Isaac) Department of English

Since the creation of the film industry, Shakespeare’s plays have been continually refashioned through the medium of television and cinema. They retain a host of themes and premises that are still as prevalent today as when they were first written. While the content itself remains unchanged, the way it is presented in cinema is portrayed differently depending on when and where the film is created. I have conducted research examining five different film adaptations of Shakespeare’s *Henry V* from the years 1944 (Laurence Olivier), 1960 (Robert Hardy), 1979 (David Gwillim), 1989 (Kenneth Branagh), and 2012 (Tom Hiddleston), to the end of determining how this set of films represent conflict in their portrayal of war, and what these differences indicate about the socio-political contexts of the cultural climate that each was created in. In this paper I have selected scenes with martial content and coded each film for things like the level of violence in the battle scenes, if named characters were killed in combat, and if Henry orders the execution of the French prisoners. Drawing on Gunetatne (2008), Crowl (2008), and Aebischer(2006) as scholarly examples, I have created an 18 point coding frame that, when applied to each film, produces a quantitative ranking system that reveals overall trends in the progression of the films’ level of martial depiction. In this paper, I will present

specifically on martial representation across the five films, revealing a violent portrayal of war that has grown progressively more so through the span of the sixty-eight years the films were produced. By using *Henry V* as a constant variable in research, analysis of differences among films of the same play may be a lens with which to view the cultural climate of the region and time during which they were produced.

BUILDING ENVIRONMENTAL EMPATHY THROUGH THE LANGUAGE OF POETRY

Mary A. Park (Dr. Cassie Kircher) Department of English

The aim of my research project is to promote empathy for our natural environment through the written word. My objective is to prompt a meaningful desire in readers to increase their current level of appreciation and/or interaction with nature, whether that translates to a heightened observance of their natural surroundings or an increase in their quality time spent in nature. Either way, the hope is that this increase in appreciation and/or interaction with nature will lead to an increased desire to help preserve our environment. I avoid the common route of evoking guilt and terror when addressing environmental degradation and rather seek to stimulate tenderness, love, and strength while entwining these emotions with aspects of nature. Therefore, the process consists of crafting poems that involve emotional themes to which humanity can often relate, such as family, romantic love, loss, and self-reflection, and then weaving nature into these drafts through setting, metaphor, and/or vivid description. The final result of this project is an 18-piece poetry collection that connects deep-rooted emotion to the natural world in a positive manner, and I intend to both explain this intention and read selections of my work at SURF.

GOTHIC FEMINISM: FROM LITERATURE TO SLASHER MOVIES

Anna C. Richards (Dr. Scott Proudfit) Department of English

This research addresses a wave of feminism in the gothic tradition from the 1960s through the 1990s, by detailing the influence of Angela Carter's "The Bloody Chamber" on the literary gothic, and the similar influence of Wes Craven's *Scream* on the slasher film genre. Analyzing the two media leads to a deeper understanding of this late 20th century revision, as horror films may be read as a continuation and byproduct of gothic literature. While the gothic traditionally depicts violence, especially against women, these two creators have encouraged a movement to reimagine the role of women within gothic narratives. Through close reading, this paper examines how both Carter and Craven work within traditional gothic frameworks while introducing modifications that question and critique the treatment of women within their chosen genre. The gothic relies heavily on established conventions from traditional fairy tales and stories, many of which were cautionary tales designed to justify a patriarchal society, therefore the disruption of these "rules" is significant. Following fairy tales however, the gothic literary tradition has often been associated with feminism or proto-feminism. The modern gothic's progenitors were often women: Mary Shelley, Charlotte Bronte, Flannery O'Connor, among many others. Carter and Craven's works build on this foundation and have influenced many others as early adopters of this "new feminist" gothic. The paper employs Simone De Beauvoir's The Second Sex and Laura Mulvey's article "Visual Pleasure and Narrative Cinema" to establish

a feminist theoretical framework through which to explore this issue. Ultimately, the research concludes that while these works do not eliminate violence against women from gothic narratives, they frame it in a way that allows their female characters to triumph over the genre's traditional sexism.

“FOR WHOM IS THE FUNHOUSE FUN?” : THE INFLUENCE OF JOHN BARTH’S “LOST IN THE FUNHOUSE” ON DAVID FOSTER WALLACE’S “WESTWARD THE COURSE OF EMPIRE TAKES ITS WAY”

Mary C. Sheehan (Dr. Daniel Burns) Department of English

In his innovative short story “Westward the Course of Empire Takes its Way,” David Foster Wallace improbably humanizes the self-conscious aesthetics of his most influential literary precursor, the postmodern author John Barth. Eliciting both admiration and a self-conscious rivalry in the younger author, Barth’s famous short story, “Lost in the Funhouse” is a foundational example from the metafiction genre and one Wallace found an irresistible model for his career-long quest to collapse textual boundaries between author and reader. Following this logic, my research asks to what extent Wallace’s “A Westward the Course of Empire Takes Its Way” is a departure from or a nod to Barth’s earlier story. This question is imperative in the study of metafiction in the field of English literature, as Barth is referred to as the father of metafiction, and Wallace is one of his most important contemporaries. In order to understand this tension between Wallace and Barth’s metafiction, I contextualized both short stories with both narrative theory and biographical lenses. Indeed, the most important question Barth asks his readers is, “for whom is the funhouse fun?” (Barth, 1968), which might be rephrased as “for whom is reading metafiction fun?” My research attempts to answer these questions through close readings of these stories informed by biographical information. In conversation with critics such as Charles B. Harris, the major departure from Barth’s fiction is that Wallace communicates directly with the reader, allowing an exit from the funhouse metafiction has created. I have concluded that Wallace’s metafiction is a departure from Barth, as it is more empathetic in the bond it creates between the reader and author. Wallace concludes “Westward...” with the compassionate phrase, “you are loved” (Wallace, 1989). According to Wallace, the funhouse of metafiction is fun for readers, because they have established a loving and trustworthy bond with the author.

ETHOS OF AN EDITOR: RHETORICAL PRACTICE AND LEARNING OF STUDENT NEWSPAPER COPY EDITORS

Hannah K. Silvers (Dr. Rebecca Pope-Ruark) Department of English

This project investigates how copy editors at Elon University’s student newspaper learn to be “good” copy editors and what that means to them. The group of copy editors who work together in person each week — called the copy team — can best be understood as a community of practice (Wenger 1998). As such, this project investigated their learning process as a process of legitimate peripheral participation (Lave and Wenger, 1991). Four copy editors acted as participants during their first semester on the copy team. Data was collected by triangulating ethnographic observations, written text (pages participants copy edited and surveys they

responded to before and after legitimate editing tasks), and text- and discourse-based interviews. An emergent coding system was employed to analyze data, and a training program for new copy editors as well as a thesis discussing the theoretical implications of the analysis were produced. Preliminary findings indicate that to be an expert in the community of practice of the copy team, new copy editors don't just have to learn a set of editing skills. Instead, they learn to actually be a new type of person: an expert copy editor. They learn the skills and mindsets that characterize an expert copy editor — and when and how to employ those skills and mindsets — through engaging in legitimate tasks, on paper and out loud, in person with expert copy editors. This process of learning to become a “certain type of person,” as one participant put it, was identified as a process of embodying the ethos of the community of practice (Halloran, 1982; Smith, 2003; Reynolds, 1993; Corder, 1989). This new connection between legitimate peripheral participation and embodying an ethos opens the way for nuanced understandings of each rhetorical theory as well as new ways to explore and encourage growth in writing in close-knit, writing-based communities of practice.

Environmental Studies

EXPLORING SENSE OF PLACE IN ADOLESCENTS: A QUALITATIVE APPROACH

Laura A. Todd (Dr. Scott Morrison) Department of Environmental Studies and Department of Education

This research aims to explore what motivates adolescents to become environmentalists. Previous studies have demonstrated that time spent in nature and the presence of an influential adult are among the most significant life experiences that motivated both the children and adults studied to become environmentalists (Chawla, 1999; Chawla & Cushing, 2007). Time spent in nature, particularly in specific places, drives the development of sense of place. It is a facet of the human-nature relationship that asserts that people are more motivated to protect places with which they have personal and meaningful relationships. (Ardoin et al. 2012). There is limited research, however, on younger environmentalists and the degree to which their sense of place shapes their values and behavior. Participants in this study adolescents that are diverse both racially and in terms of gender and are between the ages of 12 and 19. Participants were purposively recruited based on having experiences in summer environmental programs across North Carolina, charter schools with explicit environmental focuses, or extracurricular activities related to environmentalism at public schools. Twenty-eight participants completed a survey that was distributed through their respective organizations. The survey included questions regarding demographic information as well as the Nature Relatedness Scale (Nisbet, Zelenski & Murphy, 2009), which measures an individual's connection to nature. In the survey, participants voluntarily selected whether or not they would be willing to participate in a subsequent interview. Seven adolescents have been interviewed thus far, with more interviews being conducted in spring of 2017. Interviews lasted approximately 45 minutes and contained questions that were semi-structured and open-ended. Preliminary findings suggest that the motivating factors that drive adolescents to become environmentalists differ from the previous literature published regarding the motivating factors of adults and children. The influence of peers, emotional ties to the environment, school, and a lack of connection to home in addition to

increased mobility all affected the way in which participants formed their connection to nature and developed their disposition towards the environment.

ANALYSIS OF NUTRIENT UPTAKE BY GENUS *CUSCUTA*

Stephen J. Feely (Dr. Brant Touchette) Department of Environmental Studies

Genus *Cuscuta* is a universally grown holoparasite that forms a non-symbiotic relationship with a host plant of similar anatomic structure by invading the vascular tissue of the host organism. Upon entering the vascular tissues, the *Cuscuta* dissolves its root system and becomes completely interdependent on the parasitized host. By tapping into the vascular tissues of the host, the parasite is able to absorb the water, macronutrients, and micronutrients it needs to survive. Despite this knowledge, the specific quantity of each basic nutrient that is absorbed and subsequent effects on surrounding community are unknown due to a lack of research on this parasite. After collecting samples, examinations of the external anatomical characteristics of the host plant were performed to measure symptoms of nutrient-deficient induced stress. By measuring leaf surface area, quantity of prominent stems, and shoot length, we can determine if the host plant is displaying any signs of stress when compared to the anatomical properties of the control plant that was not parasitized. After taking morphological data, the samples were dried and weighted to determine dry mass. Once all biomass recordings were completed, both the soil and tissue samples were sent for mineral analysis (conducted by the NC Department of Agriculture), where the quantity of nutrients in the soil, control, host, and parasite samples were analyzed. Preliminary data analyses suggest that host plants, in some cases, have elevated nutrient levels compared to the non-parasitized control. While this was unexpected, we hypothesized that the parasite is fostering greater water movement through the soil-host-parasite continuum allowing certain minerals to build up in host leaves.

AN EXAMINATION OF THE SMALL MAMMAL COMMUNITY OF AN OLD FIELD HABITAT, WITH AN EMPHASIS ON THE MOVEMENT PATTERNS OF THE HISPID COTTON RAT

Mollie Flowers (Professor Patricia Thomas-Laemont) Department of Environmental Studies

This research is an examination of the small mammal continuity of a field habitat, with emphasis on movement patterns of the hispid cotton rat (*Sigmodon hispidus*). Native prairie habitat is rapidly being converted for agricultural use; however, this habitat remains important for dozens of native species. Small mammal species like the hispid cotton rat. Hispid cotton rats have an integral role within the field habitats; they interact with other small mammals, such as shrews and various species of mice, as well as having a role in food chain interactions. Loy Farm was chosen for observation for the presence of native tallgrass prairie habitat as it is early successional habitat of piedmont prairie. Hispid cotton rats are the primary subjects of this study because they have already established successful residency, represent an important level of the local food web, and are relatively understudied for the area. Other small mammal species found included house mouse (*Mus musculus*), white-footed mouse (*Peromyscus leucopus*), and southern short-tailed shrew (*Blarina caroliniensis*). Home range and movement pattern data was collected by using mark-recapture over a 90x100M area from October 2016 to March 2017. The

primary capture location and subsequent movements of the individual gives an idea about home range size and shape, as well as possible determining factors. These determining factors include species, sex, and sexual maturity. Information collected included species, relative age, sex, sexual maturity, as well as length and weight. Individual behavior and population numbers of hispid cotton rat were analyzed for trends based on this data. Home range diagrams were constructed based on recapture information collected. Preliminary data yielded 62 individuals tagged, with two house mice, two shrews, and five white-footed mice caught. Hispid cotton rats had an average home range of 343.75 m²; with a 211.11m² average for females and 491.67 m² for males. This was of 9 individuals of each sex. These results are indicative of possible trends within the population, but further data needs to be collected to draw accurate conclusions. Data like this can help scientists better understand populations of hispid cotton rats and other small mammals of this area.

CORRELATES OF DUNG BEETLE INTRODUCTION TO AUSTRALIA

Cassidy E. Levy (Dr. Amanda Chunco) Department of Environmental Studies

Exotic species are a major problem in conservation ecology, but a lack of data on the process of species introductions makes them difficult to study on a multispecies scale. One exception to this is the purposeful introduction of 43 species of dung beetles to Australia between 1968 and 1984, of which 23 species established exotic populations. The goal of our research was to model the native and exotic Australian niche for 9 of these introduced dung beetle species to assess whether each species' ecological niche affected its ability to establish exotic populations in Australia. Specifically, we examined if the degree of similarity between the native and exotic niches predicts a species' success in establishing populations where introduced. We used species records from the Global Biodiversity Information Facility and iDigBio online databases, environmental data from Worldclim and the Global Harmonized Soil Database to model the native niche for each species using Maxent software, and compare this to where the beetles were introduced. The similarity between the native and exotic niches was examined using Principal Components Analysis in R. Preliminary model results suggest introduced niche conservatism is consistent with our hypothesis that species with more similar niches had higher establishment success. These results may help explain how species' niches can influence introduction success, which could aid conservation efforts by helping identify regions at risk of future invasions and areas where purposeful introductions might succeed.

REUSE OF IMPAIRED WATER THROUGH A MULTITROPHIC SUSTAINABLE ECOLOGICAL MACHINE

Joseph B. Meko (Professor Steve Moore) Department of Environmental Studies

The current trend in modern sustainability has placed little focus on the the localization and reuse of waste and waste treatment. Specifically, the reuse and treatment of domestic wastewater merits further investigation as a means to promote water, food, and energy sustainability. This paper serves as a review and synthesis of ecological machines, an alternative wastewater treatment system. Ecological machines are anthropogenically constructed ecosystems that capitalize on biological diversity to provide ecosystem services. A review of 56 case studies and

examples was undertaken and revealed that these systems have demonstrated the ability to treat domestic wastewater up to tertiary standards using a biological systems approach. While based on three primary designs for wastewater treatment, each ecological machine contains unique variations depending on climate, location, and function. Further investigation reveals little has been done in researching additional beneficial system outputs such as food, energy, and oxygen. Based on the review, variations of ecological machines are noted for best practice methods. Limitations of current systems are addressed, and discussions are presented on the utilization of wastewater to produce beneficial system outputs as well as additional uses for reclaimed domestic wastewater. Synthesis of current knowledge and best practices culminates in a proposed ecological machine for use in the new science center at Elon University, Elon NC.

FIGURING THE FATE OF *S. BOMIFRONS*: CAN SOUTHERN POPULATIONS OF THIS SPECIES WITHSTAND CLIMATE CHANGE?

Emma M. Nault (Dr. Amanda Chunco) Department of Environmental Science

Climate change is causing changes in the distribution (from range shifts to extinction) of many species of plants and animals. Predicting the responses of these populations is crucial to conservation. Species distribution modeling (SDM) is one method for studying past, or predicting, future responses to climate change. SDMs use environmental data (past, current, or future projections) and locality data to map habitat suitability. This study used SDMs to study drivers of range disjunction and response to climate change in the plains spadefoot toad (*Spea bombifrons*). It features an isolated population in southern Texas separated from a central population by over 643 kilometers. All population spatial data was aligned and imported into Maxent (ver. 3.3.3.k), the niche modeling software predicts the range of *S. bombifrons* in three different time periods (6kbp, 1950-2000, and 2050 spatial data). Global climate data was compiled and included 19 continuous, bioclimatic variables (temperature, precipitation, etc.). The study asks: what is the likelihood of range shift versus extinction due to climate change for this isolated population of *S. bombifrons*? Results project the isolated, southern Texas habitat for *S. bombifrons* will be unsuitable by 2050; whereas the central population will follow a range shift. The central population's preferred habit will occur in more northern regions.

DIURNAL CHANGES IN QUANTUM YIELD IN AQUATIC AND WETLAND PLANTS

Gisele P. Nighswander, Samantha McCabe, & Mariana Kneppers (Dr. Brant Touchette)
Department of Environmental Studies

Wetlands are among the most important ecosystems in the world with their extensive biodiversity, complex trophic interactions, and high productivity. Additionally, they are distinguished by their possession of both terrestrial and aquatic components. Because of this, wetlands are difficult to define; however, they typically maintain three characteristics (*i.*) the presence of hydrology, (*ii.*) periodic soil saturation, and (*iii.*) the presence of vegetation adapted to surviving these conditions. Perhaps the most important component of wetlands is the presence of flood tolerant plants, or hydrophytes. Wetland plants are accustomed to enduring prolonged periods of flooding and soil anoxia without experiencing appreciable amounts of stress. Chlorophyll *a* fluorometry has been used as an important tool to detect physiological stress in

plants, however its application in stress studies on hydrophytes is limited. This study seeks to examine chlorophyll *a* fluorescence, specifically quantum yield (QY), as an environmental stress indicator. There are two types of QY, (i.) potential QY, a measure of a dark-adapted plant's maximum capacity to transfer electrons past Photosystem II, and (ii.) effective QY, a light-adapted plant's capacity to transfer electrons past Photosystem II. Both potential and effective QYs were studied in three different wetland plant species, *Sagittaria latifolia*, *Ludwigia peploides*, and *Eleocharis quadrangulata*. These values were evaluated diurnally along with different environmental parameters, the purpose of this was to consider: (i.) the temporal variations in chlorophyll *a* fluorescence and (ii.) which environmental factors corresponded with changes in fluorescent outputs. By using correlation analysis, we seek to characterize which factors, such as photosynthetically active radiation (PAR), air temperature, plant surface temperature, vapor pressure deficit (VPD), stomatal conductance (*g*), and leaf water potential, are the main drivers behind variations in QY. The results suggest that some of the strongest drivers across all three species appeared to be temperature (both plant surface and air) and VPD. We suspect that these parameters reflect relatively insufficient regional water conditions around the photosynthetic apparatus in these plants resulting in decreased photosynthetic performance when both temperature and VPD were high.

GLEN RAVEN DISASTER RELIEF SHELTER: GARDEN DESIGN & LOGISTICS

Samuel M. Shantry & Lindsay A. Seventko (Professor Michael Strickland) Department of Environmental Studies

This report addresses the design of the garden component of the Glen Raven disaster relief shelter, which was an idea originating in Glen Raven, Inc.'s philanthropic division. The concept of the disaster relief shelter is that of a mobile hub which will contain living and recreational areas, as well as a source of renewable energy, potable water, and fresh-grown food. This report is a continuation of the research previously completed during the Fall 2016 class of ENS 461, during which a team of Elon students produced a 3-D model of a hydroponics garden design. Through review of existing literature, expert consultation, blueprinting, and prototyping, we assessed and amended most of the garden design concepts from the previous semester, resulting in a more streamlined design. The product is a hydroponic grow wall that will stretch along the side of the disaster relief shelter (24 feet long, and 6 inches wide) operating using aeroponic technology. It has the capability to grow everything from lettuces and herbs to heavier fruiting vegetables such as zucchini, tomatoes, and strawberries with minimal water waste, while operating off of sunlight rather than artificial light. This is a unique design for two reasons: it emphasizes the utilization of Glen Raven materials (Stratabase, Aqualon Edge, and Commercial 95340) in the construction of the garden, and it can be assembled and disassembled without expert knowledge or power tools. We designed, prototyped, and tested our own misting towers to inform and ensure ideal misting radius, tower spread and pump location. We also creatively selected materials to keep the total estimated cost below \$1200. The result is real estate to grow 230 plants on the grow wall, plus 12 horizontal feet of space for planting vining and fruiting crops. The complete inventory list and detailed cost estimates are included in the report, along with recommendations for building, transporting, and assembling the shelter.

GROWING HEALTHY HABITS: POSITIVE EFFECTS OF COMMUNITY GARDENS

IN LOW-INCOME HOUSING NEIGHBORHOODS

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The eight residential communities of the Burlington, NC Housing Authority (BHA) are food insecure, meaning that they have limited access to markets and grocery stores. To address food insecurity, my 2-year community garden project intended to give BHA residents in Crump Village and Willow Creek neighborhoods the tools to live healthier lifestyles and to build a strong community dynamic. Willow Creek houses an elderly population, many of whom have physical disabilities or chronic illnesses. Although many residents in Willow Creek have a rural, agricultural background and grew up eating vegetables, their age, environment, socioeconomic status, and physical disabilities too often inhibit them from doing so at the BHA. Crump village, on the other hand, is home to many single mothers and children, who have grown up eating fast food and often do not know the value of eating fresh vegetables. To address these issues, my project built community gardens in Crump Village and Willow Creek, giving residents a place to congregate, work together and harvest fresh food. In addition, we have implemented cooking and nutrition classes for adults, and after-school gardening and nutrition activities for children. This project's goals include establishing a plan for the long-term viability of the gardens, and assessing the potential positive lifestyle impacts of these programs among residents. While fostering a widespread feeling of community ownership of the gardens has proven difficult, we've made much progress; improvements in both physical activity and dietary change has been measured. Although much needs to be done to insure program viability after my project ends at graduation, our success story from breaking ground and constructing beds, to holding dinners with innovative, nutritious recipes of home grown food suggest a model that can be replicated at many similar sites.

Exercise Science

EFFECT OF MEDITATION ON ENDURANCE PERFORMANCE

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Meditation is used to promote concentration, relaxation, focus, attention, and reduced state anxiety (Kabat-Zinn et al., 1992). Although research has generally accepted that meditation significantly improves psychological health and cognitive task performance, there is very little research addressing the impact of meditation on aerobic activity. In particular, Hatha Yoga and Omkar Meditation were found to be beneficial in increasing endogenous secretion of melatonin, corresponding to a greater sense of well-being during exercise, as well as an improved cardiovascular efficiency and homeostatic control of the body (Harinath et al., 2004). This suggests that regular engagement in meditation practice can have beneficial effects on mental feelings of well-being and overall performance during exercise. Therefore, the purpose of this research is to determine if regular meditation can positively affect performance on an exercise test to exhaustion. Participants ($n = 30$) will be recreational runners who have completed a 5k or 10k in the past 6 months. They will be randomly assigned to either an intervention or control condition. They will complete a run to exhaustion before and after the 10 day intervention. The

intervention group will do 10 minutes of meditation a day using the Headspace app™ on their phone. The control group will do 10 minutes of gaming a day using the Angry Birds app on their phone. Affect will be measured with the feeling scale and the felt arousal scale before, every 5 min during, and following the run to exhaustion. Ratings of perceived exertion and heart rate will be measured every 5 minutes during the run to exhaustion. Total time of each run to exhaustion will be recorded. Participants will complete the physical activity enjoyment scale 15 min following each run to exhaustion. It is expected that the time to exhaustion following the meditation will be longer than that following the control. It is unclear what impact the meditation will have on affect, perception of exertion, heart rate, and enjoyment, but we are hoping to observe increases in affect and enjoyment and decreases in perception of exertion and heart rate following the meditation intervention.

INFLUENCE OF SELF-PERCEPTIONS ON AGGRESSION IN SPORT IN COLLEGIATE CLUB ATHLETES

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An athlete's perceived risk of injury has a negative correlation with self-efficacy (Malhotra et al, 2012). Furthermore, a decrease in self-efficacy has been shown to decrease athletic performance and increased aggression in sport (Short et al, 2004). Previous research has found that lower feelings of control and autonomy (Chantal et al., 2005) and higher levels of frustration and confidence (Shapcott et al., 2007) influence hostile aggression in women ice hockey players.

PURPOSE: To determine if an athlete's perceived risk of injury effects their aggression in a sports environment. **METHODS:** 25 male and female collegiate club rugby athletes (19-22 years, 16 Males and 9 Females; 20.0 ± 1.1 years) underwent a single session where they were asked to complete a packet of questionnaires composed of a demographic questionnaire, the Bredemeier Athletic Aggression Inventory (Bredemeier, 1975) was used to measure instrumental and reactive aggression, Rosenberg's Self Esteem Scale (Rosenberg, 1965) to assess self-esteem, Athletic Fear Avoidance Questionnaire (Dover & Amar, 2015) to measure fear avoidance, and Ryckman Physical Self-Efficacy Scale (Ryckman et al., 1982) to assess perceived physical ability and physical self-presentation. **RESULTS:** Preliminary analysis shows athletic fear avoidance did not correlate with any measures of self-perceptions or aggression. Additionally, no measures of self-perceptions correlated with reactive aggression. However, instrumental aggression was significantly related to physical self-presentation ($r = -0.35$). Additionally, length of sports participation correlated with reactive aggression ($r = -0.36$) and instrumental aggression ($r = 0.20$). **CONCLUSION:** The only significant finding from the model was that instrumental aggression was significantly correlated with physical self-presentation, but most of the correlations were stronger with instrumental aggression than reactive aggression. These are preliminary findings with a small sample size. Future research will also investigate these relationships other sports.

AFFECT RESPONSES TO AN ACUTE BOUT OF RESISTANCE EXERCISE THE MORNING AFTER CONSUMING A NIGHTTIME PROTEIN SUPPLEMENT

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PURPOSE: To determine changes in affect in response to an acute bout of resistance exercise (RE) the morning after consuming two different proteins, whey (WP) and casein (CP) and a non-caloric placebo (PLA) when consumed before sleep. If proven to be beneficial, this supplementation could increase exercise adherence in a general population. **METHODS:** Twelve physically active men (age, 21.6 ± 1.9 yrs) and women (age, 25.2 ± 6.3 yrs) participated in this randomized, double blind, crossover study. A single dose of 24g WP, 48g WP, 24g CP, 48g CP, or PLA was consumed 30 minutes prior to sleep. Prior to and immediately after RE, Activation Deactivation Adjective Check List was used to measure Energetic Arousal (EA) and Tense Arousal (TA), Feeling Scale (FS) to assess affective valence, and Felt Arousal Scale (FAS) to measure perceived activation. RE was performed at a metronome cadence of 30bpm for 2 sets of 10 repetitions and 3rd set to failure at 60% of 1-RM for each exercise. **RESULTS:** Energy, tension, and arousal increased in all conditions after performing an acute bout of resistance exercise (RE). There was no significant change in FS observed, while in the FAS a significant time effect was seen, however, there was no significance observed by condition or time by condition. **CONCLUSION:** There were no significant differences seen in FS, while energy, tension, and arousal can all be increased following RE in the morning by ingesting 24g & 48g of WP and CP as well as PLA before bed. Further research may explore the effects of different types of supplements as well as timing of supplement consumption and the impact it may have on energy, tension and arousal.

EFFECT OF DUAL-TASK AND NEUROCOGNITIVE FUNCTION ON TURNING CHARACTERISTICS AMONG COLLEGIATE ATHLETES

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Many sports require athletes to complete turns during competition. While many studies have examined spatio-temporal gait parameters both with and without a concurrent cognitive load, there is little information on the turning characteristics while walking and performing a concurrent cognitive task. Such information could help evaluate the effects of concussion on an activity of daily living like turning while walking. **PURPOSE:** To determine the effect of dual-task and neurocognitive function on turning characteristics while walking in collegiate athletes. **Methods:** 53 subjects performed 5 trials of a 10m walk under single- and dual-task conditions at self-selected speed. Each trial consisted of one turn. The Mini Mental Status Exam (MMSE) was used as the concurrent dual-task. MMSE consists of spelling five-letter words in reverse, subtraction by sevens, and reciting the months of the year in reverse order. . ImPACT (Immediate Post-Concussion Assessment and Cognitive Test) was used to measure cognitive function Participants were fitted with 6 OPAL sensors as part of the Mobility Lab system (APDM Inc., Portland, OR). The trunk or lumbar sensor and a mathematical model developed by APDM was used to detect the exact moment of beginning and end of turning. Absolute and variability measures of turning velocity and duration were calculated. Number of steps during turning were also obtained. A paired samples t-test and Wilcoxon Signed Rank test were used to compare turning performance under single and dual task conditions. **Results:** Significant differences were found between both velocity and duration when completing a dual task. Additionally, variation was found between walking speed and levels of neurocognitive function.

Conclusion: Athletes turned significantly slower and took longer time to complete the turn while dual-tasking albeit taking similar number of steps to complete the turn. Whether these results hold true for post-concussion evaluation needs to be determined.

EFFECT OF FOOT PLACEMENT ON VERTICAL JUMP GROUND REACTION FORCE

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Dancers and athletes frequently perform jumps from a variety of positions involving various foot placements. There is ample literature on turnout in dancers, the kinematics of vertical jumps, muscle activation, and ground reaction forces. However, foot placement has not been widely researched with regard to vertical jumps. The purpose of this study was to examine the effect of foot placement on force production during a vertical jump in dancers and athletes. Eleven experienced jumpers (six dancers, five athletes) consented to participate. Participants stood on force plates with feet parallel and shoulder width apart establishing position A. Tape marks were used to indicate exact placement of the big toes and heels. Participants were instructed to rotate both feet outward as far as comfortably possible while keeping heels on the tape marks. Big toe positions were marked establishing position C. Participants stepped off the force plates to perform a self-guided warm up while a goniometer was used to measure and mark the midpoint between big toe positions A and C. This midpoint was position B. Following warm up, participants returned to the force plates and performed five maximal vertical jumps in each position. The order of positions was randomized with a three minute rest period between positions. Vertical ground reaction forces (GRF) were recorded and averages calculated for each participant in each position. Values were normalized to body weight and a 2x3 ANOVA was used to analyze data. Athletes generated significantly greater GRF than dancers ($p=0.012$). However, there were no differences based on foot placement and no interactions. Athlete GRF were 1.29 times body weight compared to 1.08 for dancers. This could be a result of athletes using countermovement muscle contractions prior to jumping whereas dancers are trained to jump with a focus on aesthetics instead of maximum height and force production. Further data analysis could be done to analyze countermovement jumps with side video recording of testing. Additionally, placing greater focus on jumping and landing in the same position to eliminate loss of force in X and Y direction would be beneficial.

RESTING ENERGY EXPENDITURE, BODY COMPOSITION, PHASE ANGLE, MUSCULAR STRENGTH, DIETARY INTAKE AND PHYSICAL ACTIVITY IN BREAST CANCER SURVIVORS AND HEALTHY AGED MATCHED CONTROLS

Caroline D. Deaterly & Emily H. Harrison (Dr. Titch Madzima) Department of Exercise Science.

Breast Cancer Survivors (BCS) often face negative changes in body composition such as increased fat mass, decreased lean body mass, and decreased bone mineral density (BMD) (Sheean et al., 2012). These changes can be attributed to treatment, lack of physical activity, and diet (Sheean et al., 2012). Phase angle, determined by bioelectric impedance analysis (BIA) can

be used as a prognostic tool for morbidity and mortality (Stobaus et al., 2010). A phase angle less than 5° is associated with lower nutritional status and cellular health (Stobaus et al., 2010).

Purpose: To evaluate the differences in resting energy expenditure (REE), body composition, phase angle, muscular strength, and diet in BCS compared to healthy age matched women (HC). **Methods:** Fourteen post-menopausal BCS (stages 0-III) (age: 59 ± 8 yrs; BMI: 26.1 ± 5.5 kg/m²) and nine HC (age: 61 ± 6 yrs; BMI: 25.3 ± 3.9 kg/m²) were recruited. REE was measured for 35 minutes via indirect calorimetry. Body composition and Phase angle were measured via dual energy x-ray absorptiometry and BIA. Upper and lower body strength was measured via one-repetition maximum strength tests on the chest and leg press. Dietary intake and physical activity levels were evaluated for seven days via the smartphone application, MyFitness Pal® and the Fitbit Alta™, respectively. Data were analyzed via one-way ANOVA. Significance was accepted at $p < 0.05$. **Results:** There were no significant differences in REE, body composition, phase angle and dietary intake between BCS and HC. BCS had significantly lower upper body strength compared to HC (31.1 ± 10.1 kg vs. 43.2 ± 8.9 kg; $p < 0.05$). BCS also had significantly lower physical activity levels (6851 ± 1923 steps/day) compared to the HC (11025 ± 3707 steps/day; $p < 0.05$). Only the left femur BMD was significantly lower in BCS compared to HC (0.84 ± 0.09 g/m² vs. 0.93 ± 0.09 g/m²; $p < 0.05$). **Conclusion:** While strength and physical activity levels were different, BCS in the present study had similar REE, body composition, phase angle and dietary intake to HC. It can be concluded that treatment for breast cancer diagnoses have a significantly negative effect on strength and physical activity in BCS.

REGULATING PLEASURE DURING EXERCISE: IMPACT ON EXERCISE ADHERENCE

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Affect-based exercise prescriptions have been used to facilitate feelings of pleasure during exercise. It has been proposed that using this type of exercise prescription may increase exercise adherence by preventing feelings of displeasure commonly experienced during exercise. However, typical exercise guidelines continue to be grounded in intensity-based exercise recommendations that do not take into account how people feel during exercise. **PURPOSE:** To compare the impacts of an affect-based exercise prescription using the Feeling Scale (FS) to an intensity-based exercise prescription using the Rating of Perceived Exertion Scale (RPE) on exercise adherence. **METHODS:** Participants were assigned to an FS ($n = 26$) or RPE prescription ($n = 23$) for a 6-week exercise intervention consisting of at least 30 minutes of cardiovascular exercise on at least 3 days per week. The FS prescription required participants to adjust their exercise intensity so they always felt 'good' during exercise. The RPE prescription required participants to adjust their exercise intensity so they always felt that they were working 'somewhat hard' during exercise. Exercise participation was assessed using 1-week self-report activity logs during and at 1 and 3 months following the 6-week intervention. **RESULTS:** Minutes of exercise for the FS and RPE groups varied during and at 1 and 3 months following the intervention: FS = 128.8 ± 44.1 min, 90.2 ± 82.7 min, & 61.3 ± 69.6 min; RPE = 113.7 ± 19.2 min, 98.0 ± 73.1 min, & 41.5 ± 59.3 min. Additionally in the FS group 77% completed the 6 weeks, 62% reported exercise at 1 month, and 46% reported exercise at 3 months. In the RPE group, 65% completed the 6 weeks, 39% reported exercise at 1 month, and 22% reported exercise at 3 months. **CONCLUSION:** Three months post-intervention, more participants in the

FS group reported exercise, and they completed more minutes of exercise per week. Drop-out rate was lower for the FS group across all time points. Results indicate that affect-based exercise prescription using the Feeling Scale may facilitate increased exercise adherence. Further research is therefore necessary to determine the long-term impact of FS as a tool to enhance exercise adherence.

COMPARISON OF THE EFFECTS OF SELF-SELECTED AND PRESCRIBED INTENSITY EXERCISE ON EXERTION AND FEELING

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Physical inactivity results from low initial engagement and high dropout, both of which should be considered when prescribing exercise prescriptions. Traditional exercise prescriptions do not address how people feel during exercise, which contributes to low initial engagement and high dropout rates. Self-selected exercise may provide an exercise prescription that accounts for people's feelings during exercise and that causes physiological benefits and positive affective responses to exercise. This type of exercise prescription may increase exercise adherence. This research seeks to determine if participants rate exercise intensity as more enjoyable when permitted to self-select rather than when the intensity is prescribed to them. Twenty-three healthy (13 females) participants (age = 20.9 +/- .55) completed a graded exercise test, a self-selected exercise session, and a prescribed intensity exercise session, all on a Lode recumbent bicycle. Each session was separated by 48 hours. During exercise, perceptions of exercise were recorded using the Ratings of Perceived Exertion (RPE), Feeling Scale (FS), and Felt Arousal Scale (FAS). Following each test, participants rated their enjoyment of the session using the Physical Activity Enjoyment Scale (PACES). The intensity of the prescribed intensity session was identical to the self-selected condition, although participants were not aware of this. A 2 (day) x 5 (time) repeated measures ANOVA was conducted. For RPE, there was a significant time main effect $F(4, 44) = 12.60, p = 0.001$. For FS, there was a significant condition main effect, $F(1, 22) = 6.76, p = 0.016$, and a significant time main effect, $F(4, 88) = 11.12, p < 0.001$. For PACES, a one factor repeated measures ANOVA revealed a significant effect of condition, $F(1, 22) = 5.02, p = 0.035$. Thus, when participants were able to self-select their intensity, they felt better throughout and reported greater enjoyment after the exercise session when compared to an identical prescribed intensity. This would suggest that self-selecting intensity might lead to increased adherence in the future.

SPORT-RELATED STROBE GLASSES TRAINING FOR VISUAL SPEED AND PROCESSING ENHANCEMENT

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Visual training is an understudied area that shows great potential to affect musculoskeletal injury risk after an individual has sustained a concussion. Strobe glasses, which flash and briefly occlude one's vision, are an example of such a training device that can be used while executing sports-specific training. This training method could be employed to improve the visual acuity of athletes post-concussion. The purpose of this study was to examine if a short-term, sports-related

visual training program with the use of strobe glasses can significantly improve athletes' visual acuity. Seven student-athletes were put through a two-week visual training program comprised of eight separate 20-minute training sessions. Both the experimental group (n=4) wearing the strobe glasses and the control group (n=3) not wearing the glasses caught 50 footballs per session from a Juggs football-passing machine facing forward and from each side. Every two sessions, the training got increasingly more difficult by moving the athlete closer to the machine and decreasing the strobe frequency of the glasses for the experimental group (starting at level 1- fastest frequency- and ending at level 3 out of the 7 possible frequencies). A baseline King Devick test and Immediate Post-Concussion Assessment and Cognitive Test (ImPACT) were given to each athlete before training began in addition to after completion of the training. The control group's mean baseline King Devick score (35.09 ± 10.3 seconds) did not improve post-training (35.9 ± 8.2 seconds; $p = 0.59$). The experimental group's mean baseline King Devick Score (40.7 ± 10.4 seconds) improved post-training (36.1 ± 7.6 seconds). No significant changes were observed for either group regarding the visual parameters measured on the ImPACT test. These results show that the vision-training program employed using the strobe glasses does have a slight positive effect on King Devick score compared to the control conditions, which could help lead to a vision training program aimed at lowering the musculoskeletal injury risk of athletes with lower visual acuity.

THE EFFECTS OF BALANCE TRAINING AND RESVERATROL SUPPLEMENTATION ON STABILITY

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Daily balance training leads to increases in stability (Clemson et al., 2012). It has also been suggested that dietary practices, such as consuming resveratrol may support balance by enhancing neuromuscular function (Lin et al., 2014; Timmers et al., 2011). What remains to be investigated is the impact of balance training and resveratrol supplementation on stability. **PURPOSE:** To examine the effects of a 10-week balance intervention in combination with resveratrol supplementation on stability in healthy females. **METHODS:** This study was a 10-week, double-blind design. Twenty-two college-aged women completed this study. They were randomly assigned to either a 250 mg resveratrol group (RES) or a placebo group (PLA). Participants took one capsule daily and participated in a home-based balance training 5 times/week. Participants completed 3 testing sessions (pre-training (PRE); 5 weeks into training (MD); and after 10 weeks of training (PST)). During all 3 sessions, stability was assessed in both rested and fatigued states by the Static Postural Stability Test on a Biodex Balance System. During each session, stability was measured, fatigue was induced using a Biodex System 4 isokinetic dynamometer, and then stability was assessed again. Gain scores were calculated for the purposes of analysis. **RESULTS:** A repeated-measure GLM revealed no significant differences ($p > .05$) for condition or time (PRE: RES: -0.06 ± 0.11 ; PLA: -0.25 ± 0.17 ; MD: RES: 0.02 ± 0.03 ; PLA: -0.15 ± 0.10 ; PST: RES: -0.24 ± 0.05 ; PLA: -0.36 ± 0.11). **CONCLUSION:** These results are not consistent with the findings of Smith-Ray et al. (2013) and Timmers et al. (2011). The lack of significant results may be due to the population tested, as they were young, healthy individuals who had good balance function. Additionally, the dose of resveratrol may not have been adequate to have an effect. These results indicate that the combination of this type of balance training and this dose of resveratrol supplementation may not elicit changes to balance

and stability in a young, healthy sample.

GAIT CHARACTERISTICS IN COLLEGIATE STUDENT-ATHLETES AFTER SUSTAINING A CONCUSSION

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BACKGROUND: Sports-related concussions have recently become one of the highest profile injuries in the athletic community. Concussions result from significant force to the brain that induces pathophysiological processes that affect its function. These effects can often present themselves through different combinations of physical, cognitive, emotional, and sleep symptoms. While neurocognitive computerized evaluations can provide useful information regarding self-report symptoms as well as quantitative measures including verbal memory, visual memory, visual motor processing speed and reaction time, they cannot provide values regarding areas such as balance or gait, which are also affected post-concussion. **PURPOSE:** To perform a longitudinal gait assessment of concussed NCAA Division 1 collegiate student-athletes.

METHODS: 5 participants completed a battery of neurocognitive and gait protocols at baseline and after sustaining a concussion. Neurocognitive performance was assessed with ImPACT™ and the gait protocol (10m walk under single and dual task conditions) was assessed through the use of the Mobility Lab software using the ADPM sensor system. Dual task conditions included a series of words asked to spell backwards, numbers to count down by, and the months recited in reverse order, all while walking normally. **RESULTS:** Preliminary analysis showed dual-task influenced gait at both baseline and post-concussion testing for most variables ($p < 0.05$). There were not any significant differences for time (baseline to post-concussion) for any gait measures, but there were both trends and significant Dual-Task x Foot (stride length, $p < 0.05$; step duration, $p < 0.10$), Time x Foot, and Time x Foot (% Swing and Stance; $p < 0.08$) x Dual-Task (lateral step variability, $p < 0.05$) interactions. **CONCLUSIONS:** Concussion affects the relationship between right and left foot patterns and differences are amplified as cognitive load is added. This has implications for concussion recovery and susceptibility to injuries if not fully recovered.

IMPACT OF LOW STRIDE TIME VARIABILITY ON RUNNING PERFORMANCE

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Stride time variability may be a factor that contributes to efficiency during running, especially when fatigued (Danion, et al., 2003). The purpose of this study was to observe the trends in stride time variability during a graded exercise running protocol on a treadmill. Fourteen young, healthy participants (20.9 ± 1.3 yrs) completed a 3-minute warmup at 4.5 mph on a level treadmill after which, the treadmill increased to a 3% slope for the duration of the experiment. Treadmill speed increased by 0.5 mph after each 90-second stage, and the study was complete when participants either voluntarily stopped at exhaustion or completed the tenth stage. Video was recorded at 60Hz from a sagittal view to observe the timing of consecutive footfalls. Data were reduced to stride interval time series from which the standard deviations were calculated for each stage. Initial and final standard deviations were compared using a paired samples *t*-test. Stride time variability was compared to performance in a linear regression. There were two interesting

findings from this study. First, on average, participants' standard deviation decreased by 13.1% from the first stage to their final stage ($p=0.039$). Second, participants completed different numbers of stages with a predicted decrease in deviation of 1.5ms (or 10.5% of the average stride time standard deviation) per completed stage ($R^2=0.40$, $p=0.0161$). These findings suggest that low stride time variability may contribute to greater performance in running. Future studies should aim to understand how gait characteristics evolve throughout the duration of a long, intense running bout.

COMPARISON OF ABSOLUTE GAIT PARAMETERS BETWEEN BREAST CANCER SURVIVORS AND HEALTHY CONTROLS DURING FORWARD AND BACKWARDS WALKING

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Older breast cancer survivors (BCS) report more falls and less stability than older adults with no cancer history. Spatio-temporal gait parameters are often used as indicators of fall risk in older adults. **PURPOSE:** To assess the differences in forward, backwards, and accelerated forward walking in BCS in comparison to a control group. **METHODS:** 13 postmenopausal BCS (mean age: 58.5 ± 8.5 years) and 8 postmenopausal healthy women (mean age: 60.8 ± 6.1 years) participated in the study. Gait was measured on the 16x4' Zeno walkway. Participants completed 5 trials each of forward, backward, and accelerated forward walking conditions. Participants had a lead and follow-up distance of 1m to capture steady-state gait. Gait speed, step length, step time, and stride width were used as dependent variables. A mean of five trials was used to run a Group X Condition repeated measures ANOVA. **RESULTS:** Significant group main effect indicated that BCS (59.63 ± 1.38 cm) had shorter step length compared to healthy controls (64.42 ± 1.76 cm) across all conditions ($p=0.045$). Significant condition main effect was observed for all the variables (all post hoc tests $p<0.001$). All participants walked with significantly shorter step length during backwards condition (48.43 ± 1.47 cm), followed by forward (64.38 ± 1.01 cm) and accelerated forward (73.26 ± 1.29 cm) conditions. All participants had a significantly shorter step time during accelerated forward condition (0.42 ± 0.01 s) compared to forward (0.52 ± 0.01 s) and backward (0.54 ± 0.02 s) conditions. All participants walked with significantly wider stride during backwards condition (16.07 ± 0.77 cm) compared to forward (7.65 ± 0.47 cm) and accelerated forward (7.31 ± 0.50 cm) conditions). No significant interaction was observed. **CONCLUSION:** Shorter step length irrespective of forward or backwards walking could indicate a more conservative gait approach among BCS. Overall, spatio-temporal gait parameters among BCS seem to be similar compared to healthy controls. Whether these results hold true based on exposure to surgery and/or radiation and/or chemo therapy needs to be determined.

RELATIONSHIP AMONG CHRONIC KNEE INJURY, LEG DOMINANCE, AND LOWER BODY KINEMATICS OF THE SAUT DE CHAT

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The purpose of the study was to examine the influence of chronic knee injury and leg dominance on the performance of the saut de chat among female collegiate dancers. Injury history, leg

dominance, and dance experience were evaluated for inclusion, and ten dancers consented to participate. A Biodex dynamometer was used to measure peak torque (PT) at 60, 180, and 300deg/sec for knee flexors and extensors as well as the strength ratio (SR) between the two. A 12 camera motion capture system and anatomical modeling software were used to measure knee angles, jump height, and takeoff/landing times for five trials performed on each takeoff leg. Based on average values, dominant knees had significantly higher PT in extension at 60 and 180deg/sec ($p=0.039$ and $p=0.040$ respectively) than non-dominant knees. No difference was found in PT for flexion. No significant differences were found between dominant and non-dominant legs for takeoff time, landing time, and jump height. There was no difference in takeoff time based on injury status. Differences were found in landing time and jump height with chronic injury resulting in shorter landing time and lower jump height ($p=0.0007$ and $p=0.008$ respectively). There was no difference in maximal flexion during either takeoff or landing. A major finding was that strength ratio varied by injury status with healthy dancers resembling other healthy, female, athletic populations, whereas dancers with chronic knee injuries had SRs comparable to a non-athletic population. Dancers with chronic knee injuries should be encouraged to undergo strength training to improve SR for eccentric function. Future research might explore whether dancers with chronic knee injuries are more susceptible to re-injury when performing movements at faster speeds.

EXERCISE AND RESILIENCE: DOES EXERCISE INFLUENCE HOW WE HANDLE, BOUNCE BACK FROM, AND ADAPT TO STRESS?

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Resilience is the ability to withstand, recover, and grow in the face of stressors and changing demands (Deuster & Silverman, 2013). Exercise may increase resilience but no investigations have examined if there is a relationship between exercise and resilience. **PURPOSE:** To determine if a relationship exists between exercise and resilience. **METHODS:** 320 individuals responded to the survey with 267 (189 female) respondents (age = 28.3 +/- 12.3) completing all questions. The survey included demographic questions as well as the Godin Leisure Time questionnaire, the Connor Davidson Resilience questionnaire (CDRISC), the Resilience Scale (RS), and the Ego Resilience Questionnaire (ER). It was distributed via Facebook and email correspondence. **RESULTS:** Correlations were calculated between the Godin Leisure Time questionnaire total activity as well as the moderate/vigorous activity scores and the resilience questionnaires. The total leisure time activity was correlated with the CDRISC ($r=0.188$), the RS ($r=0.164$), and the ER ($r=0.154$). The moderate/vigorous activity scores were also correlated with the CDRISC ($r=0.221$), the RS ($r=0.220$), and the ER ($r=0.159$). In addition, the RS has sub-categories and the strongest relationship was found between moderate/vigorous activity and perseverance ($r = .319$). Correlation coefficients are all significant at the $p < 0.05$ level. **CONCLUSIONS:** Based on the results of this investigation, there is a small to moderate positive relationship between exercise and resilience. Future research should determine if participation in an exercise program can increase resilience.

VESTIBULAR DEFICITS IN CONCUSSIONS: RELATIONSHIPS BETWEEN CONCUSSION MECHANISM AND NEUROCOGNITIVE PERFORMANCE

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It is estimated that 5-10% of athletes will experience a concussion during any given sport season. Athletes experience concussions actively (making a tackle) or statically (being hit by a baseball pitch). Research has shown that vestibular impairments, such as dizziness or postural instability, are common symptoms following concussion. However, research has not explored whether the mechanism of concussion is a determinant of whether an athlete does or does not experience vestibular deficits. The purpose of this study was to investigate if vestibular-ocular symptoms and neurocognitive performance were related to mechanism of injury. ImPACT™ was used to determine neurocognitive performance and surveys to determine vestibular symptoms and concussion history in 116 club athletes. Of the athletes tested, 36 were previously concussed with 20 having two or more vestibulo-ocular symptoms. Of the previously concussed athletes 9 occurred stationary and 23 occurred during various activity levels (active, moderately active, highly active). Concussed individuals with vestibulo-ocular symptoms including dizziness, sensitivity to light, visual issues, blurred vision and balance problems were more impaired on visual and verbal memory. Concussion mechanism did not show differences but power is low in this sample, vestibulo-ocular symptoms were found across all groups. History of concussion with vestibulo-ocular symptoms and mechanism of concussion is related to lower scores in visual and verbal memory. Further research on concussion mechanism and vestibular symptoms is needed. Future research should target advantageous recovery based on symptoms and promoting the benefits of visual and vestibular training.

ASSOCIATION OF ACL INJURY IN STUDENT-ATHLETES WITH CONCUSSION HISTORY

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Visual spatial attention may have a strong impact on musculoskeletal injury. However, this aspect of neurocognitive performance in relation to this type of injury has not been extensively studied. Some studies do show that poor neurocognitive performance, including visual motor speed, have also been at an elevated risk for injury. Herman et. al. (2015) showed a positive association between concussion history and lower extremity injuries (odds ratios, 1.6-2.9 elevated risk) among student-athletes at the conclusion of their intercollegiate athletic careers. A deficit in visual spatial attention may not allow the athlete to correctly interpret or react to an evolving environment, which may put them at more risk of experiencing an injury. The purpose of this study was to investigate potential relationships between concussion history, baseline visual neurocognitive performance, ACL injury history, and the use of a visual aid in student-athletes at Elon University. One hundred and forty eight student-athletes enrolled at Elon University filled out a questionnaire regarding ACL injury history, concussion history, and use of a visual aid. Each athlete noted both the total number of concussions and ACL injuries they have sustained over their respective athletic careers. Each athlete's baseline ImPACT and King Devick data, along with their respective questionnaire results, were statistically analyzed using SPSS Statistics computer software to look for significant relationships between vision, concussion history, visual aid use, and ACL injury history. Several t-tests performed showed that those with a history of ACL injury had a significantly slower mean score on the King Devick test

(48.86 ± 7.20 seconds) than those without a history of ACL injury (42.92 ± 11.13 seconds, $p = 0.01$). No significant relationships were found amongst the other variables studied. These results show that an elevated King Devick score, usually indicating impaired visual motor ability in general and specifically after receiving a concussion, may also be an important indicator of an elevated risk of experiencing a lower extremity injury.

THE EFFECT OF NIGHTTIME EATING ON MORNING RESTING ENERGY EXPENDITURE, SATIETY, AND RESISTANCE EXERCISE VOLUME

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BACKGROUND: Protein ingestion will elicit greater thermic effect of food, increase resting energy expenditure, satiety, and decrease respiratory quotient compared to a placebo (Acheson et al., 2011; Bowen, et al., 2006; Halton & Hu, 2004). As skipping breakfast becomes more common it becomes important to determine if nighttime supplementation can provide an alternative to breakfast, allowing individuals to wake up feeling satisfied, to improve their morning metabolism, and help them perform a morning resistance training session. **PURPOSE:** To determine the dose response of two different proteins, whey (WP) and casein (CP) when consumed before sleep affects next morning appetite, resting energy expenditure (REE), and resistance training (RT) volume compared to a non-caloric placebo (PLA). **METHODS:** five physically active men and seven women (age, 24 ± 2 ; body fat, $20.1 \pm 1.8\%$) participated in this randomized, double-blind, crossover study. One-repetition maximums (1-RM) were performed on six exercise machines to determine exercise intensity. Each trial was separated by 48-72 hours. A single dose of 24g WP, 48g WP, 24g CP, 48g CP, or PLA was consumed 30 minutes prior to sleep. Measurements of appetite (visual analogue scales (VAS) for satiety, hunger, and desire to eat), REE (indirect calorimetry), RT volume (2 sets of 10 repetitions and 3rd set to failure at 60% of 1-RM for each exercise) were performed the next morning (0600-0900 hours). Statistical analyses were conducted using repeated-measures ANOVA for all variables. All significance was accepted at $p < 0.05$. **RESULTS:** There were no significant differences in satiety, hunger, desire to eat and REE between the supplements. In addition, there was no significant difference in RT volume (24g WP: 120 kcals, 24g protein, 4g carbohydrate, 1g fat; 48g WP: 240 kcals, 48g protein, 8g carbohydrate, 2g fat; 24g CP: 120 kcals, 24g protein, 4g carbohydrate, 1g fat; 48g CP: 240 kcals, 48g protein, 8g carbohydrate, 2g fat; PLA 2.9g, 0 kcals, Propel Zero™). **CONCLUSION:** Varying doses of WP and CP prior to sleep did not have an effect on morning appetite, REE, and RT volume. WP and CP can be consumed prior to sleep without impeding next morning metabolism and training volume.

THE EFFECTS OF WHEY VS. SOY PROTEIN AT BREAKFAST ON APPETITE RESPONSE, ENERGY METABOLISM AND SUBSEQUENT ENERGY INTAKE

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BACKGROUND: There is inconsistent evidence regarding how different protein sources affect satiety and energy intake. Whey (animal-based) and soy (plant-based) proteins were chosen

because they are both considered “complete” sources and are comparable in their absorption and digestibility characteristics. **PURPOSE:** The present study investigated the effects of animal-based (whey) compared to plant-based (soy) protein on perceived hunger, fullness, satiety, desire to eat, prospective food consumption, energy metabolism and subsequent energy intake.

METHODS: A total of 17 healthy (age: 27 ± 2 years; body fat: $21.5 \pm 1.7\%$; BMI: 25 ± 1 kg/m²) men (n = 6) and women (n = 11) consumed three isocaloric breakfast smoothies with either whey, soy, or carbohydrate (no protein) in a double blind, randomized crossover design. During each testing visit participants completed a 0-10 rating scale of appetite profile (before, 0, 60, 120, 180 minutes). Indirect calorimetry was used to determine the thermic effect of a meal (TEM) (at 45-60, 105-120, 165-180 minutes). In addition, caloric intake at an *ad libitum* lunch was recorded. **RESULTS:** Repeated-measures ANOVA showed a significant difference in hunger ($P = 0.03$), satiety ($P = 0.001$), fullness ($P = 0.001$), desire to eat ($P = 0.03$), and prospective food consumption ($P = 0.04$) between the three breakfast test meals. Measures of fullness and satiety were higher whereas hunger, desire to eat, and prospective food consumption were lower after consumption of whey and soy protein compared to carbohydrate. A significantly higher ($P < 0.001$) oxygen consumption (VO₂) and lower ($P < 0.05$) respiratory exchange ratio (RER) was observed after whey and soy compared to carbohydrate. In addition, a higher ($P = 0.05$) energy intake at lunch was observed after carbohydrate (769 ± 63 kcals) compared to whey (654 ± 61 kcals) and soy (664 ± 72 kcals) breakfast test meals. However, there was no significant difference ($P > 0.05$) in energy intake at lunch between whey and soy conditions.

CONCLUSION: Consuming whey or soy protein at breakfast led to similar perceptions of appetite profile and comparable effects on energy metabolism, suggesting that soy may be a sustainable, dairy-free protein supplement source to aid in body weight control.

CONCUSSION RECOVERY: GAIT CHARACTERISTICS IN COLLEGIATE STUDENT-ATHLETES

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BACKGROUND: After being overlooked for decades as just a part of the game, sports-related concussions (SRC) are quickly becoming one of the most concerning and complex injuries in athletics. Concussions result from significant force to the brain that induces pathophysiological processes that affect its function. These effects can present themselves through different combinations of physical, cognitive, emotional, and sleep symptoms. While neurocognitive computerized evaluations can provide useful information regarding self-report symptoms as well as quantitative measures regarding memory, motor processing speed and reaction time, they cannot assess areas such as balance or gait, which are also affected post-concussion and equally important for athletic participation. **PURPOSE:** To assess gait characteristics in concussed NCAA Division 1 collegiate student-athletes at various time periods following a concussion. **METHODS:** 47 participants completed an assessment of gait at baseline (n=24), while symptomatic (n=13) and/or when cleared to return-to-play (n=10). The gait protocol (10m walk under different cognitive loads, single and dual task) was assessed through the use of the Mobility Lab software and APDM sensor system. Gait measures included cadence, gait speed, step length, step duration and double stance time. **RESULTS:** A 2 (cognitive load) x 3 (time) MANOVA was conducted. There was a significant overall cognitive load main effect ($p < 0.05$),

time main effect ($p < 0.05$) and a cognitive load x time interaction ($p < 0.05$). Univariate analysis showed there were significant differences for all variables when a cognitive load was added ($p < 0.05$). There were no significant differences found for gait speed ($p > 0.05$), but significant differences were found between assessment phase groups for double support ($p < 0.05$), step duration ($p < 0.05$) and cadence ($p < 0.05$). **CONCLUSIONS:** Time point in recovery and cognitive load affects gait patterns. Overall speed does not show differences in recovery; however, underlying mechanisms of control still remain affected even when student-athletes are returned to play. This has implications for concussion recovery and susceptibility to injuries if not fully recovered.

DIFFERENCE IN SINGLE LEG BALANCE COMPARING FLAT FOOT AND RELEVÉ (PLANTARFLEXED) POSITIONS IN COLLEGIATE BALLET DANCERS

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Balance is an important factor to success in ballet. Past studies have analyzed factors that may influence a ballet dancer's performance, including balance and stability. Research has shown that dancers with at least 7 years of training are more successful in maintaining postural stability than novice or similarly trained, injured dancers in single-leg conditions. In addition, leg preference has not been shown to be a significant factor in balance after landings (Lin, 2011, Mertz, 2012). Ballet dancers frequently perform in the single-leg relevé position which is a condition that decreases the base of support resulting in less stability as compared to a flat footed position. The purpose of this research was to examine differences in single-leg balance in flat foot (FF) and relevé (RF) positions of collegiate dancers. Differences in balance scores between preferred leg for static and dynamic conditions were also examined. Fifteen experienced female collegiate ballet dancers (height 1.67 ± 0.06 m; weight 62.98 ± 7.52 kg; age 21 ± 1.41 yrs) consented to participate. Participants completed a questionnaire establishing preferred balance leg for a static (arabesque) and dynamic (pirouette) ballet condition. The Biodex™ Balance System was used to test single leg stability in the FF and RF conditions, alternating between left and right legs to minimize fatigue. The test consisted of three 20-second trials. Averaged scores represented measures of overall, medial-lateral, and anterior-posterior balance. Data was analyzed using 2x2 ANOVA's. As expected, overall FF scores were significantly better than RF ($p = 0.001$) with no differences between left and right. Anterior-posterior scores were significantly better in FF ($p = 0.002$) and no differences were found in medial-lateral scores or between left and right legs for either anterior posterior or medial-lateral measures. There was no difference in scores based on leg preference regardless of position. In conclusion, dancers appear to be equally proficient in balance bilaterally and on preferred static and dynamic legs. It is more difficult to balance in RF, although only in the anterior-posterior direction. Future research might explore the mechanisms utilized in maintaining balance from side-to-side versus front-to-back.

WEIGHT CONTROL AND DIETING PRACTICES AMONG COLLEGE WOMEN

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Background: As college students move away from home, weight management may be

something they struggle with. In addition, they may not know the best ways to manage weight and instead, they look for an easy quick fix. It has been suggested that unhealthy weight management practices lead to health concerns and negative long term health (Lupi et al., 2015), yet people continue to engage in these questionable weight management strategies (Williams et al., 2007). **Purpose:** The purpose of this study was to determine the types of weight management strategies, reasons for choosing a certain strategy, weight perceptions, and body composition among college women. **Methods:** 25 females (age: 21 ± 1 yrs, height: 155 ± 5 cm, weight: 60 ± 7 kg, BMI: 22 ± 2 kg/m², body fat: $25 \pm 4\%$) were recruited to participate in the study. Participants completed a packet of questionnaires including the Eating Attitudes Test (EAT-26), a 24-item Compulsive Exercise Test (CET), a 69-item Multidimensional Body-Self Relations Questionnaire (MBSRQ), a 25-item Weight Control Practices and Habitual Physical Activity Questionnaire to assess eating and exercise habits, body image, and weight management strategies. Additional information such as age, height, weight, and body composition were also measured. Body composition was measured via Biodynamics Bioelectrical Impedance (BIA) Body Composition Analyzer. **Results:** The preliminary analysis indicated the following diet choices: 56%-no specific diet, 12%-meat reduction diet, 8%-vegetarian diet, 8%-Atkins diet, 8%-"other" diet, and 4%-Paleolithic diet. When asked to report what influences their diet, 80% reported "health reason (my idea)", 72% reported "weight management", 60% reported "appearance", 44% reported "likes the taste better", 36% reported "convenience", and other various, less influential, reasons. **Conclusion:** The preliminary results suggest that though the majority of college age women do not follow a specific diet, the most influential reasons dictating their dietary choices are health, weight management, and appearance. Further, eating and exercise habits, weight management strategies, and weight perceptions will be assessed to understand the impact these measures have on choice.

INFLUENCE OF SLEEP, SYMPTOMS AND NEUROCOGNITION ON VISUAL PERFORMANCE AND NUMBER OF CONCUSSIONS IN COLLEGIATE STUDENT-ATHLETES

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Research has found that having a previous concussion may be a risk factor for experiencing another concussion as well as possible lower musculoskeletal injury. There have been many theories proposed for why this might be the case; however, a proposed theoretical model examines the relationship between sleep behavior, history of concussion, psychological stress and neurocognitive performance, dual task performance and visual attention. The purpose of this research is to determine the effect of sleep and neurocognitive performance on number of concussions and visual performance in collegiate student-athletes. 95 collegiate student-athletes (36 females; 59 males) completed the Immediate Post-Concussion Assessment and Cognitive Testing (measure of neurocognitive performance, concussion history and sleep), the King-Devick (KD) Test (measure of visual attention), and completed two tests of postural control. During the gait (walking 10 m) and balance (standing on a force plate) tasks, individuals also performed simple mental tasks. The individuals were asked to spell 5 letter words backwards, count by 6's or 7's and say the months of the year in reverse order. Linear regressions were performed to predict both the number of concussions and KD based off of the proposed variables and symptoms. Significant relationships were found between total symptoms, hours of sleep and

impulse control with number of concussions. Total symptoms and sleep symptoms were correlated with KD performance. Hours of sleep, sleep symptoms and total symptoms all predicted number of concussions. Hours of sleep and total symptoms predicted KD performance. This research begins to examine the relationships proposed in the theoretical model, specifically that visual attention, neurocognitive performance and sleep may be related to injury. Future research might want to be more prospective in examining this model as opposed to retrospective.

Finance

FINDING FRAUD: FINANCIAL RATIO ANALYSIS AS A FRAUD DETECTION TOOL

Jacob P. Jimenez (Dr. Catherine Chiang) Department of Accounting
PLEASE SEE ABSTRACT UNDER ACCOUNTING

INNOVATING RETURNS: INCENTIVE ALIGNMENT AND ACQUIRER INNOVATION IN MERGERS/ACQUISITIONS

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Billions of dollars are spent each year on mergers and acquisitions, yet most of these transactions result in a loss in value to shareholders. Despite the average loss in value, companies keep going through with these transactions knowing that the statistics are not in their favor. There have been many previous studies looking into this phenomenon, but there are no studies that look at the role that intellectual capital plays in the success of the firm post M&A. This study will examine the relationship between intellectual capital and M&A transactions using three different dimensions. First, we will examine how the retention of key employees relates to the success of the transaction. For example, in 2003, AOL acquired Netscape, a web-browser developer. While AOL bought the web browser, they did not retain the top employees, causing AOL to fail in utilizing their purchase. These top employees then formed Mozilla, a successful Internet browser company. The second dimension of this study is the compensation package of the top employees of the firm. We hypothesize that equity compensation motivates the employees to work harder to better the company, thus making the new company successful. Finally, this study will look at the level of intellectual intensity of the firm. Some firms with a high level of intellectual capacity rely heavily on human capital compared to firms with a low level of intellectual capital (i.e. manufacturing firms). Our hypothesis is that a firm with high intellectual capital will get more value from an M&A transaction if they retain key employees and compensate them with larger equity packages. To conclude, this study attempts to explain M&A success and failure by analyzing how firms manage their intellectual capital.

DETERMINING THE ENDORSEMENT VALUE OF PROFESSIONAL GOLFERS

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The aim of this study is to find out the endorsement value of the top professional golfers in the

world. This valuation is an important question for endorsement companies because they want to make sure they receive a proportional return on their investment. For a firm considering using athletes to endorse their products, they need to be able to determine a realistic value for their endorsers. We utilize traditional financial valuation techniques, specifically discounted cash flow analysis, to determine a realistic value for potential product endorsers. Our research utilizes the top 20 golfers according to the Official World Golf Ranking (OWGR). The total yearly earnings for each golfer is determined from their combined earnings on the three major professional golf tours: the PGA Tour, the European Tour, and the Web.com Tour. From these earnings numbers, each player was assessed a different growth rate depending on how their earnings changed from year to year and then their earnings were projected out for the next ten years. Additionally, a required rate of return was needed to discount their future cash flows. We determined this discount rate by estimating the riskiness of each golfer determined by factors such as average and volatility of their yearly world golf ranking and age. Our model results in dollar values for each golfer and indicate that players who are steadily near the top of the OWGR and have higher earnings growth rates are the most valuable to endorsement companies. This is because these players have the highest expected value of future cash flows.

History

CONVENTS AND SALONS: BOURGEOIS FEMALE EDUCATION AND THE SALONNIÈRES IN 18th CENTURY FRANCE

Nicole B. Ackman (Dr. Michael Carignan) Department of History and Geography

In 18th century France, most bourgeois or lower nobility girls received a moral-based education through attending a convent, if they were educated at all. This presentation demonstrates that a small number of women who organized salons in Enlightenment Paris provided an alternative model of a literary-based education for those who participated. The salons were a unique phenomenon as women called salonnières hosted the gatherings that brought together the greatest thinkers of the day to discuss their works and ideas. Salonnières challenged the traditional model of education by gaining access to both texts and the authors themselves and thus afforded a select group of women the opportunity to be involved in French intellectual life. While many contemporary male and female writers agreed that girls' education needed to be reformed, convent education continued to be the norm when any was provided at all. Many important thinkers disagreed with women being involved in academia; most significantly, Rousseau outlined a much more conservative form of education in his work, *Sophie*, focused on preparing girls to be proper wives and mothers. Yet many of the salonnières, like Madame Geoffrin, began their salons to receive the education they had lacked in their youth under the traditional model. The salon acted as an informal school where salonnières like Julie de Lespinasse pursued the education they desired. By reading and interpreting secondary texts, letters between salonnières, and Rousseau's *Émile*, this research provides new insights to the competing educational models for bourgeois girls of Enlightenment Paris. This presentation represents one chapter of my larger research for my Honors Thesis on how 18th century salonnières defied the gender roles of their time and situation.

THE MALIGNANT BETRAYER VS. THE MOM: MEDIA PORTRAYALS OF GENDER IN THE ALDRICH AMES SPY CASE

Gabriela R. Alvarez (Dr. Peter Felten) Department of History and Geography

The 1994 arrest of Central Intelligence Agency (CIA) officer and Soviet spy Aldrich Ames created a media sensation. When the media discovered a female CIA agent, Sandra Grimes, helped lead the group that uncovered Ames' treason, both news organizations and the popular media jumped on the story of the malignant betrayer versus the mom. That sensation is the focus of my research on media portrayals of gender and espionage in the post-Cold War U.S. Ames' alcoholism and infidelity (to both his first wife and his country) call his masculinity into question when examined under gender norms of this time period. Grimes' strong leadership contradicts stereotypical frameworks of women in intelligence. While women's roles were expanding in the media of the 1990s to include depictions of leadership and independence, traditional expectations of women as either seductresses or damsels in distress lingered in the realm of espionage, particularly in the fraternity culture of the CIA. In order to understand these gender roles and their significance to the respective fields of gender and intelligence, this research will utilize a historical analysis of four primary and several secondary media sources. Primary works include Grimes' book, "Circle of Treason," Cherkashin's book, "Spy Handler," the movie "The Traitor Within," and the mini-series "The Assets." Secondary sources include "Killer Spy," "NightMover," "Confessions of a Spy," and multiple newspaper articles in Spanish regarding Ames' second wife, Rosario. The study found that describing gender norms for women was emphasized, even though Aldrich Ames was the central figure of the case. While more modern depictions of the narrative feature an empowered Sandra Grimes, media from the 1990s focuses on a new category of women in espionage: the grandma. Extreme fascination with Rosario Ames' role was also a central component of media coverage. These depictions are useful for understanding the evolving role of women in intelligence and the portrayals of unconventional gender roles in the pivotal post-Cold War context of the United States.

"OUR STRONG FORTRESS": THE RESILIENCY OF AGRICULTURE IN THE POST-CIVIL WAR VIRGINIA TOBACCO BELT

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Scholars have disagreed as to exactly whether, why, and how Virginia's tobacco belt declined in terms of tobacco production and relative economic clout within the Commonwealth during the nineteenth century. Moreover, scholars have only recently undertaken analysis of the Civil War's impact on the tobacco belt. The Civil War's environmental, economic, and even social impacts permeated into areas not specifically touched by combat. Historians have debated how the disruptions of the war, especially emancipation and environmental degradation, influenced agricultural production. In sum, scholars have been studying agriculture in Virginia for as long as Virginia has been settled, they have failed to reach a consensus as to whether the Civil War or any related factor significantly harmed the productivity of Virginia's tobacco planters. The focus of this study is to produce more comprehensive conclusions about the ways in which the Civil War affected the tobacco economy of Virginia's Southside region. In addition to extensive reading in the secondary literature, this study depends heavily upon primary source research.

Data from the agricultural census from the years before, during, and after the Civil War provides the evidentiary backbone. In addition, nineteenth century publications such as *Clarksville Tobacco Plant, Commercial and Tobacco Leaf*, and *Tobacco Plant* provided commentary from planters inside the region. Pamphlets distributed by the Southern Fertilizer Company of Richmond offered provocative evidence about how Virginians interpreted the challenges and opportunities facing planters after the Civil War and how businesses sought to cater to those notions. This study concludes that the Civil War represented only a minor and temporary hindrance to the productivity of planters in the tobacco belt. Postwar harvests far exceeded prewar totals by 1880. Furthermore, at least from the perspective of the Southern Fertilizer Company, former Confederates had more reason than ever to grow tobacco after the war. Finally, the emergence of manufacturing centers to process tobacco in nearby urban centers also buttressed the postwar profitability of Virginia's tobacco planters.

AUTONOMOUS REGIONS OF CHINA; HISTORY, EFFECTIVENESS AND POSSIBLE SOLUTIONS TO TIBETAN AUTONOMOUS REGION

Ann L. Glynn (Professor Xiaolin Duan) Department of History and Geography

Despite the international recognition Tibet got in the mid-1990's, it seems that their problems have now been dismissed by the international community. The same issue that the Tibetan Freedom concerts were advocating for in 1996, however, continues to create tension for not only Chinese boundaries, but the US-China relationships. To some extent, the Autonomous Region has a benefit to the Tibetan people, but it ended up creating more problems. The over simplified political model could not tangle with the complicated problems with Tibet throughout the history. If the relationship between china and Tibet is studied, along with comparing Tibet to other regions like it in the world, then a solution to the problems in the autonomous region may be possible to find. This study traces back to the beginning of the 19th century and looks at the relationship between China and Tibet, up until present time. Then it goes into the pros and the cons that have arisen since the Peoples Republic of China established Tibet as an autonomous region in 1959. This research draws evidence from both Western and Chinese secondary sources, as well as the face-to-face interviews with people from the PRC and Americans who have been to China or were largely exposed to discussion of Tibet. Incorporating different points of view and comparisons with other autonomous regions in other parts of the world, this study will come up with possible solutions to the problems regarding Tibet. A working solution could be to bring more people who currently live in Tibet, not limited to officials and Tibetans, to the negotiation table. Compromising has its power, and this compromise should be done on either side of the argument.

EDUCATING GLOBAL CITIZENS: A COMPARATIVE CASE STUDY REGARDING AMERICAN AND MOROCCAN UNIVERSITY STUDENTS AND THEIR GLOBAL KNOWLEDGE, AWARENESS, AND PERCEPTIONS

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In more recent years, there appears to be a wider and a growing interest in globally-focused education. This project will explore the success of globally-focused education in two very

different countries: the United States and Morocco. These two distinct nations have contrasting educational systems, beliefs, locations, and lifestyles. Questionnaires from university students in each country assess their knowledge of subjects such as geography, history, current events, and religion. They also provide insights into the students' global perceptions and global awareness. This research is both quantitative and qualitative, and it offers an original perspective by utilizing a comparative case study of students' knowledge in these two nations. The results reveal valuable insights on the countries' respective educational systems and cultural values.

HOW SEPTEMBER 11 INFLUENCED THE PORTRAYAL OF THE MIDDLE EAST, ISLAM, AND MIDDLE EASTERN PEOPLES IN COLLEGE SURVEY AMERICAN HISTORY TEXTBOOKS

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As the twin towers fell on September 11, 2001, many Americans saw the terrorist attacks as a turning point in American history. In the ensuing years, history teachers and professors have examined how to teach American history in light of modern terrorism and tensions within the United States, particularly those relating to the Middle East and Islam. This research asks how has the narrative about the Middle East, Islam, and Middle Eastern peoples that appears in college-level American history survey textbooks changed since the terrorist attacks of September 11. By focusing on textbooks and how they have changed, this research provides a new analysis of how conflicts relating to the Middle East and Islam have been portrayed for students. Other literature on how textbooks portray the Middle East, Middle Eastern Peoples, or Islam focus on current high school or middle school textbooks, whereas this research looks at change over time in college textbooks. This research is based on an historical narrative analysis of eight textbook series. Within each textbook, the researcher examined every post-1900 reference to the Middle East, Islam, or Middle Eastern peoples for content, interpretation, narrative style, and language in order to analyze changes and continuity over time and patterns between textbook series. The researcher has analyzed at least three editions of each textbook: the edition immediately preceding September 11, the edition immediately following September 11, and the most recent edition of the textbook. The findings of this research suggest that college survey textbooks shifted from a post-Cold War frame during the late 1990s and early 2000s towards a new frame surrounding the threat posed by Islamic terrorism in the 2010s. This shift in framing can be found in multiple parts of the text but is most pronounced surrounding the Israeli-Arab conflicts and discussions of Islamic fundamentalism and terrorism. While some textbooks include material which combats this frame, they do not provide another frame through which the Middle East, Islam, and Middle Eastern peoples can be viewed.

RELIGION AT THERESIENSTADT: JEWISH IDENTITY IN HOLOCAUST SURVIVORS' TESTIMONIES AND AUTOBIOGRAPHICAL ACCOUNTS

Daniel J. Weiss (Dr. Andrea Sinn) Department of History and Geography

The number of Holocaust survivors is rapidly declining, therefore, scholars have placed a strong emphasis on collecting testimonies of those who witnessed the heinous crimes committed by the Nazis during World War Two. This research project analyzes the role Judaism played in the lives

of concentration camp inmates in order to demonstrate how the years of imprisonment altered Jewish identity. By analyzing personal narratives, this study discusses how Holocaust survivors described their daily routines, the camp environment, and personal experiences during the time of their imprisonment. Theresienstadt, one of the largest concentration camps established by the Nazis during World War Two, serves as a case study for two reasons: the diversity of prisoners in the camp and the large amount of oral histories and written autobiographical accounts reflecting on their experiences. This SURF presentation will introduce the results of the in-depth analysis of fifteen oral histories in which Jewish survivors report on their personal experiences and address the role their Jewish identity played during their imprisonment in Theresienstadt. All of the analyzed survivor accounts demonstrate that traditional Jewish practices and communal organizations changed drastically compared to what they were before the start of Nazi persecution and the outbreak of World War Two. In addition, the comparative evaluation of these testimonies highlights a number of common characteristics concerning narrative structures and thematic focuses. For example, Joseph Winkler, a Galician Jew born in 1903 discusses, in great detail, the importance religion played in his life prior to being deported to Theresienstadt. In contrast, when reflecting about his imprisonment, he does not talk about religious life or practices at all. The absence of any discussion of religion speaks volumes about the profound affect being imprisoned in camps had on an individual's Jewish identity. Other aspects that reflect how Jewish identity continued to play a role in inmates' lives or changed in response to the camp environment are religious practices, such as traditional Jewish marriages, and the newly formed political structures, such as the Jewish council. This research is part of a larger research project investigating the role of Religion at Theresienstadt.

Human Service Studies

WHAT MAKES COMMUNITY GARDENS SUCCESSFUL? AN ASSESSMENT OF ELEMENTS AND INFRASTRUCTURE THAT CONTRIBUTE TO EFFECTIVE COMMUNITY ENGAGEMENT AS A MEANS OF CULTIVATING COLLECTIVE EFFICACY IN COMMUNITY GARDENS ACROSS NORTH CAROLINA

Chloe L. Donohoe (Dr. Beth Warner) Department of Human Service Studies

Community gardens are a trendy project among agencies in the nonprofit and government sector. The perceived benefits are often weighted more than the need for community ownership and the consideration of barriers of entry for community members. The specific processes that occur within community gardens that allow for neighborhood improvement have hardly been understood. The sustainability of a garden is its ability to build and maintain structures of self-sufficiency. The community garden becomes a “third place” outside of work and the home, where communities can develop shared beliefs in its capabilities to make changes in their community or collective efficacy (Ohmer, 2008; Firth, Maye & Pearson, 2011; Oldenburg, 1998; Glover, 2004; Pudup, 2008; Sampson, 2003). This research aims to identify and examine individual and organizational factors in neighborhood community gardens throughout North Carolina that lead to sustainability and collective efficacy. In the Spring and Summer of 2016, 28 interviews were conducted with garden managers and participants from 11 gardens across North Carolina. Analysis of these interviews found several themes across the gardens related to the

sustainability of community gardens and their ability to promote collective efficacy. Preliminary findings indicate that the history, garden structure, mission, harvest distribution partnerships, leadership and decision making play key roles in sustained engagement of participants and cohesion of the garden community. The final results of this analysis will be presented at the conference and will provide greater clarity of the mechanisms that allow community gardens to maintain participation and build capacities to address problems in the community.

BRIDGING THE GAP: FACILITATING CONNECTIONS BETWEEN COLLEGE STUDENTS AND THEIR LOCAL CAMPUS COMMUNITY

Jennifer Y. Fukunaga (Dr. Bud Warner) Department of Human Service Studies

Nationally, there is a disconnect between college campuses and their surrounding communities as an increasing number of students attend post-secondary schools outside of their home states. Existing research has demonstrated the benefits of engaging post-secondary students in their university communities for both individuals and institutions such as economic vitality and higher graduation rates. However, there currently are low levels of engagement between campuses and communities across the country due to a lack of sustainable, integrated partnerships. This project uses Elon University as a case study for understanding college student motivations and attitudes towards community engagement within the community surrounding campus. Through focus groups and interviews with Elon students, faculty, staff members, and community leaders a comprehensive analysis evaluating effectiveness of current community engagement initiatives provides the potential for improving campus programming and community relations.

SIMPLE VOLUNTEERS OR DIGNIFIED WORKERS? : WOMEN'S ROLES IN THE WAR ON POVERTY AND COMMUNITY ACTION PROGRAMS

Kara E. Gustaveson (Dr. Beth Warner) Department of Human Service Studies

The start of the War on Poverty in 1964 changed the focus and employment methods of anti-poverty programs. Roles that had previously been limited to politicians and community leaders now began to be filled by community members of different social standings and socioeconomic classes through the idea of maximum feasible participation and the creation of Community Action Agencies (Glen, 1995; Strange, 1972; Davies, 1992). One new group that gained a role in these programs was women. While scholars have studied the overall War on Poverty in great detail, the discussion on women's roles has been fairly limited. Even among scholars who did study them, many originally ignored women's contributions and long-standing influence on community action or limited the scope of their study to larger urban areas (Naples, 1998). This project then expands upon that discussion by exploring the roles and experiences of women in Community Action during the War on Poverty, through the use of Alamance County as a case study. Through using interviews with members of the community, who have worked closely with the Alamance County Community Services Agency, and through information gained from other primary historical documents (i.e. newspaper articles and congressional notes) conclusions were drawn which link this data to larger patterns of women's involvement in social services. Overall, this research concluded that though social service work is typically viewed as a female-dominated industry today, women's roles were different in the mid to late 1960s in Alamance

County. Men typically held supervisory and administrative roles, while women worked as volunteers, community workers, secretaries, and in other roles, which lacked in overall permanence. It was not until the beginning of the 1970s when patterns began to shift, setting the stage for how the agency would progress through the remainder of the twentieth century and into the current one. Potential reasons for this include the increasing societal emphasis on service work as being work done primarily by women and the idea that women being mothers gives them more of a capacity to work in this industry.

ORIENTATION'S EFFECT ON MENTAL HEALTH AMONG FIRST-YEAR COLLEGE STUDENTS

Nicky Kratzer (Dr. Bud Warner) Department of Human Service Studies

The transition to college can also be a time when students' mental health is fragile and vulnerable. Students are often in high stress environments because of these adjustments, and this increased stress can lead to an increased risk for developing a mental illness (Mahmoud, Staten, Lennie & Hall, 2015; Pisanti et al., 2014). The current study took place at a small, private, liberal arts university in the Southeast of the United States during the Fall of 2015. A random sample of twelve first-year seminar classes was selected, with a total of 167 students able to participate in the study. Participants completed a survey in the beginning of the semester, which assessed their perceived social support, New Student Orientation experience, and any anxiety and depressive symptomology they experienced during their time at Elon thus far. Participants were then contacted at various points later in the semester and retook the survey. Results showed that as students felt more comfortable with their Orientation Leader and Orientation group, they were less likely to express anxiety and depression symptomology. These results have the ability to influence the structure of many first-year programs which assist students in their transition to college.

DIFFERENT MIRRORS: LOOKING AT FACTORS THAT CONTRIBUTE TO DIFFERENCES IN FEMALE SELF-ESTEEM ACROSS RACIAL LINES

Briana E. Pfeuffer (Dr. Beth Warner) Department of Human Service Studies

According to past research, minority women (especially Black women) score consistently higher on self-esteem measures than their White female counterparts (Rosenburg & Simmons, 1972; Sabik, Cole & Ward, 2010; Bachman, O'Malley, & Freedman-Doan, 2011). One might argue that because of the relationships between self-esteem, health, and well-being it is important to examine the factors that contribute to this trend (Ashcraft & Belgrave, 2005; Rhea & Thatcher, 2013). This study was designed to further explore the factors that might contribute to differences in self-esteem across racial lines and their implications for working with diverse communities. Surveys and semi-structured interviews of Elon University students were used from a variety of racial and ethnic backgrounds to obtain data for this project. Then the survey data was analyzed through statistical methods and the interviews through a grounded theory method. Surprisingly and contrary to the field of research, few common themes existed across racial lines but rather emerged across the women's shared experiences. For example, supportive parents, feeling isolated at school, and differing experiences with ethnicity were much more common themes of

discussion. Ultimately, the research conclusion shows that racial identity, while important, is only one aspect of an individual that affects their perception of self.

UNSEEN DIFFERENCES: CULTURAL DIVERSITY AMONG HISPANIC AND LATINO STUDENTS

Claudia I. Rodríguez (Dr. Rodney Parks & Mr. Jesse Parrish) Department of Human Service Studies & Office of the Registrar

At Elon University, the Hispanic/Latino population is steadily increasing. As of fall 2016, this group now makes up 5.4% of the undergraduate student population. As an institution committed to fostering an inclusive community, Elon invests heavily in the development of programs and resources that will promote the diversity of its students and encourage meaningful interactions among them. However, Hispanic/Latino students feel that there is a measure of dissonance between subgroups of their own community that makes it difficult for them to fully appreciate the resources offered by the institution. Unfortunately, this dissonance is sometimes invisible to administrators, who often consider the Hispanic/Latino subpopulation to be homogeneous.

This study attempts to expose the root causes of these misunderstandings and what students believe the institution can do to close the divide within the Hispanic/Latino community. Eight domestic and international Hispanic/Latino students were interviewed regarding the separation between their subgroups, the reasons for the separation, and suggestions to bridge the gap. Researchers distilled and explored the primary themes of intragroup racism and marginalization, a perceived lack of institutional resources, and the social influence of socioeconomic status. The results of the study inform recommendations for the creation and improvement of programs that will be effective in attracting and retaining Hispanic/Latino students from various backgrounds, as well as initiatives that may improve intra- and intergroup connections and community building.

FILIAL THERAPY WITH FATHERS IN SUPERVISED VISITATION

Emily B. Seligman (Dr. Judy Esposito) Department of Human Service Studies

While there are many effective intervention methods for women and children impacted by domestic violence, there are few programs designed to address the complex relationship between the perpetrator and the child. Filial therapy training, stemming from the Child-Centered Play Therapy approach, has demonstrated to be effective in reducing parental stress, increasing parental acceptance and understanding, and developing child self-concept when applied with special family populations. This project examines the impact of Landreth's 4-week filial therapy training on noncustodial paternal perpetrators of IPV. Three noncustodial fathers from a local domestic violence center participated in Landreth's 4-week filial therapy training while participating in supervised visitations with one of their children. Participants were asked to apply skills learned in the training sessions to their visitation times with their children. Before and after the 4-weeks of training, participants were evaluated on Abidin's Parenting Stress Index (1983) and the Male Role Attitudes Scale and participated in individual interviews. While there were no significant differences in either of the quantitative measures, themes of improved relationship with children, increased empathy, and transference of skills emerged from the interviews.

suggesting this treatment may require further evaluation for effectiveness with this population.

International and Global Studies

LINGUISTICS AND GENDER RELATIONS IN SOCIETY

Sophia K. Angst (Dr. Elena Schoonmaker-Gates) Department of International and Global Studies

Words do not translate perfectly across languages, and often language-specific terms can be highly reflective of culture. There is a strong interplay between varying syntax and semantics across languages that frame how we speak and what we speak about, for instance, specific grammatical requirements often force the recognition of possession, time, and gender. Gender noun systems are one of these grammatical distinctions that differ between languages and can alter the speaker's perception. Previous studies in this field have focused on the influence of grammatical gender systems on speakers' perceptions of nouns (Beller et al. 2015, Boroditsky et al. 2003, & Craig 1986). However, very few have addressed how this altered cognition could impact culture on a larger scale. The present study addresses this gap through a quantitative analysis of the relationship between grammatical gender and the cultural narrative of *machismo*, from an international perspective by comparing this interplay within 20 countries across the globe. While persons subscribing to machismo culture exhibit a wide range of mannerisms with a variety of sociological impacts, previous research has shown that the three variables examined in this study (the prevalence of catcalls, homicide rates, and levels of HIV) have a particularly strong relationship with machismo (Stobbe 2015, Achugar 2010, Lee 1995, Cianelli et al. 2008). The use of these indicators permitted the study at hand to measure machismo across a range of countries and a variety of grammatical systems. Preliminary results have indicated that differing gender noun systems have a strong correlation with homicide rates, and have concurrently opened avenues to further fieldwork involving street harassment and gender bias. These findings, in addition to forthcoming analyses, will add value to the conversation on socio-linguistics through an objective and international analysis of machismo and grammatical gender.

WHAT IS NOT WORKING IN LATIN AMERICA: THEMES IN U.S. COUNTER-NARCOTICS POLICY

Andrew M. Bryant (Dr. Damion Blake) Department of International and Global Studies

For decades, the United States has sought to slow the flow of drugs into the country through a variety of policies in drug-producing and drug-transit countries, especially in Latin America. While the government of the United States claims that its policies have been effective, a lot of questions have been raised as to how much of an impact U.S. counter-narcotics policies have truly had on the drug trade, as well as their economic, social, and political impacts. Using discourse and content analysis, this study seeks to identify common themes within U.S. policies in Mexico and Colombia, and analyze their effectiveness. This study finds that generally speaking, policies promoting economic and community development and fighting corruption

have had more positive effects than those providing training and support to the police and military.

A CROSS-NATIONAL ANALYSIS OF WOMEN'S POLITICAL POWER AND NORMS SUPPORTING GENDERED VIOLENCE

Colleen O. Fitzpatrick (Dr. Rena Zito) Department of International and Global Studies

One in three women worldwide experiences domestic violence. Therefore, it is important to identify predictors of violence against women globally. My research examines the influence of women's political status in predicting attitudes supporting violence against women in 162 countries. I draw on theoretical perspectives that emphasize how gender inequality influences norms supporting gendered violence by disenfranchising women and denying them full and equal participation in social life. I use data from the World Values Survey, the United Nations, the World Bank and the Inter-Parliamentary Union to examine the relationship between political power and norms supporting gendered violence. Specifically, I explain the differences between the levels of justification of violence against women cross-nationally. While these levels differ by country, men and women in each country have very similar rates of justification. In differentiating between elite political power (the percentage of women holding seats in parliament) and common political power (the year women received the right to vote), the linear regression analysis supports the significance of common political power but not elite power in the justification of violence. These results suggest that countries that wish to reduce violence against women should institute policies promoting gender equality in politics, with the support of the United States and other nations committed to ending gendered violence.

MIGRANT-FRIENDLY HOSPITALS: THE CURRENT STATE OF PRACTICE, BARRIERS, AND FACILITATORS TO MIGRANT-FRIENDLY CARE IN EUROPE

Josephine Hungerbuhler (Dr. Katherine Johnson) Department of International and Global Studies

In recent decades, a growing body of research has suggested that, in a variety of hospital settings, the health outcomes of migrants throughout Europe are often worse than those of native European citizens. Although varied "migrant-friendly" initiatives have been introduced to attempt to counter-balance these findings, migrants continue to face barriers to health care and disparities in health outcomes. This project examines existing migrant-friendly initiatives that have been initiated in hospital settings, in an effort to better define the specific characteristics that may render these initiatives more or less successful. To this end, a meta-analysis of health and policy literature was conducted, using databases and specific search terms to create criteria for analysis. Results were coded and assessed quantitatively using Stata 13. The articles were evaluated to determine relevance to the study, using criteria that identified articles that specifically studied migrant health care at the hospital level in Europe over the past 10 years, which identified 83 relevant articles for the study. Of those articles, 76% discussed barriers to migrant-friendly care as opposed to 57% which discussed facilitators. Within the articles that discussed either barriers or facilitators, 45.5% of them discussed barriers but not facilitators while only 8% discussed facilitators but not barriers. Major topics throughout the articles which

discussed their relation both to barriers and facilitators to health care access included socioeconomic status, geographical area of the study, and specific populations. Results demonstrate that these recurring topics are factors important to the adoption process of migrant-friendly policies due to their frequency throughout the articles. The frequency of these topics indicates that these are variables that hospitals need to address in their decisions to adopt or reject migrant-friendly health care. The results of the research analyzed suggest that hospitals are more likely to decide to adopt or reject a new innovation in migrant-friendly care based on the barriers, such as aspects of the recurring topics in the literature, rather than the facilitators to adoption.

STABILITY IN THE MIDST OF CHAOS: THE DETERMINANTS OF JORDAN'S REFUGEE POLICIES, 2012-2016

Benjamin C. Lutz (Dr. Jason Kirk) Department of International and Global Studies

Violence in the Middle East has forced millions to seek refuge in Jordan, creating a prolonged refugee crisis. With over half of its population now comprised of refugees, Jordan has radically altered its refugee policy by allowing some Syrian refugees access to work permits through a highly unusual concessionary World Bank loan, conceived in partnership with the United Nations. Seemingly, Jordan has realized it does not have the capacity to continue an unsustainable policy of housing arrivals in isolated refugee camps with no legal means of participating in the Jordanian economy. Jordan has long been a haven for Palestinian refugees and others, including Iraqis, fleeing conflicts across the region. But the unprecedented scale of the Syrian refugee emergency has brought the kingdom to a turning point in its policies, through its engagement with the international organizations and the material incentives offered for adopting a new approach. This project analyzes the determinants of Jordan's refugee policies in historical context, but focuses particularly on developments in 2012-2016 that have culminated in its unprecedented work permit initiative for Syrian arrivals. This project contributes to a better understanding of conflict and diplomacy in the Middle East, and the influence of international organizations on the evolution of state-level policies in the global refugee protection and assistance regime.

TORTURE IN TIMES OF TERROR: STATE-SPONSORED TORTURE IN NIGERIA DURING THE BOKO HARAM INSURGENCY

Bridget E. Smith (Dr. Safia Swimelar) Department of International and Global Studies

Despite global efforts to encourage the protection of human rights, states sometimes forgo compliance with human rights norms. The presence of a terrorist threat, in particular, creates a context in which states may implement counter-terror tactics that violate fundamental human rights. This study looks at the case of the Nigerian Security Forces' fight against Boko Haram from 2009 to 2015, and analyzes several different factors to explain the facilitation of the systematic use of state-sponsored torture in counter-terrorism. These factors are divided into two subsections: internal, or state-level, factors; and external, or international, factors. The internal factors that this study analyzes are: Nigeria's history of torture; the severity of Boko Haram's threat to state stability; and domestic politics, including Nigeria's legal system, partisan politics,

presidential discourse, and civil-military relations. These internal factors establish the domestic context in which the Nigerian forces have executed the systematic use of torture in their counter-terror tactics. Due to the multifaceted nature of human rights compliance, this study also takes into account the impact of external forces. This analysis looks at international assistance for counter-terrorism along with pressure from external actors, including transnational NGOs, foreign states, and inter-governmental organizations. These external forces situate Nigeria within the international system and explain how outside actors have impacted Nigeria's lack of compliance with human rights norms. This paper argues that the threat posed by Boko Haram combined with the interplay of the historically militarized government and lack of pressure for human rights reform from the international community has prevented compliance with the anti-torture norm.

Management and Entrepreneurship

PREDICTIVE MODELING IN HIGHER EDUCATION FUNDRAISING

Ramon M. Brandt (Dr. Haya Ajjan) Department of Management and Entrepreneurship

This study explores how predictive analytics can be applied in higher education to increase the financial contributions of donors through targeted fundraising. Fundraising is a critical source of capital for public and private educational institutions to help them build resource independence. With multiple organizations competing to attract contributions from donors, it is important to identify donors who are most likely to contribute financially to their educational institution. The purpose of this study is to build a predictive model using logistic regression to classify donors who are most likely to give at a private university. The data for the analysis is an anonymized sample of nearly 20,000 alumni in a small private university in the United States. The variables evaluated include information regarding the alumnus education (e.g. major and minors), employment, event attendance after graduation, life stage, as well as activities and memberships while studying. The analysis will begin with data cleaning and scrubbing, followed by statistical exploratory analysis and visualization to confirm all logistic regression assumptions are met, data will then be split into training and validation sets, and finally a classification model will be run and evaluated based on its performance on the validation dataset. The results of this study will help university administrators target key donors to increase their donations, while minimizing their fundraising cost.

NORTH CAROLINA GLOBAL ENGAGEMENT SNAPSHOT

Jennifer L. Faig, Rachyl E. Jackson, Sydney R. Lawton, Maria Hadaya, & Alice M. Pittman (Dr. Haya Ajjan) Department of Management and Entrepreneurship, Center for Organizational Analytics

This scholarship of learning sought to assist the North Carolina Coalition for Global Competitiveness, a group of state leaders in the government, business, education, and community, in answering the question regarding the level of global engagement across the state of North Carolina. In order to accomplish this goal, the Center for Organizational Analytics interns developed a dashboard, a compilation of data visualizations, to display data regarding international indicators identified by the coalition. The indicators spanned one of six strategic areas the coalition developed: leadership, global brand identity, global infrastructure and logistics, global economic development, cross cultural competence, and collaboration

and research. The building of the dashboard combined the efforts of faculty and students from across the school's disciplines, including media analytics, business analytics, statistics, and computer science. The dashboard seeks to support state leaders in identifying how North Carolina can make the most of global economic and education opportunities, as well as create more informed global citizens. The data visualizations that comprise the dashboard help the state leaders to recognize opportunities for beneficial change and make strategic, data-driven decisions. The project began with data collection from state-level and national government agencies, such as the Census Bureau and the Twitter API. The data was then organized and used to develop powerful visualizations using Tableau software. Currently, the data is being restructured into an SQL database to provide for a more efficient way to update the data annually. The dashboard was published in October of 2016 and it is the center's hope that state leaders will use this dashboard to make more informed decisions to better North Carolina for all of its citizens.

Marketing and International Business

EXPLORING MILLENNIALS' SOCIAL MEDIA USAGE AND GREEN CONSUMPTION

Stephanie A.N. Bedard (Dr. Carri Tolmie) Department of Marketing and International Business

Millennials, born between 1980 and 2000, are the first generation to mature in an internationally-interdependent world. Their upbringings were shaped by the Internet, digital communication, and globalization. For these reasons, millennials grew up exposed to ethical issues stretching beyond their home countries, including concern for the environment. Today, research into the sustainable consumption patterns of millennials is important due to this generation's increased spending power and prominence in the world's workforce. Several studies have investigated millennials' perceptions of sustainable or "green" products, and the factors that make these products appealing. Yet, insight into the green purchase intentions of this demographic and influencing factors is lacking. This study uses a cross-cultural comparison of millennials in the NAFTA countries (the United States, Canada, and Mexico) to investigate the influence of social media usage and online interpersonal influence on green purchase intentions. Additionally, culture was investigated as potential moderator in these relationships using dimensions from Hofstede's consumer culture theory framework. Data were collected using a 62-item online survey administered to millennials in the United States, Canada and Mexico. Results will have important research and managerial implications for marketers, sustainable business strategists and policy-makers.

FOREIGN MARKET ENTRY: ADAPTATION AND PARTNERSHIPS AS A SUCCESSFUL STRATEGY FOR FOREIGN FOOD BUSINESSES

Chloe Chambon (Dr. Lawrence Garber) Department of Marketing and International Business

Research conducted in international business has shown that marketing adaptation and partnership with local businesses have been two different strategies assessed and executed separately by firms when entering foreign markets. There is also very little research examining the correlates of adaptation and partnerships as one single strategy in foreign market entry. This study provides a formal investigation of the conditions under which both strategies can be used

concomitantly in order to reduce uncertainty, gain knowledge and thus successfully enter a foreign market. This research design involves a series of in-depth personal interviews with owners of foreign food businesses willing to start or having succeeded in starting a business in the United States. Preliminary results suggest that successful concomitant implementation of both strategies is dependent on the company's ability to select and partner with the right existing local business upon foreign market entry. This thesis contributes to understanding the decision-making process for entering foreign markets.

HOW COMPLEXITY-INDUCED CONSTRUAL AFFECTS THE PERCEPTION OF ADVERTISING MESSAGES

Gabrielle E. Corner (Dr. Kacy Kim) Department of Marketing and International Business

The current research examines the varying effects of different message forms in advertising – whether the ad message is easy-to-process or difficult-to-process – on advertising persuasiveness, as measured by attitude toward the advertisement and purchase intentions. For example, when a consumer sees a percentage off discount ad message (i.e., difficult-to-process), she may react differently than if the ad message was offering a dollar off discount (i.e., easy-to-process). Building on psychological distance and construal level theory (CLT), we propose a different level of cognitive process (i.e., complexity) varies psychological distance: an easy-to-process deal takes shorter to judge on purchase intentions than a difficult-to-process deal. Through an understanding of psychological distance and CLT, this research seeks to examine whether a difficult-to-process discount (an easy-to-process discount) advertisement is likely to derive high-level (low-level) construal. In the context of consumer decision-making, the researcher expects that those consumers who receive a difficult-to-process discount promotion (e.g., percentage discount) on a product would prefer advertising messages that correspond to abstract construal—benefit-appeals and quality-appeals—whereas those who receive a easy-to-process discount promotion (e.g., dollar discount) on a product would prefer advertising messages that correspond to concrete construal—attribute-appeals and price-appeals. In Study 1, complexity (percentage-discount vs. dollar-discount) was tested on construal level features (feasibility and desirability). There were 192 participants from Elon University, Bryant University and University of Georgia. Studies 2 and 3 had 134 and 133 participants, respectively, from Bryant University. In Study 2, complexity was tested on the duration of the promotion deal (temporal distance). In Study 3, complexity was tested on geographical store location (physical distance). Overall, the researcher expects to propose complexity as a new psychological distance.

THE EFFECT OF HOMEPAGE COMPLEXITY ON BRAND PERCEPTION, ATTITUDE AND CHOICE: A FACTORIAL DESIGN

Jonas Fries (Dr. Lawrence Garber) Department of Marketing and International Business

While the primary focus of many consumer brands' content marketing efforts has shifted towards social media platforms, the homepage remains an important source of consumer information. Yet only a sparse literature has examined its efficacy. The particular focus of this research is informational and/or visual homepage complexity. Prior research examining its effects on a range of dependent variables shows mixed results. Theory and some empirical

research argue that moderately complex stimuli would have a greater effect than simple or highly complex stimuli. However, some other empirical research finds that simple stimuli have the greatest effect while still other studies find highly complex stimuli are the most impactful. In this research, we propose to contribute additional empirical evidence to the question of optimal complexity levels while extending it to an examination of homepage complexity's effect on consumer behavior. Fewer still of the studies that comprise this sparse literature examine homepage complexity's effect on consumer behavior. In a 3 x 2 between subjects design, informational complexity is manipulated at three levels (low, moderate, high) and buyer purchase involvement at two levels (high, moderate). Stimuli are invented plausible homepages for a "heretofore unknown Australian university recruiting US students," a category evoking high involvement, and a "heretofore unknown European brand of athletic shoe about to launch in the US," a category evoking moderate involvement. Each of these homepages is executed at three levels of complexity according to the number of visual features and the size of the blocks of text they exhibit. Subjects will comprise a convenience sample of US university students. Each experimental participant is exposed to the homepage of one of the two product categories at one level of complexity. A range of dependent variables (purchase intent, attitude towards the website, attention towards the website and attitude towards the brand) will be considered. Preliminary results are to be presented. Theoretical and managerial implication are to be discussed.

AGILE SALES: AN EXPLORATION OF AGILE METHODOLOGIES IN SALES

Lilian R. Guenzel (Dr. Erin Gillespie) Department of Marketing and International Business

As most companies today work in a highly dynamic environment, they not only need new products and services but also an innovative functional sales process. Companies that create an agile environment can create more innovative products and services. The idea of applying agile methodology in all business sectors to support innovation, was discussed in a recent Harvard Business Review article by Rigby, Sutherland, and Takeuchi (2016). Over the past 25 to 30 years, agile methodologies have completely changed the process of software development. Recently, they have started to spread across a broad range of industries and functions. Yet, scant research has investigated the use of agile methodologies in the sales industry. An agile adoption allows the organizations to increase the quality and speed of new products into market as well as boost the motivation and productivity of their teams. Moreover, by continuously adapting to customers' changing priorities, agile improves customer engagement and satisfaction by bringing products and service faster, more predictably, and more customer-centric into the market (Rigby et al., 2016, p. 43-45). As sales departments are struggling to implement innovative sales processes, and as agile methodologies have a proven record of improving the processes of software development, the purpose of this study is to determine if sales management could adapt these methodologies and apply them in the sales context. Specifically, this research seeks to determine what types of agile methodologies (if any) sales companies are currently using. Further, it is essential for sales organizations to understand how agile methodologies from the software development industry *could* be implemented, as well as uncovering the benefits and impediments to such an implementation in sales. These research questions have been examined through multiple in-depth, semi-structured interviews with sales representatives and agile experts.

THE RISE OF THE CRAFT BEER INDUSTRY IN THE UNITED STATES: CAN THIS INDUSTRY ALSO THRIVE IN FRANCE?

Théo Hardy (Dr. Moorman) Department of Marketing and International Business

Over the past three decades an increasingly fast moving trend has appeared in the beer industry in several parts of the world: craft beer. This movement advocates for deep brewing knowledge and the use of quality ingredients in order to create tastiest beer. The number of microbreweries in the world has increased dramatically (5,000 breweries in the United States in 2017, brewersassociation.org) even though the beer market seems to be largely dominated by mass-produced beers. Craft beer producers stand against all big beer manufacturers and are able to win market shares in this highly competitive industry. The craft beer scene is a fast expanding one, it attracts more and more people every day. It is full of passionate individuals ready to dedicate their time and money in order to produce the best beer for consumers willing to pay more, drink less, but drink better. Our central point in this research paper is to understand how and why the craft beer market is expanding at such a quick rate in the United States and to determine if this expansion is possible in France. The preliminary results taken from online information, specialized books and interviews of key actors of the craft beer scene (brewmasters, brewery owners) lead to the conclusion that craft beer has a bright future both in the USA and in France.

WHAT IS THE POTENTIAL OF BUSINESS MODEL INNOVATION IN THE TRANSPORTATION AND LOGISTICS INDUSTRY?

Anette K. Koehler (Dr. Alisha Horky) Department of Marketing and International Business

In the past, leading logistics service providers have leveraged their global freight networks to offer advanced services to their customers. At the same time, the transportation and logistics industry has to react to market forces influencing global trade and means of transportation. Literature review and empirical research show that technological forces exert the biggest pressure on logistics service providers in the 21st century. Firms are required to examine current trends for their implications and future potential for transportation and logistics. To build sustainable growth in reshaping markets, logistics service providers must leverage emerging technology to develop new solutions addressing the customers' demand for increasingly transparent and efficient logistics services, while adhering to given regulations. The use of organized innovation procedures focusing on opportunity exploitation and business model adaptation can be a major success driver for logistics service providers. To explore the business model innovation approach, the author conducts a company case study on DB Schenker, a leading German logistics firm. Interviews with employees from different levels and divisions in Germany, Australia and the US provide information on global innovation management in a large organization and the implementation of new solutions, taking regional differences into account. The findings show how DB Schenker established an in-house innovation team to investigate trends early and collaborate with selected external partners to develop new logistics solutions. E-commerce, the digitalization of workflows and platforms, big data analytics and automation are key developments DB Schenker currently investigates. By implementing new solutions and adapting existing processes, DB Schenker reshapes its business model to respond to market

developments. The key findings regarding the potential that business model innovation has for the transportation and logistics industry will be presented.

Mathematics and Statistics

EFFECTS OF AN UNDERGRADUATE TEACHING ASSISTANT POSITION ON PEDAGOGICAL MATHEMATICAL KNOWLEDGE

Josselyn J. Geyer (Dr. Aaron Trocki) Department of Mathematics and Statistics

Pedagogical mathematical knowledge (PMK) as defined by the Preparing Teachers to Teach Mathematics research and development team at North Carolina State University (2015) has six aspects. Three are highlighted in this study: 1) understanding students' potential misconceptions and accommodating for differences in learning; 2) designing tasks which are exploratory or open-ended; and 3) considering the real world contexts used in tasks. Literature on best teaching practices shows that PMK is an essential area that must be developed in pre-service mathematics teachers. This research documents what aspects of PMK a pre-service secondary mathematics teacher gained as an undergraduate teacher's assistant in an elementary mathematics content course entitled, Geometry and Data for K-8 Teachers. Observations over the course of the teaching assistant experience were documented in the form of weekly journals that tracked content and pedagogical techniques found in the course as well as the role of the TA in and out of the classroom. The journal entries were analyzed and interpreted qualitatively based on a coding scheme that documented instances of increased PMK. These instances were recorded and interpreted along with implications on teaching practices going forward. Changes to future teaching practice are summarized and represented in the form of written mathematical tasks and accompanying instructional plans.

HIGHER DEGREE POLYNOMIALS AND THEIR SOLVABILITY BY RADICALS

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For about 500 years, formulas have existed to find exact roots to quadratic, cubic and quartic polynomials. However, it was proven later that not all solutions to quintic equations can be found exactly. This property is also called being "solvable by radicals," which means a polynomial's roots can be found from its coefficients, radicals (like square roots) and the four basic arithmetic operations. As a result, in the 20th century, a method was created using a property of each function called its Galois group in order to determine which degree five polynomials could be solved exactly and which could not. This project expands upon this discovery by exploring degree six and seven polynomials. By using computer software, the Galois group of a degree six or seven polynomial can be determined by only using two and one resolvent polynomials, respectively, thus improving upon prior methods which use three or more resolvent polynomials. From this information, it can then be determined whether or not the polynomial is solvable by radicals. Furthermore, this project also investigated calculating the Galois group of polynomials that factor, a task that was previously impossible using existing software. Further research can explore higher-degree polynomials starting with degree eight polynomials.

THE CONSTRUCTION OF FRACTALS OF ARBITRARY DIMENSION

Nathan M. Pool (Dr. Jeffrey Clark) Department of Mathematics and Statistics

Have you ever gazed into a work of art or a coastline on a map and noticed a repetitive pattern the closer that you observe it? This distinct quality is characteristic of fractals. These geometric figures diverge from the structure of traditional polygons with their fractional dimension. Not only do they have dimensions of non-integer value, but they have self-similarity. Kenneth Falconer addressed an equation for dimensions of self-similar sets – the iterated function systems used to construct fractals from initial figures. My investigation uses this equation by taking into account the number of similarity transformations to produce a fractal and the contraction factor used in the transformations. I began this research by writing an algorithm to construct fractals out of a regular polygon corresponding to the number of vertices inputted. The end product of this research will have the ability to construct fractals of any given dimension using just one function. With access to this data, people will be able to more adequately analyze the correlation and relationship between fractals' aesthetic characteristics and their corresponding dimensions. I hope to push this research even further by examining the connection between dimension and sound in the area of fractal music. As many classical composers made use of self-similar themes in their music, perhaps there is a way to portray that self-similar composition technique through the mapping fractals' coordinates to corresponding frequencies. Furthermore, dimension has the potential to be connected to the sound just as it has a connection to self-similarity. The existence of a successful algorithm for creating fractals of arbitrary dimension gives access to countless fractals varying in dimension in any way that researchers desire.

VACCINES AND BACTERIAL SHIELDS: MATHEMATICAL MODELING OF DENGUE FEVER

Michelle A. Rave (Dr. Crista Arangala & Dr. Karen Yokley) Department of Mathematics and Statistics

Dengue fever is a virus that is transmitted by mosquitos for which there is no cure. There are four types of dengue that have differing antigens, leading to different antibody development in the human body. Exposure to one leads to immunity to that type, but increased susceptibility to the others due to the similar, but not identical antibodies. This leads to potential problems with vaccines, which help the body create antibodies in preparation for infection. Mathematics can be used to model the spread of dengue and other diseases. Mathematical modeling provides a good way to examine how potential vaccines could affect the spread of dengue without testing them on large numbers of people. Models simulate the spread of the disease based on previous data and research. The mathematical models that we are exploring are based on previous models of dengue. This research project attempts to adapt current models to better model the interactions between types and then to incorporate the effects of vaccines that are currently in development. These models look at the rates at which people flow between four categories which include able to catch the disease, exposed to the disease, but not showing symptoms, able to pass the disease to mosquitos, and recovered from the disease, and the rates at which mosquitos flow between three categories including able to catch the disease, exposed to the disease, but unable to transmit it, and able to pass the disease to people. The overall system of equations is used to predict the

effect of possible prevention methods. These methods include a bacteria called *Wolbachia* that blocks mosquitos from transmitting dengue and vaccines. Both of these options have potential to hinder or stop the spread of dengue, but the effectiveness and costs are explored through the mathematical models.

SIMULATIONS ON A MATHEMATICAL MODEL OF DENGUE FEVER WITH A FOCUS ON MOBILITY

Kelly A. Reagan (Dr. Karen Yokley & Dr. Crista Arangala) Department of Mathematics and Statistics

Dengue fever is a major public health threat, especially for countries in tropical climates. Often, dengue fever goes undiagnosed or misdiagnosed, which further causes the disease to transmit across human and mosquito populations. A mathematical model was developed to investigate the spread of dengue fever in neighboring communities by combining the structure of two models previously researched. The first model studied generally analyzed the transmission of the dengue fever across a constant population. The second model looked at how malaria spread across interacting communities; however, since malaria is also a mosquito-transmitted disease, the overall dynamics of the model could be used in a dengue fever model. By combining the two models, simulations of the transmission of dengue fever in neighboring communities of differing population sizes were conducted. Since Sri Lanka has a high number of dengue fever cases, special simulations were run to understand the spread of the disease between communities in Sri Lanka. The simulations using the combined model showed that initial infection details and relative population size may affect the dynamics of disease spread. Furthermore, an outbreak in a highly populated area may spread somewhat more rapidly through that area as well as neighboring communities than an outbreak beginning in a nearby rural area.

SYMMETRIES OF DEGREE 8 POLYNOMIALS

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The notion of solvability by radicals is a fundamental area of mathematics that has been around for hundreds of years. While mathematicians through the years 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 could be solved. Any polynomial whose roots can be expressed using only the coefficients, basic arithmetic operations, and radicals are 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. Using computer programs, we developed an algorithm that computes a variety of characteristics to determine what group of symmetries a polynomial exhibits. By determining the group of symmetries, we can then determine whether a polynomial is solvable or not. When input with a degree 8 polynomial, the algorithm returns a corresponding Galois group. These groups, named after the mathematician, 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 unique 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.

INVESTIGATING STANDARDS-BASED GRADING IN A MATH I CLASSROOM

Melody R. Titus (Dr. Aaron Trocki) Department of Mathematics and Statistics

The goal of this study is to determine whether mathematics students develop from a fixed mindset to a growth mindset under the instruction of a teacher employing standards-based grading (SBG). Fixed mindset is the belief we have a set amount of intelligence, abilities and talents and that will never change. Meanwhile, growth mindset is the understanding that through hard work we can grow and develop our abilities and talents. Standards-based grading is a grading method based on student proficiency in a number of learning goals or standards. A Math I class in a high school in Forsyth County, North Carolina, whose teacher implements this assessment model was observed during a semester and a Mindset Quiz was given to the students in this class. The Mindset Quiz was created by Carol Dweck, a Stanford psychologist who has studied extensively the concepts of growth and fixed mindsets. In this case study, the unit of analysis is one class and their collective mindset under the setting of math instruction that incorporates SBG. The classroom was observed to see what aspects of the teacher's instruction might impact student mindsets. Because SBG causes students to focus on proficiency on learning goals instead of test grades or course grades, it was possible that SBG could influence whether a student developed a growth mindset rather than a fixed mindset. This investigation measured changes in students' mindsets from the beginning of the course to the end of the course. Data were also collected in the form of teacher interviews to gain deeper understanding of SGB and promotion of a growth mindset. Results are still in the process of being collected and analyzed. Findings may help teachers see benefits from this assessment method and how it may help encourage growth mindset in students.

Music

EVOLUTION OF THE AMERICAN MUSIC FESTIVAL

Isaac J. Bates (Professor Clay Stevenson) Department of Music

This study explores notable advancements of music festivals in United States over the last half-century and analyzes how breakthroughs in music technology, promotion, and booking have enhanced the way these festivals are designed and presented to audiences. A close examination of advertising, performances, and technology at five of the United States' most significant music festivals over multiple years revealed a number of patterns and trends. For example, higher ticket sales were found at festivals that booked a broad range of genres and were sponsored by major corporations. Also, the development of technologies such as digital mixing consoles, line-source audio systems, and LED lighting led to a wider variety of festival locations and more sophisticated shows due to their efficiency, light weight, and ease of use. These changes provide

clues and examples to assist future designers in reducing challenges and maximizing the success of their festival and concert development. In order to realize these challenges and explore solutions, this study documents the process of organizing a small, free music festival on Elon University's campus. Moreover, writing and submitting advertisements in local newspapers and social media outlets, building technical specification requirements, booking local and out-of-state artists, creating a performance lineup, seeking sponsorships from organizations, and raising funds to support the event are jobs that are relevant to both the largest American music festivals and the aforementioned Elon-based event. The conclusion of this research reveals that the most successful music festivals require performances from a variety of genres to attract a wider audience, strong funding from an established sponsor in order to afford the most advanced equipment, and a venue that suits the attitude of the festival and can comfortably support the target audience capacity.

THE EVOLUTION OF GENDER PORTRAYAL IN ITALIAN OPERA: THE CASTRATI AND OPERA SERIA IN THE EIGHTEENTH CENTURY

Bethany H. Beckham (Dr. Victoria Fischer Faw) Department of Music

The modern opera, a combination of music and theater with ideological roots in the ancient Greek drama, first formed and flourished under Italian patrons in the early seventeenth century. Not until the eighteenth century, however, did the conceptual become concrete in opera houses across Europe. Poets, composers, and patrons collaborated to portray sophisticatedly simplistic storylines in front of adoring audiences. To convey this refined operatic genre, Italian musical patrons sought top-notch performers in the *castrati*. The castrati were musically talented males, castrated before puberty to retain the high vocal range of their childhood. The result was a unique voice with the ability to surpass any natural singing voice in power, range, and timbre. Parents across Italy sent their gifted sons to attend elite conservatories in hopes of fame and fortune, a desire fueled by the *castrato* fascination of eighteenth-century Italy. *Opera Seria*, which dominated Italian art culture from 1720-1770, describes a refined operatic style of standardized musical, thematic, and formal characteristics. This musical era also featured the use of unconventional gender portrayals, such as women in trousers, *castrati* portraying either gender, and sexuality used as a tool to advance the plot. Especially in a time where noble patronage financially controlled the artistic scene, it is worthwhile to understand the cultural context behind the gender roles portrayed onstage. Through musicological research and its applications in the study and performance of the relevant literature, this presentation will connect the culture, opera, and gender issues surrounding *Opera Seria* by highlighting major composers and operatic pieces of the day.

A PRODUCER'S STAMP: EXPLORING THE ROLE IN CREATING AN ALBUM

Anders N. Borg (Dr. Todd Coleman) Department of Music

A producer's role in the creation of an album can vary based on the intended product they wish to create with the artist. The level of involvement can be a combination of several different things—famous producers of all genres have been known to utilize their own talents instrumentally or vocally, connect artists with musicians and engineers to best create a product

that encompasses the musical vision of the project, or oversee and influence decisions that are made by others involved in the production. Producers such as Pharrell Williams and Mark Ronson produced themselves as actual artists, allowing for the complete control over every aspect of their albums, while producers such as Rick Rubin and Dr. Dre played a more overarching role over the production of their various projects. Before beginning the process of creating an EP and discovering a stamp of my own, my research involved critically listening to and analyzing albums to identify what sorts of ways a producer can create their own “stamp” on a particular artist or album. The next stage of this project involved the production of an EP of an artists’ music, exploring the role I play as a producer in the creation of an album. Referencing and using the influence of other producers’ processes and styles contribute to the clarification of my own personal “stamp” on an artists’ album.

Performing Arts

ELON MONOLOGUES: A CREATIVE EXPLORATION OF LIFE, CULTURE, AND DIVERSITY AT ELON UNIVERSITY

Ciara M. Corcoran (Dr. Susanne Shawyer) Department of Performing Arts

Elon University is working on a decade-long strategic plan with the aim to create the best campus culture for its students. This plan specifies eight themes that the university hopes to improve upon over the next few years. The first of these themes is “an unprecedented university commitment to diversity and global engagement.” My research explores what experiences related to race, class, gender, and identity Elon students find most meaningful and how sharing those experiences through performance can contribute to the campus conversation on diversity. In order to identify and explore these experiences within the greater campus community, I conducted interviews to uncover themes and shared experiences among students. Several themes arose through these interviews: diversity, social media, global engagement, and social culture. Additionally, students discussed their transition processes from high school to college and then their personal growth during their time at Elon. I crafted the interviews into monologues, similar in style to *The Vagina Monologues* by Eve Ensler. These personal stories were translated into a dramatic work in order to highlight the student issues identified in the interviews. Additionally, with a dramatic reading of the work, I hope to provoke empathetic audience response and encourage conversation among community members. This research serves to promote conversation about diversity and provides a model for creative dramatization about undergraduate Elon student experiences.

DANCE INJURY PREVENTION ASSESSMENTS: A SERIES OF CASE STUDIES

Stephanie C. Pittman (Professor Lauren Kearns) Department of Performing Arts

Numerous studies have shown 70 to 90 percent of dancers experience a dance related injury at some point in their career. Dancers have unique movement restraints due to the rigidity of different techniques, which often cause unique injuries. Dance Medicine Physical Therapists have been working to create injury prevention protocols for dancers, but such a program requires

access to a physical therapist. This research project, Dance Injury Prevention Assessments: A Series of Case Studies, focuses on creating injury prevention assessments in a handbook format that any dance teacher, choreographer, or dancer can use to create an exercise program to target a dancer's muscular imbalances before an injury occurs. There are three different assessments created for the following categories of dancers: recreational, pre-professional, and professional. A literature review on common dance injuries was completed to determine the proper exercise tests to be included in the assessments. Assessments were determined based+ on injuries and level of expertise required to administer the test. Three case studies, a female recreational dancer with chronic ankle instability, a female pre-professional dancer with chronic patella instability, and a male professional dancer with chronic hip pain, demonstrate how different dancers would complete the assessments based on common muscular weaknesses a dancer would have with those specific problems. Detailed exercises with progressions were determined for each test. This project will provide a functional assessment to create a cross-training program for dancers to help prevent injuries.

THE FLOWER OF THE FERN: ADAPTING A SLAVIC FOLKTALE INTO AN AUDIOPLAY

Killian J. Poplyk (Professor Kevin Otos) Department of Performing Arts

Over the past two years of my Elon College Fellowship, I have been adapting and produced a traditional Slavic folktale entitled *The Flower of the Fern* into an audioplay using the pool of talent available at Elon University. The end goal of this project was to produce and distribute this audioplay online through free download and streaming. Unlike other more visual media an aural medium such as an audio play is much more readily accessible and able to be listened to while on the go. Additionally, the audioplay still remains as a viable form of entertainment, as can be seen in the recent rise of the podcast's popularity over the last several years. My process thus far has consisted of research into folk studies, writing and adaptation of a traditional Slavic folktale, casting and directing voice actors, creating a customized sound design, and underscoring it with original music. One of the primary objectives when starting this project was to maintain a sense of cultural authenticity, while at the same time establishing a balance so as to not make it too alienating towards a contemporary audience. In this regard, I acknowledge that I have not been absolutely faithful to the original source material in order to establish a more cohesive and palatable narrative. However, I believe that the approaches taken through directing actors of different levels of experience and training, sound design, and music will have ultimately benefited the end product. By observing the process and creative choices I have made, others may benefit and become better prepared when producing or directing their own audio production.

CLOTHING DOTH MAKE THE MAN

George B. Whitaker (Professor Jack Smith) Department of Performing Arts

We want to look at the intersection of the actor's craft with the costume designers work in developing a three dimensional character that lives and breathes on stage. This work also crosses the boundaries of performance and touches on the idea of the costume we wear in our everyday

lives. It is important because as artists in performing arts we are forced by economic necessities to distill the trust that years of work would build into a 2-week rehearsal process. Finding short hand and solid guidelines to help streamline this process would be invaluable not only to me but also to others starting in this field. I am conducting a series of interviews developing a baseline of data that supports ideas and processes for my future working relationships in the performing arts. I will show how clothing transforms the actor and how that transformation informs the character. I have also draw data and information from a variety of books and articles about clothing's use in society. The ideal format would be a lecture rather than a poster session, as I will be doing a performance piece that shows how simple clothing choices will transform the same actor into many characters.

Philosophy

WHOSE WORLD IS THIS?: TROUBLING WHOSE STORIES ARE WELCOMED INTO THE ACADEMY BY BRINGING RAP INTO THE CLASSROOM

Alonzo Cee & Mary Frances Foster (Dr. Stephen Bloch-Schulman) Department of Philosophy

Two students reflect and make sense of their experiences in a course that created dangerous spaces (Yancy, 2015) for students to question whose world this is (Jones & Phillips, 1994) in the academy and in the America around them. This class utilized the stories of people of color, as rappers and as authors of academic texts, as well as the stories of the students in the class to explore the realities of race and the history of racial oppression in America. The examination of racial inequality creates a dangerous space for white students as they grapple with their own racial privilege that they may be ignoring (Whitt, 2015) and the exploration into sexism in some rap music creates a dangerous space for all students, but in very different ways. In particular, this course aimed to explore the US as a site of racial and gender inequality and oppression through practicing the art of rap and by welcoming lived experiences into the classroom. We offer our reflection on this class, and what made it successful from our own perspectives as students and from each of our lived experiences as a white female and Black male. We hold, through the lens of standpoint theory, that each of our perspectives adds value due to how our own identities inform our understanding of the success of this course (Werder & Otis, 2010).

A LEADERSHIP PRIZE PROJECT: MENTORSHIP AS A MEANS OF FEMALE EMPOWERMENT: A RESOLUTION TO LESSEN GENDER INEQUALITY ON COLLEGE CAMPUSES

Rebecca B. Nipper (Dr. Stephen Bloch-Schulman) Department of Philosophy

In the interest of finding a possible resolution to the issue of gender inequality on college campuses, I combined research on the issues of sexism most relevant to college females, research on the value of mentorship both between women and for women, and relevant leadership theories to create a mentorship program that addresses these issues and encourages female empowerment. This evolved into the piloting of a female mentorship program, FLAME, at Elon University. The FLAME Mentorship Program (Female Leaders for Activism, Mentorship and

Empowerment) focuses on increasing leadership and professional skills in college-age women. Participants work together both in mentor/mentee pairings and as a group to complete an activism project which will both help them address the issues they face as college-age females and also allow them to gain professional and leadership skills as they give back to their local community. The program's aim is to see an increase in professional confidence, stronger working relationships, and greater leadership skills in the program's participants. My current research on this topic is focused on assessment. The goal is to measure the ways in which the participants benefit from the FLAME mentorship program and if this type of mentorship program is an effective way to provide relief for college-age women who struggle to succeed because of issues surrounding gender inequality and the lack of women's access to leadership skills and positions.

Physical Therapy Education

RELATIONSHIP BETWEEN FUNCTION, QUALITY OF LIFE AND BALANCE IN PERSONS WITH CHRONIC ANKLE INSTABILITY

Olivia Brazer & Sydney Solomon (Dr. Srikant Vallabhajosula & Dr. Jane Freund) Department of Physical Therapy Education

Chronic ankle instability (CAI) is often the result of an inadequately healed ankle sprain. Following injury, it is common for an individual's sense of balance to be impacted (due to ligament damage). Depending on the severity of the injury, function and quality of life can also be affected. The current study investigated the relationship between subjective outcome measures of function and quality of life, and objective measures of static and dynamic balance. Participants were divided into three groups: 1) CAI group (n=18; age 22.4 ± 2.8 years) consisted of individuals with a history of at least 1 significant ankle sprain with feelings of "giving way, and/or instability", and/or recurrent sprains, 2) Copers (n=15; age 22.4 ± 3.2 years) have also sustained 1 significant ankle sprain, but are able to return to their pre-injury levels without any residual pain or symptoms and 3) control group (n=18; 22.2 ± 3.0 years) consisted of individuals who had never endured an ankle injury. Static balance was tested using single leg standing on the Biodex Balance System platform set to 4 levels of varying stability. Dynamic balance was tested using Y-balance system. Participants also completed the Foot and Ankle Ability Measure (FAAM) and the Foot and Ankle Outcome Score (FAOS) surveys to indicate their function and quality of life. For CAI group, the FAOS quality of life subscale was negatively correlated with sway index and area when the platform was stable (both $r \geq -0.52$; $p < 0.026$). Also the FAOS activities of daily living and pain subscales negatively correlated with maximum reach in the posteromedial direction of the Y-balance test (both $r \geq -0.49$; $p < 0.037$). For Copers, the FAOS symptoms subscale negatively correlated with sway index when the platform was stable ($r = -0.54$; $p = 0.037$). For Controls the FAOS symptoms subscale showed negative moderate significant correlation with sway index and area on the very unstable platform level. Our findings indicate that for those with a history of ankle sprain (CAI and Copers), subjective measures seem to be related to performance on the least challenging static balance test and also the dynamic balance test. Subjective measures of quality of life and function do not seem to be related to more challenging static balance tests.

Physics

QUANTIFYING *E. COLI* BACTERIAL CELLS USING EZAFM

Grace Godsy (Dr. Krithika Venkataramani) Department of Physics

The use of the atomic force microscope (AFM) has been used to study the surfaces of bacterial cells to ultimately assist scientists in obtaining information regarding their structure and biochemical makeup. The device used in this study, the ezAFM, has been specifically designed for student operation as an introduction to atomic force microscopy. Samples whose known characteristics and analyses have been revolutionized through the use of this technology include, in particular, DNA, proteins, and microbial and mammalian cells. The goal of this specific research project is to image *E. coli* cells using the Atomic Force Microscope and to analyze these images to determine bacterial concentration in specific solutions. To do this, we use the ezAFM in which atoms of a sharp tip mounted on a cantilever inside the ezAFM interact with the atoms of the surface being analyzed, and a laser beam detects and records this cantilever's deflection. This information is then converted to a topographical image, which can then be used to determine the height and width of the cells under inspection. The skills required to perform this study include calibration of the ezAFM, operation of ezAFM software with test samples, software analysis, sample preparation, and quantification of bacterial samples.

INVESTIGATING THE EMISSION SPECTRA OF NARROW LINE SEYFERTS AND LOW-IONIZATION NUCLEAR EMISSION REGION GALAXIES THROUGH CLOUDY SIMULATIONS

Christopher R. Greene (Dr. Chris Richardson) Department of Physics

When the accretion disk of matter surrounding supermassive black holes in the center of certain galaxies produces more light than all the stars within the galaxy, the galaxy is labeled an active galactic nuclei (AGN) galaxy. This research examines the subsets of AGN known as Seyfert and Low-Ionization Nuclear Emitting Region (LINER) galaxies. A Seyfert galaxy has a nucleus that emits light comparable to the whole galaxy's constituent stars. Seyferts are the second largest class of AGN, allowing for the collection of large amounts of observational data. Groves et al. 2004 introduced the use of a power law to predict the intensities of light across the optical spectrum. While the model was more accurate than other current models, the single power law oversimplifies the more intricate processes occurring within the cloud. The core goal of this project was to test a similar model using the simulation code CLOUDY, which contains a double broken power-law model whose exponents, α_x , α_{ox} , and α_{uv} , determine the intensity of light across different wavelengths. Using observational data, Grupe et al. 2010 found a correlation between α_{uv} and α_x . By constraining α_{uv} as a function of α_x we developed a photoionization model for the ionizing spectrum of a typical Seyfert NLR. The incident SED is based on the spectral indices and the temperature of the accretion disk. The simulated cloud is constructed from physical variables including elemental abundances. To check the validity of our model, we

ran simulations across a range of free variables compared to data from the Sloan Digital Sky Survey. Our simulations accurately predicted the optical spectra of Seyferts; however, some of these spectra were closer to resembling those from LINERs. LINERs make up about 2/3 of the nearby galaxies, yet the exact physical mechanism causing light emission typical of LINERs remains a topic of debate. This suggests that we should examine the ability of our photoionization model to produce spectra that are typical of LINERs by adjusting the values of α_{ox} and elemental abundance scaling.

MICROSCOPIC FORCE PROBES FOR MEASURING MECHANICAL STRAINS IN PHAGOCYTOSIS

Duncan C. B. Hay (Dr. Benjamin Evans) Department of Physics

Phagocytosis is a biological process in which cell debris, pathogens, or other foreign objects are eliminated. Debris or undesired cells are engulfed by phagocytes and broken down by enzymes to be used within the cell or excreted as waste. The process of phagocytosis involves many forces which lead to deformation of the particulate being engulfed. In principle, measuring these forces in real-time could enhance our understanding of phagocytosis and related cellular processes. Therefore, the development of a fluorescent probe to study these systems would allow for extensive study of phagocytosis. In this work, we are developing a soft silicone microsphere which contains a distribution of fluorescent quantum dots (Qdots) to serve as a probe of cellular forces during phagocytosis. The microsphere is soft enough (5 kPa) to be deformed substantially by mechanical processes in the cell, and the deformation of the microsphere can be tracked by using confocal microscopy to monitor the displacement of the Qdots distributed throughout. To date, we have developed protocols to fabricate a stable colloidal suspension of silicone microspheres in an aqueous solution and have introduced fluorescent Qdots in appropriate concentrations to the precursor materials. Once the resulting microspheres are successfully crosslinked, they will be suitable for use in cellular studies.

A MAGNETIC CARRIER FOR TARGETED DELIVERY OF LIPOPHILIC PHARMACEUTICALS

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

In recent years, magnetic nanoparticles have shown promise in biological applications such as targeted drug delivery. The magnetization of the particles allows for directed delivery to tumors as well as the delivery of any pharmaceutical that may be adsorbed on the surface. Once at the tumor site, magnetic materials may be remotely heated with alternating magnetic fields. Heating may damage local tumor cells, along with inducing the release of the drug in dosages of high potency in the desired location. This mechanism is favorable to traditional chemotherapy because drug levels in unaffected areas of the body remain limited. In this study, a microsphere formulation was developed composed of magnetic nanoparticles in a silicone matrix. The silicone is able to absorb large quantities of lipophilic drugs such as those commonly used in chemotherapy. Lipophilic drugs are poorly soluble in water, but are readily taken up by the non-polar silicone matrix. Once the drug is encapsulated, the spheres can be remotely stimulated to release the drug using magnetic fields. The spheres created in this study were in the target size

range to pass into the interstitial space of tumor cells, 20-300 nm, in order to take advantage of a passive tumor targeting mechanism known as enhanced perfusion and retention (EPR). In addition, the surface of the spheres were passivated with polyethylene glycol for compatibility with *in vivo* application. In future stages of the project, different techniques for loading the spheres with a model lipophilic drug will be tested, and the holding capacity and magnetically-stimulated release of the pharmaceuticals will be measured.

Political Science and Policy Studies

IS SOCIAL MEDIA CHANGING THE WAY WE UNDERSTAND JUDICIAL CAMPAIGNS? AN EXPLORATORY STUDY INTO MODERN JUDICIAL CANDIDATE METHODS

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

The fact that most state court judges are elected is a fascinating feature of our American judiciary. The institutional mechanics behind judicial elections are diverse across the states, and there exists an absence of scholarly discussion around the way judicial candidates run their campaigns. Noticeably absent is research on the use of social media in judicial campaigns. Since executive and legislative candidates have found success in using social media when running for office, judges have shown a quick adoption of similar tactics to connect with voters to gain more support and provide winning campaigns. Here, I study how judicial candidates in state supreme and intermediate appellate court elections have used social media, including Facebook, Twitter, and websites, in order to learn more about whether and how judges are using these platforms for their election efforts. Data is collected through the examining of 10 state judicial races in 2014 and 2016. This work builds from research showing that the citizens who vote in judicial elections don't simply use blind voting procedures (Volcansek 1981), instead requiring that judicial candidates need to provide context for informing voters about their candidacy in order to perform competitively. This research investigates whether state judicial candidates have adopted social media into their campaigns, and if so, how candidates may use social media in the most effective ways possible. Elections for state intermediate appellate and supreme court positions generally occur across larger gaps of time than elected positions in the other branches of government, hence judicial candidates understand the importance of running effective campaigns during their rare opportunities to do so. This goal, among others, motivates them to prioritize the most effective methods possible, and this may lead to the adoption of social media platforms to provide necessary information to citizens so they can make educated preferences at the voting booth. This research shed lights on an ignored aspect of judicial elections - the judicial campaign - and may provide important information about the differences in how campaigns are run across the branches.

SENIORITY AND PATTERNS OF LEGISLATIVE PRODUCTION

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Existing research shows a clear relationship between seniority and the ability to pass legislation in the United States Congress. Effective passage of legislation is an important and expected duty of members of Congress. While members of Congress certainly have responsibilities beyond passing legislation, the passage of legislation is a common measure of productivity while in office. Increasing seniority is traditionally thought to have a positive effect on legislative production. Generally, this effect is characterized as linear, for lack of a more complex understanding. It is expected that members will be more productive the longer they serve. However, this may not be the case. This research aims to explore the effect of seniority, in combination with other factors, on legislative production. Specifically, this study investigates whether or not productivity initially rises, but later in a career begins to diminish. This is explored through data from the House and Senate in the 111th to 113th Congresses, with members of Congress as the unit of analysis. Evidence has been uncovered to support this diminishing returns hypothesis for bills in the House classified as the most consequential. Seniority itself displayed less significance than anticipated. These findings hopefully will contribute meaningfully to the discussion about the utility that members of Congress provide to their constituents, especially in a system with a strongly ingrained incumbency advantage.

VIRTUAL INCIVILITY: THE DEMOCRATIC CONSEQUENCES OF “RUDE” POLITICIANS ON TWITTER

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For centuries in American history, politicians have been “rude” and argumentative with other politicians. Contemporary technology, in particular social media, has given politicians new methods to rapidly disseminate their disagreement with each other. Twitter is rife with examples of prominent political figures being uncivil to one another on a daily basis. As both social media use and incivility in political discourse have increased, so have concerns about their effects on democracy. Evident in the literature is a dispute over whether disagreement within social networks is positive or negative for democracy (Ceron & Memoli, 2015; Hwang et al., 2016; Vargo & Hopp, 2015) and whether “going negative” is a viable political strategy that will engage voters (Landtsheer, 1999; Brooks & Geer, 2007). Scholars also disagree on whether or not the electorate has become polarized as either a result, or because of this incivility (Nivola & Brady, 2008; Levendusky & Malhotra, 2016). This research attempts to advance our understanding of these fundamental questions by examining what happens when everyday citizens are exposed to uncivil messages posted by political leaders on Twitter. Does it lead them to be more or less politically engaged? Does it lead them to distrust government or become less satisfied with democracy as a whole? And does it lead them to engage in more uncivil discourse with other citizens? By developing a series of randomized experimental designs embedded within online surveys, this project will create a series of real and simulated Twitter exchanges between politicians. Subject will then answer a series of dependent variable questions related to political trust, political engagement and norms of discourse. Results will shed light on the democratic consequences of a new form of communication.

INDIA’S ENDANGERED PARSIS: POPULATION POLICY AND STATE SECULARISM IN COMPARATIVE PERSPECTIVE

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In 2013, the Indian government launched the *Jiyo Parsi* (Long Live Parsi) initiative that combined fertility treatment, counseling, and outreach campaigns to curb the population decline of the Parsis, an ethno-religious minority group of approximately 57,000. While most literature focuses on the reasons underlying this decline and possible solutions, my research examines how this minority's unique circumstances have influence government policy relating to their family practices. Specifically, it asks how this policy to increase Parsi birthrates developed and why the government chose to invest public resources in the population growth of one community. Drawing on interviews with program staff, doctors, researchers, and community members in Mumbai, my paper contrasts the goals of *Jiyo Parsi* with those of India's broader population policies that are generally aimed at reducing fertility. Further, it considers the implications this Parsi program has for the treatment of Muslims, another minority group. It examines how the program fits into the larger landscape of Indian political structures both historically and under the emergent Hindu nationalist government, revealing a systematic privileging of this tiny but elite minority group. The Parsis are not resented for their affluence, as they took profits from early shipping industry in Bombay and invested into local philanthropies. My research found that the Indian people fully support government efforts to help save the dying community, but Parsis themselves are polarized on the best policy approaches to increasing religious and ethnic numbers. The issue goes beyond that of medical intervention, and social change must occur within the community's youth before policies like *Jiyo Parsi* can have real impact. I argue that the community must come together as a whole to find solutions to their problems, and the issue of reversing population decline must be a collaborative effort throughout all sectors of the society. My findings contribute to the understanding of the place of gender and religion in Indian secularism as well as the highly politicized nature of family planning in Indian society.

MORE THAN MOTHERHOOD: A COMPARATIVE ANALYSIS OF FEMALE SUICIDE TERRORISM IN IRAQ AND CHECHNYA, 1990-2015.

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This paper uses a most similar case study methodology to understand which factors most contribute to differences in patterns of female suicide terrorism (FST) in Chechnya ("Chechen Rebels") and Iraq ("Al Qaeda in Iraq or AQI") from 1990 to 2015. These differences include the proportion of attacks on civilians compared to political targets, the weapon type used to complete the attack, and the aggregate number of attacks carried out by women. While gender norm expectations separate violence from womanhood, the increasing number of female suicide bombers in conflict regions points to an increasing need to understand these attacks. The body of literature on violent women in terror organizations has been steadily expanding, but these two organizations have yet to be directly compared. Accordingly, this study seeks to fill that void. To gather a complete understanding of the FST attacks and emerging patterns, this research used data from the Chicago Project on Suicide Terrorism and the Global Terrorism Database. Analysis of regional expectations of women, religious influences and ideology, violence against the community, organizational goals, and regional demographics was conducted using process-tracing. Initial research suggests that cultural traditions of violence, including a prominent revenge culture in both Iraq and Chechnya, may have an impact on the target types. It also

suggests that religious influences may similarly impact the frequency of attacks in each region, as well as the ways in which the attacks are carried out. Moreover, preliminary findings indicate that the organizational goals of AQI and the Chechen Rebels are a contributing factor in explaining the differences in target and weapon types for the FST attacks.

HASSAN AL-BANNA’S WAR OF POSITION: A GRAMSCIAN ANALYSIS OF THE ORIGINS OF THE MUSLIM BROTHERHOOD IN EGYPT

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Social, political, and cultural developments in the Middle East and North Africa during the twentieth century illustrate a strong interconnection between Western intrusion and Islamic activism. This paper examines the origins of the Muslim Brotherhood in Egypt and seeks to assess the role of Islamism as a counter-hegemonic ideology that sought to unify Egypt and much of the Arab world in the wake of the colonial era. It explores how the Brotherhood embraced Islamism in an effort to resist the British colonial narrative of domination, and examines the role of imperialism and the legacy of colonialism in shaping the identity of former “subjects” in the Middle East. While several studies have focused on examining the Brotherhood as a contemporary movement, this analysis focuses on the Brotherhood’s rise to prominence in its first twenty years of existence, allowing for an exploration of the emergence of the movement as a response to imperialism. The research focuses on the early years of the Brotherhood from 1928-49, and uses the framework of political philosopher Antonio Gramsci to interpret the relationship between the hegemonic ideology of the British and the counter-hegemonic ideology of Brotherhood founder Hassan al-Banna. By examining cultural production such as Banna’s original writings and newspaper articles during this period, this essay interprets the Brotherhood’s rise as an expression of Gramsci’s “war of position” strategy for political mobilization. While this framework provides a useful theoretical approach for analyzing the interactions between social movements and modern institutions, it also proves to be highly reductive in its analysis and limits our ability to fully understand religiously-inspired motivations that stand outside a secular framework for understanding the world.

THE INTERSECTION OF STRATEGIC INTERESTS AND MORALITY: POST-9/11 US FOREIGN POLICY AND THE USE OF TORTURE IN UZBEKISTAN

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After the September 11th attacks prompted the beginning of the US-initiated War on Terror, the US began to closely align itself with many states with poor human rights records in order to bolster their efforts overseas. Uzbekistan has a history of rampant state-sponsored human rights abuses, yet quickly became a key US ally due to its proximity to Afghanistan, regional prominence, and issues with domestic terrorism. Within the context of the global War on Terror, many states have undertaken a variety of counter-terror tactics, including the use of state-sponsored torture, in efforts to protect their citizens. Despite the fact that this is a violation of fundamental human rights, states have consistently validated the use of torture in pursuit of counter-terrorism goals, prioritizing the strategic importance of fighting terrorism over commitment to the protection of human rights. This paper discusses Uzbekistan’s use of torture

in terms of their relationship with the US, highlighting the importance of shifting international human rights norms within the context of the global War on Terror. In order to avoid losing the strategic benefits of the relationship with Uzbekistan, US policies of strategic patience have attempted to balance pressure for rights reform with the counter-terror partnership. I investigate the influence that post-9/11 US foreign policy has had on the use of torture in Uzbekistan by analyzing the strategic importance of the US-Uzbekistan relationship, patterns of US military aid, and the effects of the 2005 massacre at Andijan. I argue that American prioritization of strategic interests over human rights along with the lack of consistent repercussions for violations has helped to facilitate the continued use of torture in Uzbekistan.

NARRATIVE, MEMORY AND IDENTITY: STORYTELLING IN THE BOSNIAN DIASPORA IN ST. LOUIS, MISSOURI

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During the war in Bosnia-Herzegovina in the 1990s, nearly two million people were forcibly displaced creating numerous diaspora communities around the world, including many in the United States. Scholarship surrounding diasporas is extensive, with identity, collective and individual memory and social change all being central themes throughout, including the role of storytelling and narratives within different diasporas. As home to one of the largest communities of Bosnians outside of Bosnia, St. Louis, Missouri allows for a unique study of memory and narratives in a local context. Informed by semi-structured interviews and secondary source analysis, the project addresses the role of storytelling in the Bosnian community over time, which includes interpersonal sharing as well as public commemorations. Specifically, I investigate how, why, and with whom individuals chose to speak about Bosnia, their experiences as refugees and the war of the 1990s. Storytelling is influenced by factors such as generation, hometown in Bosnia, emigration period, audience, and setting. Many themes are revealed in the analysis such as contested victimhood within the diaspora, identity changes throughout generations, storytelling as witness bearing, and the role of the Bosnian language in diaspora relations and identity expression. One primary finding is that victimhood is contested within the diaspora, in that those who came as refugees early in the war are not always seen as true victims when compared to those who stayed for the entire war. This dynamic reflects how victimhood is an important part of Bosnian identity. Are the same stories being told today as they were 20 years ago? What do generational changes mean for diaspora's future? How has the St. Louis community interacted and changed with the diaspora?

Psychology

HOW TO FIND HELP: STUDENT PERCEPTIONS OF SEXUAL ASSAULT RESPONSES AMONG PEERS

Elizabeth M. Belanger, Kyle A. Lynch, & Maggie B. Hakas (Dr. CJ Fleming) Department of Psychology

The purpose of this study was to better understand the ways in which undergraduates recommend resources to survivors of sexual assault. Past research has shown that sexual assault on college campuses is a systematic problem and if there are resources, they are underutilized and sometimes unknown to students. The present study focused on examining undergraduate students' awareness of and recommendation of both on campus and off campus sexual assault resources to their peers. A survey was created for and taken by 122 undergraduate students who had been told about a sexual assault by a peer. The survey asked students to rate both their and the average Elon student's perceptions of rape myths, to rate both their and their peers' beliefs about the helpfulness of using possible sexual assault resources, to rate their awareness of what resources are available on campus (both formal and informal), and to endorse whether or not they recommended key resources to their peers on campus. We hypothesized that undergraduates would recommend resources they thought were helpful and would recommend more resources if they thought it was socially acceptable to seek help. As expected, the results showed that believing seeking help was socially acceptable was positively correlated with recommending resources ($r = .432, p < .001$). Lower belief that someone would be judged for seeking help was related to higher belief in the helpfulness of resources ($r = -.249, p = .037$). Also, the perception that Elon students do not believe in rape myths was related to higher levels of belief in the helpfulness of resources ($r = .223, p = .038$), specifically regarding lower belief that the victim asked for it ($r = .235, p = .029$) and lower belief that the victim lied about it ($r = .220, p = .039$). These results suggest that student's perceptions of what their friends think and what Elon student body thinks influences how they recommend resources to survivors. These results can be used on Elon University's campus to more effectively help survivors of sexual assaults on campus.

ALIBI BELIEVABILITY: THE IMPACT OF TIMING OF DISCLOSURE, STRENGTH OF EVIDENCE, AND SEVERITY OF CRIME

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An alibi is a claim you were elsewhere at the time that a crime took place (Olson & Wells, 2004). An alibi can be verified by physical evidence like a receipt or video footage (Burke & Marion, 2012). One factor that may affect alibi believability is the timing of the alibi's disclosure to the prosecution. In North Carolina, after a case is set for trial defendants are given 20 days to present an alibi to the prosecution (North Carolina General Assembly). It is a common tactic for the defense to reveal an alibi late in the investigation/trial, as it may be harder for the prosecution to refute the claims (Burke & Turtle, 2003). To date, no researchers have empirically examined the impact of the timing of alibi disclosure. Further, no researchers have manipulated the type of crime of which the defendant is accused. In this study online surveys were distributed via MTurk, where participants ($N = 409$) acted as mock jurors and evaluated a court case in which a victim was assaulted in his apartment. The investigation narrowed on another tenant whose car was in the lot at the time of the crime. In a $2 \times 2 \times 3$ between-subjects design, we manipulated the timing of the defendant's alibi disclosure (1 day/19 days), the severity of the crime (misdemeanor/felony assault), and the type of evidence offered in support of the alibi (strong/weak/no physical evidence). We then examined the impact of these variables on alibi believability ratings and views of the defendant (e.g., trustworthiness). We hypothesized that the most positive views would occur in the early disclosure, misdemeanor assault, and strong alibi evidence conditions. As hypothesized, ANOVAs revealed that the type of evidence affected alibi

believability ratings; Higher alibi believability ratings occurred when there was strong physical evidence. There was no impact of the type of assault on any of the dependent measures. However, timing of disclosure affected ratings of defendant trustworthiness, such that those who disclosed early were seen as more trustworthy than those who disclosed late.

SELF-GENERATION AND CORRECTIVE FEEDBACK IN MEMORY FOR CONTEXT

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Compared to passive reading, self-generation of information improves memory for that information. Even generation of incorrect information can improve memory if corrective feedback is given (Metcalf & Kornell, 2007). In contrast, generation can diminish memory for contextual details associated with items (Mulligan, 2004). Prior studies have only focused on memory for contextual details of correctly generated items, without feedback. Thus, it is currently unknown how memory for contextual details is affected when the information that is generated is *incorrect* and when corrective feedback is given for that incorrect generation. Thus, the present study addresses two important gaps in the scientific literature. Participants were given semantic categories (e.g., “article of clothing” and then either read an example of that category (e.g., “shirt”) that was presented on the computer screen or generated an example from that category. Half of their generated responses were randomly determined as correct and they were given confirmatory feedback (i.e., “Correct!”), followed by their typed-in response. The other half of their answers were treated as incorrect and they were given feedback (i.e., “Incorrect”) that was then followed by the “correct” answer. The “correct” answer was an alternate member of the category. In order to provide contextual detail, the participant’s original response or the alternate answer (depending on the condition) was randomly presented on the screen in blue or yellow font. The results of the study demonstrate that font color was remembered more accurately when associated with corrective versus confirmatory feedback. That is, participants were more likely to remember contextual details of the event when their generated answers were incorrect and they were given feedback on them than when their generated answers were correct. These findings can be applied to a classroom setting in which the professor asks a student to answer a question, the student gives the wrong answer, and the professor gives corrective feedback to the student. This experience, although uncomfortable for the student, may allow the student to incorporate contextual details of the topic or classroom environment which allows them to more easily retrieve the information when they are tested on it later.

COMPARING THE EXPERIENTIAL DIFFERENCES OF FIRST-GENERATION AND LOW-INCOME COLLEGE STUDENTS TO CONTINUING-GENERATION AND HIGH-INCOME COLLEGE STUDENTS

Jayna R. Concannon (Dr. Katie King) Department of Psychology

In their new, semi-autonomous lifestyle, the use of support systems on college campuses can help students to transition smoothly, believe in their ability to succeed, and achieve both socially and academically. For first-generation and continuing-generation students, available environmental supports predict college self-efficacy, college outcome, and academic satisfaction (Garriott, Hudyma, Keene, & Santiago, 2015). This study contrasts the college experiences and concerns of first-generation and high-financial-need students to continuing-generation and low-

financial-need students in three areas: familial relations, academic experience, and social experience. It was expected that students identifying as first-generation, as well as students of high-financial-need, would experience more challenges in those three areas than those students identifying as continuing-generation and low-financial-need. In the first phase of this study, several themes emerged when 11 Elon University students (8 females, 3 males) from a variety of backgrounds were interviewed and asked about their familial relations, academic experience, and social experience so far in college. In the second phase, an online survey was constructed based on a qualitative analysis of the interview data. The survey was then distributed to a random sample (87 female, 41 male) of undergraduates at the University of North Carolina Greensboro. Preliminary results suggest that, as expected, the experiences of students with lower levels of financial need differ from students with higher levels of financial need. With regard to familial relations, students of high-financial-need report that while they feel their relationship with their parents has matured, misunderstandings and financial stress often leads to conflict and disconnect. In contrast, students of low-financial-need most often only report that their relationship with their parents has matured since coming to college. Additionally, students of high-financial-need report using a wider variety of campus resources for academic support than those of low-financial-need. Furthermore, students of low-financial-need report that financial considerations rarely impact their social experiences. In contrast, initial results suggest that students with higher levels of financial need report that monetary considerations have a larger, negative impact on their social engagement. Further analyses are in progress to assess additional experiential differences in high-financial-need and low-financial-need students, as well as first-generation and continuing-generation students.

IDENTIFYING EFFECTIVE ROLE MODEL STRATEGIES FOR BLACK WOMEN IN STEM CAREERS

Bernadette C. Cooper & Rachel K. Cockrell (Dr. India Johnson) Department of Psychology

Women of color (WOC) are underrepresented in science, technology, engineering, and mathematics (STEM) fields. One strategy to increase the representation of WOC in STEM fields is through the use of successful role models. Past research has shown Black women experience greater trust and belonging with a STEM company when they are presented with a successful Black role model. Given the low numbers of Black men and women in STEM fields, identifying strategies to bolster the effectiveness of White role models is critical. The goal of the present research is to use effective White female role models to increase the trust and belonging of Black women in STEM fields through identity safe cues. Black women were recruited from Amazon's Mechanical Turk and viewed a fictitious science and technology company. Participants were randomly assigned to review a no profile control or one of four different scientist profiles: a Black woman, a White woman, a White woman who endorses multiculturalism, or a White woman who identifies as an ally. Afterwards, participants' level of trust and belonging at the company were assessed. Additionally, participants completed a measure of stigma consciousness assessing to what extent one anticipates experiencing discrimination as a result of their group membership. We found participants in both the Black female scientist and White woman ally conditions showed greater trust and belonging compared to the no profile condition. However, ratings of participants who read either the profile of the White female promoting multiculturalism profile or the control White female profile did not statistically differ from the no

profile condition. Consistent with previous research, we also found that stigma consciousness was an important moderator. The White woman ally condition only produced significant levels of trust and belonging for participants' low in stigma consciousness. Conversely, for participants high in stigma consciousness, the white woman ally condition was not effective; only the Black female condition resulted in higher levels of trust and comfort. Overall, this study highlights how role models serve as effective identity safe cues for Black women and has important implications for how to increase the representation of Black women in STEM careers.

PARENTS' BELIEFS ABOUT YOUNG CHILDREN'S OUTDOOR AND NATURE EXPERIENCES IN DANISH AND U.S. CONTEXTS

Caroline D. Dean (Dr. Maureen Vandermaas-Peeler) Department of Psychology

In recent years, safety concerns and culture-specific interpretations of risk have begun to influence how different societies define play (Staempfli, 2008). Nordic communities encourage unstructured outdoor play and children spend significant time in natural environments (Fjortoft, 2001). North American communities, however, support play that is less exploratory and risk avoidant (Brown et al, 2009; Stephenson, 2003). Adults play a critical role in determining how their children engage with outdoor play environments (Chawla, 2007; Wilson, 2012). Studies have examined the perceptions of outdoor/nature play among teachers and school-aged children; however, few studies have been conducted on parents' perceptions of outdoor/nature play. Two studies were conducted to address this gap. In the first study, 30 parents living in the southeastern United States responded to questions about the importance of nature play for children's development. In the second study, 18 parents living in Denmark were interviewed with a similar protocol, with added questions germane to their cultural context (e.g., pedagogies and practices of early childhood educational institutions in Denmark). On the likert-scale questions, parents in both contexts rated the importance of *indoor play* significantly lower than *outdoor play* or *spending time in nature* for children's development. Parents also rated both *independent exploration* and *adult guidance* of children's play as very important, often noting the need for a balanced approach. Parents in the Danish context observed that outdoor play and risk-taking are common features of early childhood educational institutions. U.S. parents did not emphasize risk-taking as an important feature of children's play. Parents from both samples noted having more outdoor/nature play experiences in their childhood; however, the Denmark sample encouraged nature experiences for their children, regardless of their personal connection to the natural world. Despite recognizing its importance, the U.S. parent sample was less inclined to implement outdoor/nature play into their children's lives. Cultural context played a significant role in responses from both samples. Implications of these findings for early childhood educational settings and families will be considered.

THE AGE-RELATED ASSOCIATIVE MEMORY DEFICIT CAN BE MODIFIED BY MANNER OF PRESENTATION: THE ROLE OF REDUCED COGNITIVE LOAD

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The loss of the ability to form and remember associations is one of the more severe and consequential memory impairments experienced by older adults (Naveh-Benjamin, 2000). This general associative deficit is displayed as older adults experience difficulty in forming links

between pieces of information (Li, Naveh-Benjamin, & Lindenberger, 2005). The formation of these links occurs in the medial temporal lobe (MTL), including the hippocampus. During aging the hippocampus atrophies, making the formation of associations increasingly difficult. Research in younger adults has suggested that different types of associations are mediated by differing neural mechanisms (Diana, Yonelinas, & Ranganath, 2012). Our line of research is the first in the neuroscience field to investigate how the manner of presentation of stimuli pairings at encoding contributes to associative memory in older adults. It is currently unknown how reducing encoding load in item-item vs. item-context tasks affects older adult memory performance. This experiment compared item-item and item-context memory in younger and older adults by presenting the same types of stimuli (faces and scenes) as either two items or an item and a context. This was accomplished by manipulating temporal variability (blocked vs. trial-by-trial change) and focality (side-by-side vs. superimposed). The study consisted of four study-test blocks compared to a prior version with only one large study block (80 stimuli) and one large retrieval block (96 stimuli). Participants viewed 20 stimuli during encoding and 24 stimuli during retrieval for each study-test block. Thus, the current version reduced participants' cognitive load. Results indicate that the associative deficit in aging is worse in older adults for item-context than for item-item associations. These findings contribute to scientific theories of associative memory and age-related cognitive decline, and to our understanding of the functional organization of the MTL in aging. This study is part of a broader attempt in our lab to understand age-related memory change. These results can help elucidate why associative memory degrades in older adults and how this deficit may be compensated for or reduced through different encoding techniques, which could lessen the effects of memory impairment in older adults.

PARENT GUIDANCE IN LEARNING MATH AND SCIENCE AT HOME

Hailey R. Fleishman (Dr. Maureen Vandermaas-Peeler) Department of Psychology

The present research examined parent guidance of preschoolers' math and science skills. Parent guidance provides children the opportunity to engage in activities that expand their comprehension, knowledge, and aptitude (Vygotsky, 1978). Inquiry-based activities that combine science and math allow children to comprehend the relationship between science and math reasoning processes, and facilitate motivation and achievement in these subjects in later years (Sackes, 2013). The present research is a case study of three families who performed engaging activities together in the home environment. Families were selected according to the type and amount of guidance provided in different activities. Approximately five hours of video- and audio-recorded data were collected per family, including a first interview consisting of a math pre-test and an animal matching game; audio-recordings of parent-child interactions in three types of activities (cooking, games, and nature/gardening) over one month; and a final interview including a seed-sorting activity, math games (iPad and physical games), and a math post-test. All recorded activities were coded and analyzed for parent guidance and types of mathematical and scientific reasoning employed in the various activities. The case studies traced the progression of three children's math and science skills throughout the study, concentrating on how parent guidance supported or failed to support children's reasoning. One parent utilized extensive inquiry processes including open-ended questioning; another parent was very instructive and focused primarily on content knowledge; a third family included an older sibling

in the audio-recorded activities, which influenced the learning environment for the preschooler. Results provide information related to influences of the types of guidance parents provide to preschoolers, and the nature of the activities, on children's emergent math and science knowledge and skills. The findings are significant for understanding how parents can support and create opportunities for children's learning of science and math through play and engaging activities.

THE EFFECTS OF RISKY PLAY IN NATURE ON PRESCHOOLERS' SOCIAL ENGAGEMENT

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Department of Psychology

Spending time in nature is crucial for children's development (Louv, 2008; Gill, 2004). However, in the United States and many other countries, children are spending less time outdoors and in unstructured play in nature, and the benefits of risky play are debated. This study examined three components of children's interaction with the outdoors: how affordances in the natural world facilitate risky play, how risky play influences social engagement with peers, and how individual differences such as age, gender, and disposition impact the types of social engagement that are observed within risky play environments. Using previously recorded data (McClain & Vandermaas-Peeler, 2015), we observed eleven three to five-year-old children from a Reggio Emilia-inspired preschool in North Carolina. The Reggio Emilia approach to learning includes play, inquiry, and nature as essential for education and development. Two locations that the children visit regularly were observed in this study: a creek located behind the preschool and the Eno River State Park. The creek is a semi-structured environment with some built and some natural components (e.g., a rope swing, bamboo) and the river is a natural, unstructured environment. Three days of video from both locations were coded for risky play events. Events were identified systematically by starting at the five-minute mark and then watching the video in 60 second increments looking for Sandseter's (2009) categories of risky play. Some of these categories included play with great heights (e.g., climbing rocks) and play with high speeds (e.g., running fast). Risk-taking and social behaviors were coded within risky play events. Analyses indicated high levels of social engagement during risky play in both environments. Case study analyses of three participants revealed individual differences in behavioral responses to risk. One participant demonstrated high levels of exhilaration, another showed mid-range levels of exhilaration, and the third showed higher levels of initial fear responses, mediated through self talk and peer support. These findings can inform adults' support of nature play and emphasize the need for varied risky play environments in children's lives.

BOOST YOUR BRAIN: tCDS AND BRAIN TRAINING LESSEN THE INTERPRETATION OF SOCIAL EVALUATIVE THREAT

Aislinn M. Gherman, Clare L. Shaffer, Kalen M. Koch, & Madeline L. Mahla (Dr. Rachel Force) Department of Psychology

While a relatively new field, transcranial direct current stimulation (tCDS) and brain training have been shown to impact individuals' interpretation of negative events, possibly including that

of social evaluative threat (SET). Brain training, cognitive training that utilizes mental exercises to strengthen core skills, has been looked at in the context of tCDS, but the impact of tCDS on social evaluative threat is understudied. The question of training oneself to overcome negative social forces (e.g., SET) and their impact on personal identity was central to designing this study. The study measured the effects of various training and treatment methods on the interpretation and response to social evaluative threat in the context of ostracism. A 2x2 between subjects design was used to evaluate the effectiveness of treatment: activity type was one variable, with tCDS being the other. Activity was further comprised of novel actions (fencing) and cycling and meditation, while tCDS was split into active and inactive groups. Utilizing personality and behavioral measures (gathered through pre- and post-test surveys) to study the influence of active and non-active tCDS treatment methods on individuals' interpretation of negative experiences, results from the study offer several important conclusions. Effects of training were measured through self-report data retrieved through survey at the pre and post-test. The findings of this study, while forthcoming, are important to the most immediate communities impacted: those suffering from mental health issues that influence their interpretation of negative events as well as larger communities who wish to change their general interpretation of events. Social evaluative threat and anxiety have widespread effects on the individuals life, requiring scientific exploration of possible non-invasive treatments.

HELP ME, HELP YOU: A STUDY OF UNDERGRADUATE HELP-SEEKING BEHAVIOR IN RESPONSE TO UNWANTED SEXUAL EXPERIENCES

Maggie B. Hakas, Kyle A. Lynch, & Elizabeth M. Belanger (Dr. CJ Fleming) Department of Psychology

The purpose of this study was to understand the process of help-seeking behaviors in undergraduate survivors of sexual assault. Prior research shows there is a lack of service use in this population, which is problematic, given the negative consequences of assault. An online survey was created for undergraduate assault survivors. The participants ($N=157$) were asked about use of both informal and formal services, awareness of resources, as well as individual histories and beliefs and perceived social reactions of friends. We hypothesized that depression, post-traumatic stress disorder (PTSD), rape myth belief, and high social stigma would be related to lower awareness and lower informal and formal service use. Both regression analysis and correlations were used to analyze the data. Results suggested that lower levels of depression in a survivor, rejecting rape myths, and belief they will be not judged for seeking help was related to increased awareness of both informal and formal resources ($r=-.247, p=.008$; $r=.306, p=.001$; $r=-.221, p=.014$). Higher PTSD and depression were related to increased formal and informal use ($r=.410, p<.001$; $r=.527, p<.001$). Perception that their friends would believe that seeking help was a good idea was also related to service use ($r=.336, p<.001$). The regression analysis generally supported the hypothesis that depression, PTSD, rape myth belief, social stigma, and belief that help is good belief significantly predicted overall use of resources. Depression was not found to be significant, likely due to PTSD accounting for the mental health variance in the data. These variables accounted for 44.6% of the variance in help seeking behavior, ($F=16.592, p<.001$). These results suggest that an important path to increasing resource use in college assault survivors may be through developing education and outreach strategies that target awareness, rape myths, and social stigma to make college campuses safer spaces. This research will identify

barriers to help seeking in this population, which allows for future developments in sexual assault prevention and response programs.

THE AGE-RELATED ASSOCIATIVE MEMORY DEFICIT CAN BE MODIFIED BY MANNER OF PRESENTATION: THE ROLE OF ENCODING-RETRIEVAL CONGRUENCY

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The loss of the ability to form and remember associations is one of the more severe and consequential memory impairments experienced by older adults (Naveh-Benjamin, 2000). This general associative deficit manifests in older adults as difficulty in forming links between pieces of information (Li, Naveh-Benjamin, & Lindenberger, 2005). The formation of these links depends on the medial temporal lobe (MTL), including the hippocampus. During aging the hippocampus atrophies, making formation of associations more difficult. Research in younger adults suggests that different types of associations are mediated by differing neural substrates (Diana, Yonelinas, & Ranganath, 2012). Our line of research is the first in the neuroscience field to investigate how the manner of presentation of stimuli pairings at encoding contributes to associative memory in older adults. In particular, it is currently unknown how congruency between encoding and retrieval presentation may affect older adult memory performance. Memory across item-item and item-context associations in younger and older adults was compared by presenting the same types of stimuli (faces, scenes) either side-by-side or superimposed. The study consisted of one encoding block of 80 face-scene pairs and one retrieval block of 80 face-scene pairs. The presentation at retrieval was either congruent or incongruent with the presentation at encoding, unlike a prior version in which the retrieval presentation was always the same. Results indicate that older adults perform worse than younger adults overall, and that there are contrasting results for young adults and older adults when stimulus presentation at retrieval is incongruent with its encoding presentation, despite prior findings that incongruence may contribute to distinctiveness and aid in memory discrimination. The results have implications for scientific theories of associative memory, age-related cognitive decline, and the functional organization of the MTL in aging. This study is part of a broader attempt in our lab to understand what factors cause changes in associative memory with age. The results could help develop memory support for older adults who have cognitive disorders, or help develop memory strategies older adults.

THE RELATIONSHIP BETWEEN EXERCISE, SLEEP, AND IMPULSIVITY

Kalen M. Koch, Madeline L. Mahla, Aislinn M. Gherman, Clare L. Shaffer, & Olivia M. Brand (Dr. Rachel Force) Department of Psychology

Impulsivity is negatively correlated with educational achievement (Spinella & Miley 2003). Healthy behaviors including moderate exercise and restful sleep may boost cognitive control and thus decrease impulsivity. Research showed that increases in exercise reduced impulsivity (Black et al. 2013) and increased mental well-being (Salmon 2001), while self-reported measurements of sleep were associated with cognitive control (O'Brien, 2005). The biological mechanisms of both exercise and sleep have been explored in relation to impulsivity. Research

supports that exercise demonstrates effects on cognition through a brain-derived neurotrophic factor involved in energy metabolism and plasticity (Gomez-Pinilla & Hillman 2014). Sleep, specifically rapid eye movement (REM), involves theta synchrony, increased acetylcholine, reduced monoamines, and increased transcription of plasticity genes (Poe et al. 2014). These mechanisms during REM enable cognitive control after sleep. To investigate the relationship between exercise, sleep, and impulsivity during times of stress and challenge, participants completed a computerized task designed to assess impulsivity and self-reported hours of sleep and minutes of exercise near the end of the semester and again two weeks later. The balloon analogue risk taking (BART) is a computerized task where participants chose to inflate a balloon in order to receive token rewards. Greater inflations result in a greater reward, but only if the balloon does not overinflate and pop before the reward is received. We are examining the mean adjusted number of balloon inflations for the trials where the balloon did not explode for impulsivity. This is operationally defined by the number of inflations when coins were collected (Xu et al. 2013). We are analyzing the behavioral data from participants who completed the BART task at both baseline and post-treatment with three weeks of self-administered attentional bias training in between sessions. We expect a negative correlation between impulsivity and exercise as well as sleep that may be affected by the time of the semester. The findings could guide our future study focusing on novel exercise as a form of treatment for impulsivity.

ATTENTION BIAS MODIFICATION TRAINING ON IMPULSIVITY AND ALCOHOL CONSUMPTION

Madeline L. Mahla, Kalen M. Koch, Clare L. Shaffer, Aislinn M. Gherman, & Olivia M. Brand (Dr. Rachel Force) Department of Psychology

Attentional bias for negative or threatening stimuli is associated with symptoms of social anxiety and depression but is modifiable with training (Bantin, Stevens, Gerlach, & Hermann, 2016; Beevers, Clasen, Enock, & Schnyer, 2015; Dennis & O'Toole, 2014). By undergoing training during a critical period of myelination, networks involved in decision making are still developing in early adults (Crews & Boettiger, 2009) and risky behaviors may be altered through modification training (Steinberg, n.d.). While past research has not supported a stable relationship between approach and inhibitory behaviors and resting asymmetry in frontal alpha activation, these patterns may be evident during an affective decision making task (Schneider et al, 2016). As college students often experience these symptoms and are also exposed to situations in which impulsivity and delayed discounting can predict greater substance use (Ashenhurst, Bujarski, Jentsch, & Ray, 2014; Kollins, 2003), we tested the effect of placebo controlled attention bias modification training (ABMT) on impulsivity, self-reported substance use, and frontal asymmetries of alpha activation while completing the impulsivity task. EEG activity was measured while participants completed the balloon analogue risk task (BART) before being randomly assigned to placebo or active attention bias modification training for two weeks. Alcohol consumption was measured with an anonymous self-administered survey, that asked for the average amount of alcohol consumed per week during the 3 weeks prior to the study and while they completed the study. Past research quantified impulsivity as the mean adjusted number of balloon inflations for the trials where the balloon did not explode (Lejuez et al, 2002) but we also included the number of balloon inflations for popped trials. We will explore the relationship between these values and asymmetry in frontal alpha activation during the task.

By comparing impulsivity via the BART and self-reported alcohol use before and after treatment we can assess the impact of active ABMT. We will also have a clearer understanding of how asymmetry in frontal alpha activation may be associated with impulsivity and impacted by training.

TRANSPHOBIA IN SEX-INTEGRATED VERSUS SEX-SEGREGATED SETTINGS

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Though acceptance of transgender individuals appears to have become more common, this increased tolerance is not found in all settings; legislation that targets transgender individuals seems to focus particularly on denying access to bathrooms, suggesting that although discrimination generally may be opposed, this acceptance tends to fall short in sex-segregated settings. This research tested the hypothesis that attitudes toward transgender people will be more negative in sex-segregated than sex-integrated settings and explored possible individual differences that could explain negative attitudes in each setting. Participants completed an online survey that included newly created scales that separately measured attitudes toward transgender people in sex-segregated and sex-integrated settings. The survey also included existing measures of transphobia, motivation to respond without prejudice, ambivalent sexism, and belief in a dangerous world. Analysis of participant attitudes toward transgender people in sex-integrated and sex-segregated settings indicate that the two scales were moderately positively correlated, and as predicted participants reported significantly more negative attitudes in sex-segregated settings. Additional analyses were conducted to attempt to explain this context effect. The difference in attitudes was partly explained by dangerous worldview beliefs, internal motivation to respond without prejudice, and hostile sexism. These findings support the hypothesis that people tend to display more negative attitudes towards transgender individuals in sex-segregated settings than in sex-integrated settings, and they begin to explore the nature of this distinction.

AN INTERVENTION MODEL: USING THE REAPPRAISAL COPING STRATEGY TO REDUCE FREQUENCY OF BOREDOM

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Boredom is a common emotion that many individuals experience frequently, especially in educational settings. There have been several coping strategies identified that individuals use to reduce boredom in educational settings; in particular, previous research has suggested the reappraisal coping strategy to be most effective. Individuals who use the reappraisal strategy to cope with boredom increase their awareness of the value and importance of the information being learned (Nett, Goetz, & Hall, 2011). The current study used the concept behind this strategy. Participants included Elon University college students enrolled in both sections of Dr. Alexa Darby's Spring 2016 Educational Psychology class. For the experimental group, information was provided about the importance and value of the lecture material being presented at the introduction of each class period, in hopes that participants would use this information to reappraise the lecture material and reduce frequency and intensity of boredom. The other class section was not provided this information and served as the control group. Data was collected

from all participants through the use of a self-report survey at the end of each lecture. While frequency of boredom, intensity of boredom, and interest were not significantly different between experimental and control, material value was significantly greater for the group exposed to the intervention with a p-value of .049.

LINGUISTIC FRAMING EFFECTS ON CHARITABLE DONATIONS

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Many internal and external factors motivate and inhibit charitable donations, likely including the language used in donation requests. That is, the linguistic framing (Tversky & Kahneman, 2004) of the request could significantly impact if, and how much, one will donate to a cause. Three mixed-design studies investigated the most effective combination of linguistic frames, including fund name, explanation level, and restriction type (certainty of intended use), in regards to likelihood and amount of donation. Study 1 (lab study) included 200 Elon University students, faculty, and staff responses to hypothetical requests in an online experiment to test varied fund names and explanation levels only. Study 2 (field study) applied this concept to actual donation behavior at a local nonprofit exotic animal conservancy, investigating restriction type along with fund name and explanation level. Study 3 (lab study) applied the experimental methodology of Study 1 (with 269 students, faculty, and staff) and the organizationally-derived language from Study 2 to further connect these results. Inferential statistical analyses for Study 1 revealed participants were more likely to donate, and to donate larger amounts, towards an Animal Care Fund versus General Operating Fund, but there was no explanation level effect, nor interaction between the two variables. Descriptive results of the small sample in Study 2 revealed that donors most frequently chose to support the Animal Care Fund, where a more detailed explanation level and restricted type of donation were favored. For the Veterinary Fund and General Operating Fund, less-detailed explanation levels were favored, and larger amounts were donated toward restricted requests. Inferential statistical analyses in Study 3 revealed overall preferences for the Veterinary Fund and restricted donations. Although there was no explanation level effect, significant two-way interactions occurred among all three independent variables, providing further insight as to what combination of frames maximize donations. Among many conclusions drawn from these data, these results suggest that fund name is a strong predictor of donations and that people may not need more detailed information in order to make a donation, as long as they know their money is guaranteed toward a cause.

THE CORRELATION BETWEEN ANOREXIA AND PERFECTIONISM IN COLLEGE AGE WOMEN

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Eating disorders are the single most deadly mental disease (Insel, 2012) and one in five college students display symptoms of an eating disorder (Eating Disorders Among College Students, Walden Center). In an attempt to better understand the mindset of someone with anorexia and develop targeted therapeutic interventions, we used a mixed method design that analyzed the connection between anorexia and various aspects of perfectionism (e.g. obsessive-compulsive behavior, rigid thinking, rituals, etc.) as this construct is believed to play a critical role in the

development of the disorder. Participants were college-aged women with either a history of disordered eating or a healthy history with food. They then ranked 80 statements on perfectionism and were asked to rank order them in accordance to how it applies to them. An example of a typical statement is, “I do not like to do things I am not good at; I fear failure,” Factor analysis will confirm our hypothesis that women with a history of anorexia tend to think more obsessively and rigidly than women with no history of restrictive eating.

RARELY SAY NEVER: COLLEGE STUDENTS’ PERCEPTIONS OF PERSUASIVE WRITING AND ESSENTIALIST LANGUAGE

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Persuasive writing development allows students to learn critical thinking skills, participate in discussions, and co-create knowledge. Previous research on persuasive writing has investigated factors in writing quality but has not considered students’ perceptions of writing and of the specific language used in persuasive writing—the focus of this research. In Phase 1 of Study 1, undergraduates (freshmen through seniors) listed characteristics of writing for 3 categories: characteristics that created, that damaged, or that they personally used to judge writing. They were asked to provide these characteristics regarding persuasiveness, credibility, and quality separately. Coding of responses revealed students reported style/mechanics-related characteristics as important to quality, source-related characteristics as vital to credibility, argument-related characteristics as necessary for persuasiveness, and audience-related characteristics as important for both quality and persuasiveness. In Phase 2 of Study 1, students listed rhetorical indicators of the characteristics from Phase 1 to better understand how students define and differentiate between writing characteristics. Study 2 investigated the potential disconnect between the understanding of writing demonstrated in Study 1 and students’ actual interactions with writing by testing their reactions to essentialist language. Essentialist language—including words like “always,” “every,” and “prove”—insists on one explanation, ruling out a range of valid possibilities. One-sided arguments are less persuasive, so such essentialism creates poor persuasive writing. In Study 2, participants read pairs of writing samples—one with essentialist language and one with more nuanced, non-essentialist language—and indicated which was better and why, and rated each sample’s persuasiveness. Results revealed there was no difference in how often students chose essentialist samples versus the non-essentialist samples as better, although different reasons were associated with essentialist and non-essentialist choices. Students who preferred non-essentialist writing rated it as more persuasive than essentialist writing, but students with essentialist or no preference rated the persuasiveness of essentialist and non-essentialist samples similarly. These results support the notion that many undergraduates fail to recognize essentialism’s impact on persuasive writing despite reporting an abstract awareness of the essentialism-persuasiveness relationship. These studies provide groundwork for considering how to teach students how to write persuasively while considering the impact of essentialist language.

FRONTAL CORTICAL ASYMMETRY: ELECTROPHYSIOLOGICAL MARKERS OF SOCIAL STRESS REGULATION

Clare L. Shaffer, Aislinn M. Gherman, Kalen M. Koch, Madeline L. Mahla, & Dominic E.

Willoughby (Dr. Rachel Force) Department of Psychology

The fear of negative evaluations by others is evolutionarily rooted and can be assessed cognitively by measuring the belief that peers or members of a social group are casting judgment on the individual during social interactions. The degree of perceived social evaluative threat is associated with symptoms of anxiety (Van der Molen et al., 2013) and an inability to regulate emotions (Cavanagh & Allen, 2008). Hemispheric differences in EEG activity measured at frontal sites may reflect the ability to mediate anxious and neutral reactions to stressful experiences (Coan & Allen, 2007). The study aimed to try to find a relationship between the ability to mediate these emotional responses before and after treatment with tDCS. Studies of Transcranial direct current stimulation (tDCS) have shown promise as a means of improving cognitive and therefore, emotional control (Hogeveen et al., 2016). Though the exact mechanisms of tDCS are still under investigation, decades of research suggests it is most effective in use-dependent learning. The current study measured hemispheric differences in EEG activity and evaluated the effectiveness of transcranial direct current stimulation (tDCS) coupled with novel physical exercise on social evaluative threat. After baseline testing, participants were randomized to novel partner-based exercise with or without active tDCS versus stationary cycling followed by guided meditation. Novel exercise was defined as progressive fencing lessons in which partners practiced advances and retreats together. This skill requires cognitive control and attention to both self and other, with three lessons building these skills over 3 weeks. Stationary cycling with meditation was used as a positive control as prior research by Alderman et. al suggests that they are well established in reducing stress and anxiety. EEG cortical asymmetry was measured at both baseline and post-treatment. Sensitivity to social evaluative threat was measured via a self-administered survey at both time points. Data collection is ongoing, but the findings may offer important implications for the use of tDCS and novel exercise in the place of a non-invasive treatment method for anxiety that is rooted in social evaluative threat.

INFLUENCES OF INQUIRY-BASED GUIDANCE INSTRUCTION ON PARENTAL SUPPORT OF CHILDREN'S MATHEMATICAL AND SCIENTIFIC REASONING AT HOME

Lauren E. Westerberg (Dr. Maureen Vandermaas-Peeler) Department of Psychology

This study examined the effects of parent guidance and type of activity on young children's mathematical and scientific reasoning. Previous research has shown that adult guidance in engaging activities at home affords children opportunities to stretch the parameters of their knowledge, understanding, and skills (Rogoff, 1990, 2003; Vygotsky, 1978). Thirty-two children aged four to five years and one or both of their parents participated in cooking activities, games, and nature activities at home, and audio-recorded approximately four activities over a one-month period. Half of the families received information on how to implement open-ended, inquiry-based guidance into the activities (inquiry group) and the other half did not (control). Guidance for mathematics and science reasoning skills was expected to vary across activities and between the inquiry and control groups. Scientific reasoning was coded into five categories: observing and questioning; predicting; evaluating; comparing; and concluding. Mathematics skills and reasoning were coded into eleven categories: number words; counting; addition and subtraction;

number recognition; shape identification; spatial orientation; number comparison; size estimation; fractions; measurement; and sequencing. Findings indicated that science reasoning skills tended to be relatively evenly distributed across activities with 37% in cooking activities, 33% in nature activities, and 30% in games. Total amount of parent guidance for science reasoning skills did not differ between the inquiry group (53%) and the control group parents (47%). Basic science reasoning processes, like observing and questioning, did not differ due to inquiry guidance instruction, with 47% found in the control group and 53% in the inquiry group. However, the higher-level science skills (predicting, 63%; evaluating, 66%; and concluding, 67%) were found to be significantly greater in the inquiry group. Total amount of parent guidance for mathematics did not differ between the inquiry group (52%) and the control group (48%). Significantly more parent guidance for mathematics skills occurred in the cooking activities (42%) and games (40%) compared to nature activities (18%). Further analyses will be presented, and implications of the findings for early childhood learning in home and school contexts will be considered.

Public Health Studies

INTERNATIONALLY ADOPTED CHILDREN WITH PHIV: CHALLENGES ASSOCIATED WITH ADOLESCENCE

Sarah X. Alger (Dr. Cynthia Fair) Department of Public Health Studies

In 2010, restrictions on the immigration of HIV-infected individuals to the U.S. were eased. As a result, an increasing number of U.S. families have pursued the adoption of children with perinatally acquired HIV (PHIV) born outside the United States. Little is known about the needs of this emerging population, their adoptive families, or the adoption agencies. Currently, many internationally adopted children with PHIV are under the age of 12. As adopted children with PHIV mature into adolescence, there may be additional needs and challenges associated with this emerging population (i.e. independence, HIV, and adoption). One key informant and nine mothers of internationally adopted children with PHIV were interviewed regarding their views on potential challenges as their child matured into adolescence. Additionally, blog sites and news articles about parents who adopted children with PHIV from international countries were investigated. Information from the sites and articles were analyzed to better understand the needs and challenges of the maturing cohort of internationally adopted children with PHIV. Interviews and blog sites were coded for emergent themes using standard qualitative methods. Findings from the interviews suggested that faith was a guiding factor influencing parents' adoption of a child with PHIV from another country. Parents expressed concerns about disclosure of HIV status to others, romantic relationships, medication adherence, social stigma, and understanding the child's heritage. However, more immediate adoption-related issues such as pre-adoption trauma, loss, and language barriers often took priority over HIV-related concerns. Findings from the blog sites and news articles indicate that, as a child matured, parents worried he/she would experience rejection upon disclosure of HIV status to peers and future sexual partners. Further analyses indicated that as children transitioned to adolescence, they needed to learn illness self-

management skills. Therefore, parents of internationally adopted children with PHIV could benefit from the support of healthcare providers, social workers, and other adoption professionals as they prepare their child for increased independence associated with adolescence.

THE ROLE OF PEERS IN THE PARTICIPATION OF OBESE ADOLESCENTS IN FAMILY-SYSTEMS TREATMENT

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Climbing pediatric and adolescent obesity rates have become a high-priority public health concern and are associated with increased morbidity and mortality. Due to pediatric obesity's multifactorial nature, a family-based treatment plan in conjunction with behavioral modifications is considered to be the most effective method in improving a child's long-term weight and health status. Approximately half of families in pediatric obesity programs drop out of treatment (Skelton & Beech, 2010). Treatment adherence models that focus on pediatric and adolescent chronic illness, such as the Rapoff Model can be applied to obesity. The Rapoff Model focuses on three factors hypothesized to influence adherence: patient/family factors, disease factors, and regimen factors (Rapoff, 1999). However, the Rapoff model fails to consider the influence of a child's peers on adherence. This project aims to explore the roles that peers play on obese adolescents' (12-18 years of age) perspective of weight, weight loss, and motivation for treatment. Fourteen adolescents (9 females, mean age 14 years) who are or were enrolled in a family-based obesity treatment program and their parents (14 females, mean age 40.5 years) have participated in face-to-face recorded interviews. Transcribed interviews were coded for emergent themes using traditional qualitative methods. Findings suggest that few adolescents discuss their involvement in the treatment program with peers. However, approximately 50% of adolescents expressed interest in having their friends participate in activities such as cooking classes and family fun night, an event designed to encourage non-competitive physical activity. Parents indicated peer involvement might improve their adolescent's motivation to participate in more program-related activities. Findings provide insight into how peer relationships influence adherence to treatment. Improved retention in treatment can ultimately reduce the rate of obesity, related morbidity and mortality, and associated healthcare expenses.

THE DECISION MAKING PROCESS OF WOMEN WHO PLAN WATERBIRTHS

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Previous research has shown that the immersion of the body in warm water during any stage of labor has been shown to provide specific benefits to women, including a reduction of pain related to labor, a shorter labor, as well as a higher satisfaction with the birthing experience. Little is known, however, about how women choose to have a waterbirth. This project aimed to understand women's decision-making process through semi-structured interviews and response analysis. This study included 23 women (mean age = 33.5 years, mean number of children = 2.5)

who planned a waterbirth with the providers of a prenatal care clinic in a mid-sized southeastern city in the United States. Questions explored how they came to the decision to pursue a waterbirth, sources of information used, support systems, and resistance. Interviews were recorded, transcribed, and coded for emergent themes using standard qualitative analytic approaches. Although all participants used the tub during labor, five did not give birth in the water. Qualitative analyses revealed that pain management and a desire for limited medical interventions were the primary reasons for choosing waterbirth. Women sought information about waterbirths from the internet and friends, and many had decided they wanted to consider waterbirth before discussing it with their nurse midwife. Eight out of twenty-three participants changed prenatal care practices in order to have access to waterbirth. Three-fourths experienced resistance toward their decision from others including family, friends, coworkers, and strangers. Twenty participants utilized doulas for emotional and instrumental support. The overwhelming majority were positive about their experience, even if they were unable to give birth in the water, and encouraged other women to consider waterbirth. Most indicated they wanted to have a waterbirth in the future. Women who wish to pursue waterbirths are active partners in gathering information and are strong advocates for waterbirth. It is important to note that women who do not know about the possibility of waterbirth prior to pregnancy may need additional information from providers about whether waterbirth is an appropriate option. This research has the potential to provide evidence-based information to prenatal care providers.

IMPROVING AID EFFECTIVENESS TO AFRICA: A CULTURALLY INFORMED, SKILLS-BASED NON-GOVERNMENTAL ORGANIZATION TO EMPOWER LOW-INCOME WOMEN IN ADDIS ABABA, ETHIOPIA

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Sub-Saharan African countries have the largest concentration of low-income and highly indebted countries in the world. Several African states have received over 1 trillion dollars in foreign aid over the past 60 years and went through structural adjustment programs, but their poverty has increased and per capita income in 2010 was lower than in 1960 (Moyo 2010). In the 1980s, non-governmental organizations (NGOs) emerged as an alternative form of development delivery mechanism. Unfortunately, by the 1990s, many NGOs were failing to alleviate poverty because they were modeled after those in wealthier countries, but without the volunteerism motive, necessary skills, or reflection of countries' cultures (Makoba 2011). Foreign aid has done little to change that situation and scholars such as Ayittey (2005) argued that aid has heightened the crisis in Africa by creating dependency and supporting corrupt leaders (Easterly 2007, Moyo 2010). Thus, to examine the causes of poverty, to assess current programs implemented, and to identify culturally appropriate entrepreneurial solutions, ethnographic fieldwork was employed (June to November 2015) and semi-structured in-depth interviews were conducted with government officials, staff at non-governmental organizations and nearly two-dozen destitute women (23-58 years old) in the Nifas Silk-Lafto sub-division of Addis Ababa, Ethiopia. Also in Spring 2017, micro-entrepreneurship, leadership, and skill development training is being provided to 4 African refugee and immigrant women in Greensboro, NC, in collaboration with

the North Carolina African Services Coalition micro-enterprise initiative for empowering poor women through micro-business creation and self-employment programs. The long term goal of the NGO creation in Addis Ababa is to develop a social enterprise models, driven by the motive of alleviating poverty by empowering other underprivileged women and their families to become economically self-sufficient and entrepreneurial role models through micro-business creation that is marketable and scalable for social change and development in their community (Moyo 2010; Prabhu 1999; Yunus 2010). Preliminary findings of this study support the importance of a direct culturally informed entrepreneurship training, marketable skill development training and social entrepreneurship leadership development for low-income women to empower them in their goals of becoming self-employed and economically self-sufficient.

MIGRANT HEALTH EXPERIENCE IN ALAMANCE COUNTY: PROVIDER AND PATIENT PERSPECTIVES ON INNOVATION IN COMMUNITY-BASED HEALTH CARE

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Background: As non-urban 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 one such community. As new immigrants and migrants increasingly move into this region, we examined the role of community-based, Federally-Qualified Health Centers and volunteer-run clinics in serving the needs of these increasingly vibrant and diverse communities. **Methods:** This qualitative research compares the perspectives of providers and their patients, primarily those that speak Spanish. We conducted 10 semi-structured interviews with community-based health-care providers, and parallel focus groups (of 8-12 patient participants each), in four health-care facilities in North Carolina's Piedmont region. NVivo 10 software was used for qualitative data analysis. **Results:** Although data collection is ongoing and will be completed by June 2017, we will have significant amounts of data and findings by SURF. Preliminary findings suggest that key themes emerging from this research include (1) the differences between institutionally-versus individually-driven innovation in health-care practice; (2) the reasons motivating patients to seek care at community-based clinics instead of emergency departments; (3) and the role of translation services and other specific adaptive practices in guiding patient decision-making. **Conclusion:** This research provides a unique opportunity to compare the perspectives of health-care providers and their patients in North Carolina's Piedmont. With an increasingly diverse population, health-care providers in a community with limited diversity must also adapt. Results from this research may help to inform future health-care practices in this region, and also provide insights to other communities across the United States experiencing similar demographic change.

BLACK WOMEN CHOOSING OUT-OF-HOSPITAL DELIVERY

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In recent years, natural and alternative births have become more popular in the United States. There are large birthing movements to increase the use of doulas and midwives as part of the normal standard of childbirth in America. Currently, hospitals are the most frequent setting for births and cesarean sections are the most frequent medical procedures (Boucher, Bennet, McFarlin, & Freeze, 2009). African American women are more likely to receive more medical intervention during childbirth than other women. Data from 2012 show that 1.36% of women choose out-of-hospital birth for their deliveries. Disparities exist in out-of-hospital births where 2.05% are to non-Hispanic white women and only 0.49% are to non-Hispanic black women (CDC, 2012). While there has been some research exploring this topic, black women are rarely a part of home birth studies even though they are less satisfied with doctors and hospital staff during labor and delivery (Farrish & Robertson, 2014). Women who choose out-of-hospital birth have high rates of satisfaction during birth (Boucher et. al, 2009). Understanding the reasons why African American women choose alternative birthing methods as well as the factors that increase the likelihood of carrying out their wish is important to decrease disparity gaps. To date, an extensive literature review and informational interviews have been conducted with African American doulas, childbirth educators, and Lamaze coaches to assist with guiding the research. Initial comparisons of the research literature and the interviews based off of direct practice indicate a need to both understand the factors that lead African American women to choose and to complete an alternative birth, as well as understand cultural barriers. The next stage of research will involve using qualitative research methodology to collect data from at least five African American women via individual interviews and focus groups. The data will then be analyzed using a Sort and Sift, Think and Shift method (Maietta, 2016). Initial themes will be identified, reported back to participants, and shared in professional settings.

CAPTURING THE API STUDENT EXPERIENCE – A PHOTOVOICE PROJECT AT ELON UNIVERSITY

Ozelle J. Bower (Mr. Reikan “Ray” Lin) The Center for Race, Ethnicity and Diversity Education

The Asian/Pacific Islander (API) experience is one that is not easily visible at Elon University. The goal of this research project is to uncover what challenges API students go through and how we can improve their experiences at Elon. By using a community-based participatory research (CPBR) approach, we are able to uncover the different perspectives of API students who represent just 2.5% of total student body. A team from the Center for Race, Ethnicity and Diversity Education (CREDE) used the Photovoice method to generate qualitative data about the API student experience. We first recruited seven API identified Elon students with multiple ethnicities, nationalities, classes, and genders. During our orientation session, in a group discussion setting, we generated a research question in which the participants were to go out and take pictures that answer the question. Then, the participants came back as a group and by using the photo as a starting point for an in-depth conversation, we were able to generate qualitative data over the course of four sessions. We will use Dedoose to code and analyze major themes using the transcripts from each session. Our preliminary findings are revealed common themes of

belonging and acceptance, negotiating fitting in versus being authentic, and consciousness of being racialized. A lack of support for API students at Elon University is another important research finding, so there is a need for more support, conversations, and resources tailored to the API population.

“I’VE BEEN FEARFUL OF THE LABOR PART”: THE INFLUENCE OF PREVIOUSLY HEARD BIRTH STORIES ON THE BIRTH EXPERIENCES OF PRIMIPAROUS AFRICAN-AMERICAN WOMEN

Michelle H. Reissig (Dr. Cynthia Fair) Department of Public Health Studies

Racial disparities in birth outcomes have been well-documented. In comparison to other women, African-American women experience higher rates of maternal and infant mortality, preterm and low birthweight births, and primary c-section without clinical necessity. Yet little research has explored how these disparities are experienced and the ways those experiences are shared between women through birth stories. The birth stories of other women are an especially important source of information for primiparous (pregnant for the first time) women who have not previously experienced childbirth. This qualitative study sought to examine the birth experiences of African-American women in the context of the birth stories that they had previously heard. Eleven primiparous African-American women (age 21-41) recruited from an OB/GYN practice in North Carolina completed prenatal and postpartum in-depth semi-structured interviews. During pregnancy, women were asked to recall birth stories shared with them. Six weeks post-partum, women shared their own birth story and reflected back on stories they had previously heard. Interviews were transcribed and coded using traditional qualitative methods. Results showed that the participants’ birth experiences were characterized by a high number of medical interventions, including nine deliveries by c-section. Descriptions of interventions and c-sections related back to previously heard birth stories that shaped expectations for or attitudes towards the interventions or c-section. Women often framed nurses, midwives, and/or obstetricians as the active agent when making decisions about interventions and reported positive experiences with these providers. The decision to proceed with a c-section was a notable exception, as several women situated themselves as a primary actor in this decision. In conclusion, these findings suggest that women drew upon previously heard birth stories and information from providers to make informed decisions when they believed they had the opportunity. Yet despite reporting positive relationships with providers, participants described few instances of personal agency related to medical interventions. These findings suggest that providers should build upon positive relationships with their patients and look for opportunities to promote personal agency in the medical decision-making process.

FOOD MANAGEMENT PRACTICES AND HOUSEHOLD FOOD DECISIONS AMONGST INDIVIDUALS RECEIVING FEDERAL NUTRITION ASSISTANCE

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Food insecurity, experienced by individuals, households, and groups at large, is defined as the insufficient access to safe and nutritious food to maintain a healthy and active lifestyle. Federally

regulated nutrition assistance programs, such as the Supplemental Nutrition Assistance Program (SNAP) and the Women, Infants, and Children (WIC) Program, strive to reduce food insecurity among low-income individuals. While quantitative data are often used to evaluate these programs' effectiveness, little qualitative material (i.e. personal stories and opinions) exist. As a way to better understand food insecurity and the food management practices of SNAP and/or WIC recipients, ten semi-structured interviews, ranging from thirty minutes to one hour, were conducted in the Burlington and Greensboro, NC areas with different recipient households. Questions addressed food management techniques and practices, strategies employed to maximize benefit funds, and overall program satisfaction and suggestions. Interviews were audio recorded, transcribed, and analyzed using Dedoose software for recurrent themes. A majority of participants reported cyclical monthly shopping patterns, buying food in bulk, having inadequate funds to supply food in the home, and relying upon a child's daycare or school to provide breakfast and lunch. Additionally, many desire SNAP or WIC sponsored nutrition classes, mentioned their intent to shop at a local farmer's market, and expressed appreciation for the program at large. These findings can be used to strengthen federal nutrition assistance programs and activate local change through the continued promotion of farmer's markets and implementation of community budgeting, nutrition, and cooking classes. Future studies should look to see if study trends vary geographically or if food management practices and policy suggestions are similar throughout the country.

ASSESSING PREGNANCY PREVENTION AND VOCATIONAL NEEDS OF SOUTH AFRICAN ADOLESCENTS AND YOUNG ADULTS: A COMMUNITY-BASED PARTICIPATORY APPROACH

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This project describes a needs assessment designed to support a skills program in KwaNdengezi, South Africa, a community with limited resources. Despite the end of apartheid in 1994, the consequences of oppression linger, especially amongst less-privileged adolescents and young adults (AYA) without access to high quality education. In 2010, 72% of the unemployed population was AYA (Mayer, 2011), and one in five 18-year-old women had a child (Grant & Hallman, 2008). Primary research questions examined: 1) AYA pregnancy prevention and vocational needs; and 2) necessary community conditions for sustainability of a skills program. A community-based participatory research approach was used to involve community members in defining the problem and promote ownership of the findings. Through purposive snowball sampling, five community leaders were selected as part of an advisory committee, which identified community needs and the AYA participants. Twenty-one AYA (13-21 years) including high school and university students, and unemployed individuals, participated in three focus groups, which were audio-recorded and conducted in English/IsiZulu, based on participants' preferences. Eight individuals completed surveys. Questions centered on resources to prevent teenage pregnancy and to reduce unemployment. Transcribed data were subsequently coded for emergent themes using Dedoose. Findings indicated younger participants felt prepared for a life after high school, but could not identify resources. Older AYA believed parents and schools did not offer substantial career guidance. Participants felt teenage pregnancy was due to social pressure. A participant mentioned, "everyone has to make an impression and feel accepted and be somebody." Lack of communication was also expressed as a contributing factor. One

participant indicated, “parents are only eager to have a conversation about sex once a problem has occurred.” In addition, youth unemployment was due to few entry-level jobs, lack of professional networking, and poor computer and communication skills. One participant stated, “I graduated in 2012, but till this day I still don’t have a job.” Conditions necessary for the success of the program included informing parents/community, inclusion of males and females, and accessibility. A skills program is recommended to bridge the gap between aspiration and reality. Recommendations include mentorship programs, educational programs, and guidance counseling.

INFLUENCE OF PARENTAL FOOD PREFERENCES ON CHILD FEEDING PRACTICES IN HOUSEHOLDS RECEIVING FEDERAL NUTRITION ASSISTANCE

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Household food insecurity is identified as nationwide public health issue in which households do not have access to enough nutritious foods (ADA, 2010). When quantities are limited, parents may resort to creative food management methods to ensure that their children do not become undernourished. Furthermore, previously formed food preferences of the parent and nutrition assistance programs simultaneously impact feeding practices. This study explores food-related memories, preferences, and behaviors of parents in households receiving federal nutrition assistance. Supplemental Nutrition Assistance Program (SNAP) and Women, Infants, and Children (WIC) have been proven effective largely through quantitative studies. However, the use of qualitative methods is necessitated because quantitative measures of participation do not entirely indicate that all household members are receiving adequate, nutritional intake. This study will expand policymakers’ awareness of motivations behind parental feeding behavior in households on public assistance and ideas on how to improve procedures aimed at alleviating food insecurity. A purposive sample of ten head of households from Burlington, NC and Greensboro, NC participated in face-to-face, semi-structured interviews lasting from thirty minutes to an hour. Participants were asked about childhood food memories, grocery shopping, current practices, and ability to provide food for their household. Interviews were audio recorded, transcribed, and qualitatively coded and analyzed using Dedoose software. Thematic analysis of responses revealed narratives and memories that prompted more insight into participants’ life experiences, the idea that parents maintain childhood food-related traditions and ideals in their current household, how parents make ends meet to satisfy their children’s needs, conscientious grocery shopping, and the immense impact of SNAP and WIC. Overall, the study’s findings suggest that food behaviors during childhood translate to food management, practices, and coping mechanisms employed by parents in their households. Understanding the successes and inadequacies of SNAP and WIC based on cultural and familial background can benefit educators and outreach community members. Future studies on food insecurity should seek to expand upon ethnographic methods through use of grocery shopping and meal preparation observation, gain more narratives from parents and children who use SNAP and WIC, and continuously analyze the benefits and complications of nutrition assistance programs.

AN ANALYSIS OF MENTAL HEALTH HELP-SEEKING BEHAVIORS AND PERCEPTIONS OF STUDENTS IN TRANSITION FROM HIGH SCHOOL TO COLLEGE

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Adolescent mental health, while a widely researched topic, lacks information regarding the transition between high school and college and its impact on help seeking. Help seeking may be defined as seeking out help from professionals, family, peers, clergy, the Internet, and other significant relationships. Mental health is defined by the World Health Organization as a state of well-being, in which an individual realizes his or her own abilities, can work productively and make a contribution to his or her own community, and can cope with the normal stresses of life. Mental health and well-being, along with physical and social well-being, combine into one's overall state of health. 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 the proposed 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 provide the field with more ideas on how to better reach vulnerable groups. In order to address the major questions in this research, the researchers will be creating surveys to be distributed to first-year Elon students through COR 110 courses that will assess help seeking behaviors and perceptions of institutional efforts. Follow up interviews will then be conducted in order to obtain more in-depth knowledge regarding behaviors and perceptions. Lastly, high school guidance counselors will be interviewed by phone in order to ascertain current practices that promote help seeking.

Religious Studies

THE SOUTH INDIAN “WIFE OF GOD” AFTER CRIMINALIZATION: PATRIARCHY, LIBERALISM, AND DEVADASIS

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Devadasis (often translated as “servants of god”) are female performers, courtesans, and ritualists married to a deity in South India who have been criminalized by the Indian government at the state level. Although *devadasi* dedication to a deity is now illegal in all areas where it has been traditionally practiced, thousands of *devadasis* continue to operate today in rural northern Karnataka where they are known as *jogammas* and are dedicated to a regional goddess called Yellamma. While “*devadasi*” is an umbrella term for many types of female ritualists and performers throughout South India, “*jogamma*” is a regionally specific term and refers to a group of women who stand in stark contrast to the oft-celebrated glamorous, classical *devadasi* and are, instead, generally quite poor and low-caste and are now nearly unequivocally labeled prostitutes. In this region of Karnataka, local culture largely valorizes *jogamma* dedication and practice, despite accusations from the urban and educated elite that this supposedly once great and pure tradition has degenerated into a method of sexual exploitation of poor and low-caste women. My

research project relies on textual and narrative analyses of anthropological and public health literature as well as my personal ethnographic fieldwork in the Indian states of Karnataka and Goa during the summer of 2016 and January 2017 in which I interviewed lay, non-*jogamma* devotees of the goddess Yellamma. In this paper I argue that the narrative history of the ancient *devadasi* tradition is one that has been largely fabricated and that has, as a result, stigmatized and delegitimized the lives of contemporary *devadasis*. Furthermore, I maintain that the *devadasi*-as-prostitute paradigm—one firmly entrenched in current Indian law—is both inaccurate and deeply harmful. The *jogammas* of Karnataka are understood locally as *pujaris*, or ritual specialists, whose divine marriage and ritual expertise is vital to proper Yellamma worship, not the exploited prostitutes of a degenerate tradition as many sources claim them to be.

“TIME IS THE SCROLL”: POETIC EXPRESSIONS OF MUSLIM AND JEWISH IDENTITY IN AL-ANDALUS

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The expansion of the Umayyad Empire to the Iberian Peninsula, or Al-Andalus, in the early eighth century inaugurated a unique instance of Arab Muslim rule in the European world. Although scholars often remember Muslim ruled Al-Andalus fondly, the area fell victim to an incredible amount of political turmoil as various Islamic in-groups fought for power, leading to waves of dislocation and unrest. This paper draws upon the connection between literature and history in attempts to express a larger sociocultural phenomenon through the writings of individual poets. I compare the poetry of Muslim scholar Ibn Hazm with that of the Jewish poet Moses Ibn Ezra to examine the ways in which each figure draws upon a form of Pre-Islamic nomadic ode, known as the *qasida*. I discuss the original form of the *qasida*, including the loss of the beloved, the journey of the poet, and the boast, and then I show how Ibn Hazm drew upon the original themes of the *qasida* to reflect on his personal identity as caught between the quixotic tendencies of his past and his preference for righteously guided reason. I then discuss how Ibn Ezra adopts the structure and language of the *qasida* in order to convey an expression of Jewish communal identity that is transcendent of the binds of time.

A THIRD GENDER: INVESTIGATING AUTHORITY, LEGITIMACY, AND MODERNITY IN INDIA’S *HIJRA* COMMUNITY

Justin K. Brown (Dr. Amy Allocco) Department of Religious Studies

This paper argues that the societal authority that many *hijras*, a third gender community in India, gain by virtue of religious and ritual performances, such as dancing at weddings and births, alms-begging, and embodying popular religious myths, is ultimately powerful only within a limited sphere of influence in the Indian context. Although *hijras* gain limited social acceptance, capital, and authority through these practices, they also face issues including harassment and rape by police, increased rates of HIV/AIDS, and the erasure of their identities by NGOs and other advocacy organizations in the wake of the global HIV/AIDS epidemic. Drawing on ethnographic studies of *hijra* lives, autobiographies, and gender studies literature, this paper argues that analyzing *hijras*’ status in relation to the religious roles they play and the ritual authority they claim is insufficient to dictate the state of the *hijra* community. Specifically, examining *hijras*

through an exclusively religious lens fails to acknowledge the community's multifaceted set of identities in relation to India overall. Instead, a closer examination of other societal factors, such as political representation, the influence of classical Hindu texts, and economic considerations is required in order to gain a fuller picture of the place of *hijras* in Indian society.

CONSTRUCTING AND PERFORMING AUTHORITY IN YOGA TRADITIONS: AN ETHNOGRAPHIC APPROACH

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Yoga is a layered set of traditions with a colorful past rooted in India's ancient history (c. 2500 BCE). With yoga's astounding recent popularity in the United States, scholars and practitioners have engaged in debates about what constitutes "authentic" yoga and who "owns" it. Particularly as India itself seeks to "reclaim" yoga from globalized world culture, contemporary yoga teachers worldwide must continually negotiate their roles as sources of authority vis-à-vis yoga traditions. Drawing on ethnographic research conducted in India and the United States, this paper analyzes how teachers and gurus have established and maintained such authority in each context to better understand the complex interplay of text, ritual, bodily practices, philosophical teachings, and nationality at work in contemporary yoga. More specifically, it focuses on the gendered dimensions of contemporary yoga and examines what roles have been made available to women over time, particularly as these traditions have expanded transnationally. As a part of a larger research project, my paper combines perspectives culled from interviews and participant-observer fieldwork in India and the United States with discussions from the academic literature on yoga in order to examine how gender discourses appear in these diverse yoga contexts. I argue that while women have not traditionally held prominent positions of religious authority in Indian traditions, the more malleable elements of yoga traditions have offered women unique and expanding opportunities for authority within transnational contexts.

DISSOLUTION, DISMEMBERMENT, AND THE QUEER DIONYSIAN: ON LITERARY REPRESENTATIONS OF DIONYSUS AND THE BACCHIC RITES

Zachary J. Gianelle (Dr. Lynn Huber) Department of Religious Studies

Studies of the ancient Bacchic rites associated with the god Dionysus give much attention to their relationship with Greek theatre and Roman law and politics (Walsh 190-2; Easterling 36-7). Given these rites' association with sexual licentious and gender deviation, it is surprising that there is little scholarship on the queer nature of the Bacchic rites. This paper addresses this lack by exploring the ways in which Dionysus and the Bacchic rites, particularly as described in the *Bacchae* of Euripides (5th Century BCE Athens) and in the *Histories* of Livy (1st Century BCE Rome), define a space of queerness and *jouissance* in the ancient world. Working closely with these ancient primary sources, and bringing to bear the queer theoretical approaches of Lee Edelman and Tim Dean, I highlight the ways these accounts associate Dionysus with the dissolving of Greek and Roman cultural norms with regard both to sexuality and to the body. Specifically, in Euripides' account, I examine the descriptions of Dionysus as destructive of the social and political structure of Thebes, of the Bacchae's active rejection of their gendered office as mothers, and of Dionysus as a sexualized character in the drama, particularly to the eye of Pentheus, the king of Thebes. These qualities of Dionysus and his rites allow them to figure

outside of the hegemonic, heteronormative political and social structure, as Edelman would argue. As for Livy's account, the Bacchanalia features elements of the pollution of sexual immorality and of violence against the bodies of young male citizens. The Dionysian rites, then, constitute a sexual threat analogous with the threat of homosexuality, especially in the midst of the AIDS crisis in the 80's. The ways in which these descriptions of queer sexuality figure as a disease reflects a space of queerness that Tim Dean defines in his work on barebacking subcultures within gay communities. Dionysus embodies many of the qualities of queerness outlined by Dean and Edelman, and by exploring these we can better understand ancient expressions of sexuality.

INTERSECTIONS: WOMEN'S RESISTANCE IN LAW, RELIGION AND ACTIVISM IN CONTEMPORARY SOUTH INDIA

Audrey A. Griffith (Dr. Amy Allocco) Department of Religious Studies

This research project presentation brings secondary readings into conversation with my own ethnographic research in India to investigate what women claim are the central issues they face and how they navigate within legal, religious and activist frameworks to negotiate these issues. Drawing on feminist theorists such as Lila Abu-Lughod, Judith Okely and Nancy Hartsock, this research is informed by standpoint feminism and transnational feminism. After three weeks of intensive field work and more than forty interviews, my ongoing research brings disparate voices contributing to women's resistance today into conversation with one another and the insights of feminist analysis. During January 2017, I learned with women such as a senior advocate in the High Court of Madras, feminist activists and NGO coordinators, and ordinary religious women in temples and their homes, testing the frameworks of various scholars within diverse experiences. In the current moment, Indian women work individually and collectively in various ways to push against the challenges they face. Ultimately I argue that transnational feminism should inform contemporary feminism in the current political moment because there are similarities in the oppression facing women in India and the United States. Patriarchy works across borders, so transnational feminism must push back utilizing collective power within and across borders.

INDIA'S ENDANGERED PARSIS: POPULATION POLICY AND STATE SECULARISM IN COMPARATIVE PERSPECTIVE

Emily K. McHugh (Dr. Amy Allocco) Department of Political Science and Policy Studies

See abstract in Political Science and Policy Studies section

THE ANIMÉ AND MANGA APOCALYPSE: END OF THE WORLD NARRATIVES IN JAPANESE POPULAR MEDIA

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Cultures influenced by Jewish and Christian textual-visual traditions often feature stories about the end times or last judgement. Understandably, Japan has no history of such apocalyptic or eschatological motifs (Napier, 2001, p. 196), something that would strike a newcomer to Manga

(Japanese black-and-white comic books) and Animé (often-highly-stylized Japanese animation) as perplexing, because they are littered with such narratives. This research paper explores this recent phenomenon in Japanese popular media, and how apocalyptic and eschatological themes serve as evidence of a cultural interaction between Japan and the West (Bouissou, 2010, p. 21). Employing definitions of apocalypticism and eschatology used by scholars of religious studies, this research provides a content analysis of three works, each one a reimagining of apocalyptic narratives: Kenta Miura envisions an anti-Christ figure in his manga *Berserk*, Keiko Nobumoto's animé *Wolf's Rain* seeks paradise in a post-eschatological setting even as she critiques the genre of apocalyptic stories, and Hideaki Anno's animé, *Neon Genesis Evangelion*, explicitly engages the themes and imagery of apocalyptic, eschatological, and post-eschatological traditions. This paper attends to the ways these themes influenced the media, and how they were brought to the foreground in Japan in the wake of the Aum Shinrikyo terrorist attacks of the 1980s. Moreover, researching how these Japanese media employ apocalyptic tropes in Manga and Animé sheds light on the ways that some within Japan reimagine the Western cultural motifs in a new idiom, and it widens our understanding of the influence of apocalyptic and eschatological tropes in relation to popular culture

EXAMINING THE ROLE OF RELIGION IN SHAPING SEXUAL ATTITUDES AND BEHAVIORS AMONG U.S. LATINAS

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In recent decades, some strands of Protestant theology have moved from defining sexual morality as confined to marriage toward a more justice-oriented approach that shifts the moral evaluation from the structure of marriage to the quality and health of relationships. This new model acknowledges that human sexuality is culturally encoded and reflective of societal values; this idea is apparent within Latinx constructions of sexuality in which different elements of ethnic and cultural heritage and theology are visible and reflected. Drawing on qualitative research through semi-structured interviews and participant observation, this project examines the sexual attitudes and behaviors of a group of Latina women in a North Carolina Protestant congregation. In centering this research around two distinct groups of women (first- and second-generation migrants), this project clarifies the roles that migrant status, culture, and religion play in attitudes and behavior regarding sexuality. This study draws on Christian sexual ethics and data on sexual attitudes and practices of Latinx communities to explore the role and authority of religion and religious beliefs in helping to shape attitudes around sexuality, contraception, family, and marriage; if and how this changes over time as migrants live in the U.S.; and whether these attitudes are affected by other factors that mediate religion and culture in the Latinx migrant experience. Through the lens of five key determinants of sexual behavior - family, peers, partners, socioeconomic status, and level of acculturation - I discuss the ways in which women's religious convictions are inextricably tied to their cultural/ethnic identity and background. I argue, using an intersectional feminist analysis, that religion cannot be easily or neatly distinguished from other factors, such as ethnicity or family. In fact, my research reveals that religion plays the largest role in women's sexual decision-making, influencing all other factors, including family, partners, Latinx cultural norms, and education.

Sociology and Anthropology

NAVIGATING GLOBALIZATION THROUGH MYTH IN QUECHUA COMMUNITIES OF SOUTHERN PERU

Benjamin H. Bridges (Dr. Tom Mould) Department of Sociology and Anthropology

Situated at the intersection of folklore, anthropology and international studies, this ethnographic project explores the relationship between globalization and mythology among the indigenous Quechua in southern Peru. Interviews, participant observation and direct observation were used to collect data relating to how myths are perceived, shared and applied in the Sacred Valley community of Huilloc. Increasing levels of intercultural contact within Quechua communities provide a particularly useful context for understanding how myth functions to guide and respond to new ideas and opportunities. In the context of tourism, myth provides particularly useful commentary on the ways villagers negotiate interactions with tourists and construct a Quechua identity specific to their community through the concepts and images of boundary crossing and wealth. Furthermore, in response to the economic influx associated with tourism, Quechua communities throughout the Sacred Valley have commodified myth, reflecting a pride in Quechua heritage known as *incanismo*. Though this pride correlates with an uptick in the frequency of ritual performances and the presence of mythic figures in textiles, the changing religious context influences who performs such actions and the meaning assigned to them. Recent actions of evangelical missionaries have altered perceptions of ethnic self-identity through myths since such stories hold strong ties to Andean Catholicism, a religion born of the convergence of Andean cosmology and Catholic beliefs. This research contributes to scholarship pertaining to the globalization of indigenous groups, highlighting the important role expressive culture plays in contemporary indigenous communities today.

CALL OF THE WILD: BEHIND THE SCENES OF AN ETHNOGRAPHIC FILM

Benjamin H. Bridges, Sarah M. Kraemer, & Aleksandra R. Zayac (Dr. Tom Mould)
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This project explores the investigative and creative processes that go into the making of ethnographic films, using footage from a student-produced movie, “Call of the Wild,” to explain how emergent themes from the research are developed and presented cinematographically. As part of a Video Ethnography course in Fall 2016, a small team of students researched the culture of the Conservators Center, a nonprofit conservancy located just north of Mebane, North Carolina. With nearly 90 exotic animals representing over 20 species, the Conservators Center is committed to animal care and visitor education, operating under the aphorism, “You protect what you know.” Following a month of interviews and ethnographic observations, the team introduced a camera to document the relationships staff members have with one another and with the animals. The findings indicate that the Center has constructed an occupational environment where the animals are the primary facilitators of organizational order and human-to-human

relationships. Sound calls and socialization processes—methods for fostering community that require direct animal interaction—and positional staff structure rooted in past experience with animals are all powered by an overarching commitment to conservation education for visitors and volunteers. Crafting these ethnographic claims required multiple visits and conversations with staff members, all necessary when attempting to convey the cultural values and norms of a group. With the added filmic element, the team sought ways to employ visual and audial techniques to best express their points. Furthermore, ethical considerations surfaced in the team's decision to share some information and images and not others, inviting questions pertaining to the ethical responsibilities of ethnographic filmmakers. This project aids in understanding the process behind ethnographic filmmaking and the convergence of research and artistry in a cinematic context.

WHAT WE BELIEVE BECOMES WHO WE ARE: AN EXPLORATION OF RACE, ETHNICITY, AND NATIONALITY AMONG ELON STUDENTS

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The differentiation and stratification between social groups based on race, ethnicity, and nationality is accepted by many social scientists as deeply rooted in the structure of American society. Thus, ideas about the nature of race, ethnicity, and nationality have wide-ranging consequences for how individuals understand these social categories as general concepts and as personal identities. Race and ethnicity have a complex relationship within American society, varying in the extent to which the concepts and their attributes are treated as distinct or conflated in the public imagination. In contrast, nationality is widely perceived as a stable concept. The term is most often used in reference to an individual's national origin, which may be influenced by that of one's parents and, to a lesser extent, of one's grandparents. Thus, the purpose of this research was twofold: to explore how Elon students understand race and ethnicity as concepts and as identities; and to explore the connection between students' nationalities and national origin for themselves and for their parents and grandparents. Data were collected from 37 Elon undergraduate students via an online survey. An inductive approach, in accordance with grounded theory, was then used to construct categories that emerged from the survey responses. Analyzing the frequency of responses for each category yielded several findings. Students born in the U.S. were more likely to identify as solely American if none of their parents or grandparents were born outside of the U.S. Conversely, having at least one foreign-born parent or grandparent made it just as likely to identify as some other nationality. For race and ethnicity, the terms respondents associated with each social category were largely exclusive rather than overlapping, and the terms used to conceive of race were distributed across a broader range than those used for ethnicity. Plus, there was an observed difference in the terms associated with race as a general concept and those associated with race as a personal identity. Taken together, these results contribute to a broader understanding about the intricate factors that affect how individuals understand and internalize ideas about race, ethnicity, and nationality in the United States.

“LET’S DO SOMETHING, SAATHI”: THE ROLE OF SOCIAL MEDIA IN SHAPING YOUTH AGENCY IN POST-DISASTER NEPAL

Leena Dahal (Dr. Mussa Idris) Department of Anthropology

Availing themselves of the skills and tools at hand, Nepali youth served as integral agents in the chaotic aftermath of the Gorkha earthquakes that struck Nepal on April 25, 2015. Drawing on ethnographic fieldwork and more than 50 narratives collected in Nepal from youth leaders during the summers of 2015 and 2016, this study delves into how youth conceptualize their agency in online and offline contexts. These narratives highlight the extent to which social media can generate organized and immediate action, especially during crisis situations. Youth agents in Nepal are often categorized as a singular force and entity and thus the many caste, ethnic and gender differences that can suppress or support their participatory capacities are often overlooked. By highlighting the voices of youth agents themselves, this study aims to provide more nuance to the depictions of youth agents by identifying the privileges, social norms and cultural values that are supported or suppressed in agency development in both online and offline digital and physical environments — including gender, socioeconomic status and educational opportunity. It argues that more inclusive social media models are required during crisis situations to inspire participation across ‘offline’ and ‘online’ identities among Nepali youths within their social contexts. Its findings will be useful for understanding the impacts of digital inclusion and exclusion during periods of national crisis, especially in developing countries such as Nepal.

PATERNAL PERSPECTIVES: UNDERSTANDING FATHERS’ EXPERIENCE WITH ALTERNATIVE BIRTH

Anna J. Darnowsky (Dr. Muriel Vernon) Department of Sociology and Anthropology

Alternative birth encompasses any type of birth method or space outside of the biomedical, hospital setting. This includes, but is not limited to, birth center and home birth settings, as well as methods such as a water birth and midwife attended or even unassisted birth. Although situated outside the conventional birthing sphere, alternative birthing methods and spaces provide a safe, legitimate, and often satisfying option for women who seek a more natural birth experience. The factors that influence a woman’s choice to have an alternative birth are well documented; however, a relatively unexplored arena is the father’s perspective of and experience with alternative birth. This exploratory research will be conducted using semi-structured interviews with ideally five fathers whose partners experienced either a home or birth-center birth. The interviews will be transcribed and analyzed through qualitative coding and narrative analysis. This research will examine the experience of fathers whose partners had an alternative birth, and the factors that influenced their perception of an alternative birth. Furthermore, this study will determine the role fathers play in deciding the birthing space, and how their experience contributes to constructing masculinity and acts as a rite of passage into fatherhood. This study will be conducted with the goal of providing insight on the extent to which fathers

participate in decision surrounding a nonconventional birth and the process itself.

NARRATIVES OF NEC: THE IMPACT OF NICU FEEDING PRACTICES ON PARENT DECISION-MAKING

Sarah M. Holdren (Dr. Aunchalee Palmquist) Department of Sociology and Anthropology

The purpose of this study is to reveal how neonatal intensive care unit (NICU) infant feeding policies and practices inform the decision-making processes and experiences of families with premature infants, particularly in regard to the prevention of necrotizing enterocolitis (NEC). Necrotizing enterocolitis (NEC) is the most common prematurity-related gastrointestinal disease. The incidence of NEC varies by hospital and reflects practices implemented to prevent the disease, many of which include late enteral feedings of various forms of nutrition. Breastfeeding is currently considered the best prevention for NEC; however, attitudes and policies that contradict recommendations supporting breastfeeding mothers or providing donor human milk (DHM) to infants are present in the NICU. Participant observation was completed in two level-3 NICUs and field notes were triangulated with semi-structured interviews conducted with parents (7) who had an interest in infant feeding recruited from each NICU; however, not all parents had infants with NEC. These interviews were transcribed and coded using a narrative analysis and grounded theory approach. Findings of this study show that most parents felt supported in their infant feeding decisions, particularly pumping mothers; however, it was noted that pumping mothers often experienced a sense of regret when unable to pump, supporting the common narrative of failure often voiced by NICU parents. Of those parents who did not have an infant with NEC, not all suggested that they had knowledge of the disease or methods of prevention. Concern for NEC varied, with those parents who did not initially intend to breastfeed their infant focusing on non-GI issues instead. Belly-measuring, a NEC prevention practice to ensure that the belly is not distended, was acknowledged by all parents, although some were unsure of the reason for this practice. While this practice was seen during fieldwork, discussions about NEC and belly-distension rarely occurred before diagnosis. This suggests that more education about NEC and its preventative relationship to breast milk should be reinforced. Overall, the findings of this study suggest that more should be done to support families in the prevention of NEC, including explaining NICU ritualistic practices to create a more interactive, family-centered care environment.

“WHAT DO YOU EVEN DO WITH THAT MAJOR?”: INFLUENCES IN THE SOCIOLOGY MAJOR DECLARATION PROCESS

Samantha E. Lubliner (Dr. Rena Zito) Department of Sociology and Anthropology

Unlike previous decades, recruitment and retention of students majoring in the humanities, specifically sociology, is a challenge within American universities. (Little, 2012). Given this changing landscape of major declaration, it is critical to understand the influences that impact major selection. Previous research suggests that familial influence, pressure to achieve

happiness, financial security, and likelihood of excellence all contribute to the major selection process broadly (Beggs, Bantham & Steven, 2008). I propose that all of these previously identified factors will be relevant to sociology selection specifically, but that pressure of employment to be the most frequently named. I analyze two datasets collected at a small, liberal arts university in the southeastern United States. The first dataset was collected through in-depth interviews and focus groups conducted with three distinct sets of students: (1) declared sociology majors, (2) formerly declared sociology majors and (3) students who never declared a major in sociology. The second dataset was collected through the office of the University Registrar and includes open-ended text narratives from students about course selection and major declaration. Data from the interviews and focus groups were analyzed with Dedoose software and are consistent with research which states that employment pressures are in fact most frequently cited. The data reveal four primary themes that guide the choice to major or not major in sociology: (1) Maximization- the idea of getting the most, one's "money's worth" out of the college experience, (2) Fear of Regret- retroactive concerns about one's major and minor combination, (3) Marketability- a desire to be as competitive as possible to future employers, and (4) Financial Security- concerns about future earning potential, even at the cost of present moment experience. Results from the university-wide survey suggest that students feel frustration toward the lack of time given to explore different major options. This research contributes to the findings on influences in student decision-making processes and major selection.

THE LEARNING CIRCLE PROJECT: CULTURAL TRANSFORMATION IN DEMENTIA CARE

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In 2013, a Continued Care Retirement Community (CCRC) in Burlington, NC, began implementing a series of staff workshops called Learning Circles (LC) to improve dementia care. These LC workshops involved improving techniques in approaching residents with dementia, in addition to fostering more efficient, respectful communication between staff members of different employment status: this concept can also be known as therapeutic capital, in which employees, regardless of hierarchical status, feel free to move through social circles at work. Generating therapeutic capital would ultimately improve resident health, since staff members would be working together more coherently. In 2016, management consulted a team of social scientists to assess the efficacy of these ongoing workshops. The first phase of the study focused on staff in the Memory Care Unit and how LC participation (vs. non-participation) has affected caregiving practices: study results show that LC participation generally increases individual caregiving skills, but that collective improvement of caregiving is limited by issues related to interpersonal communication based on differences in race, ethnicity, educational level, seniority and asymmetrical power relationships. This project focuses on the second phase of the study, which will compare Health Care Unit staff to Memory Care Unit staff to assess the efficacy of the workshops in settings with different resident needs, and whether similar improvements and limitations to caregiving can be identified. This study is relevant in analyzing the efficacy and culture of healthcare systems, in particular CCRCs: results of this project would indicate the

success, or lack of success of LCs in fostering work environments that optimize dementia care.

YOUTH & RESILIENCE: EVALUATION OF A NARRATIVE-BASED COMMUNITY INTERVENTION

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This research integrates the importance of resilience with the emphasis on improving the focus of students in school. Research on resiliency has grown in disciplines such as sociology and psychology over the years (Keck & Sakdapolrak, 2013). One strategic setting in which to study resilience is the classroom. The literature suggests that resilience is an important idea that can help students do better in school and extra-curricular activities (Tiet, Huizinga, & Byrnes, 2010). The current research aims to determine if a three-session intervention can focus high school students on their own resilience. Even though there are varying definitions of resilience, the definition used in this study is the ability to recover from setbacks and thrive in the face of adversity. Approximately 70 students ages 14-15, participated in the sessions over the course of one month at a high school in central North Carolina. Two classes of 47 students were included as the experimental group and one class of 21 students as the control group. Survey components included demographic questions, Rosenberg self-esteem scales, and the Resilience Scales for Children and Adolescents (sense of relatedness, sense of mastery, and emotional reactivity). This was a mixed method study; statistical analysis was used to examine the effect of the intervention and qualitative analysis of the personal reflections. After three sessions including reading stories, watching videos, students could grasp a better understanding of resilience as evident by their understanding of the concept and their written personal reflections of resilient times in their past. The quantitative results failed both the hypotheses: that there would be a positive correlation between receiving treatment and resiliency level, and that there would be a positive correlation between receiving treatment and self-esteem level. The qualitative results supported the hypothesis that curriculum on resilience would increase students ability to discuss resilience in their own life. This research is salient because it presents the importance of explicitly teaching about resiliency in schools and teaching students how to (re)discover their own resilience. Future research could focus on embedding resilience curriculum into a variety of subjects to see if students will be increase personal discovery of resilience.

Sport and Event Management

PLAYER DEVELOPMENT: EDUCATION AT MAJOR LEAGUE BASEBALL ACADEMIES IN THE DOMINICAN REPUBLIC

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The Dominican Republic (DR) is a poor country of 11 million people that produces 10% of all the players in Major League Baseball (MLB), including stars like Robinson Cano, Pedro Martinez, David Ortiz and Manny Ramirez. MLB's player development efforts in the DR have

been labelled as neo-colonial and exploitative (Klein, 2014), and portrayed as a “sweatshop” system that exploits young players and tosses them aside when they are no longer major league prospects (Gordon, 2013). The issue of how players are treated and educated in the Dominican academies of MLB teams is important for the industry of baseball, and helps us understand the relationship between the U.S. and the Dominican Republic. Despite the criticisms, many in the industry state that there are significant efforts being made in the educational programs being operated in MLB teams’ academies. To gain a clearer understanding of what is happening in this area, a survey was created (Thomas, Nelson, & Silverman, 2011) asking for information about the time and resources devoted to these efforts and the goals of each team’s educational program. This survey was administered to MLB employees, educational coordinators, and academy directors via in-person interaction, a presentation and subsequent meetings at the MLB Winter Meetings, and through direct contacts at Dominican academies. Data gathering continues, but roughly a quarter of the 30 MLB teams have completed the survey. Preliminary findings shed some light on the current state of education programs in the Dominican academies. A wide range of programs was represented. For example, some teams have 3-6 daily staff members specifically dedicated to language and cultural education, while others have only one part-time contract employee working in education. Some programs culminate with a high school diploma, while others simply aspire to improve the English language skills of the players. The data gathered provide a better understanding of the current state of education programs in the Dominican academies of MLB teams. The results of this research may add to the knowledge of MLB’s practices, and may provide information about best practices and standards that will allow all teams to improve their educational programs.

INJURED STUDENT-ATHLETES’ PERCEPTION OF SOCIAL SUPPORT

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Injury to athletes at a competitive level is often unavoidable. Although student-athletes receive the necessary care to help rehabilitate the physical injury, many studies have found the importance of social support to the athlete’s overall well-being following an injury (Bridges & Beck, 1997; Chwartz, & Vaux, 2000; Gould, Urdy, Hardy & Grace, 1993; Hardy, Richman & Rosenfeld, 1991; Minwaring, 1999; Urdy, 1997). Shumaker & Brownell (1984) defined social support as “an exchange of resources between two individuals perceived by the provider or the recipient to be intended to enhance the well-being of the recipient” (p.21). In a study examining athletes’ social support, Yang, Peek-Asa, Lowe, & Foster (2010) provided a more specific definition which states that social support is “an athlete’s appraisal of the support that might be available to them from their social network and how satisfied they were with that support” (p.374). The purpose of this study is to better understand injured student-athletes’ perception of social support and whether additional resources during their recovery process would enhance the athletes’ overall well-being. Data was collected from semi-structured interviews with student-athletes that have suffered a severe injury. Findings indicate that student-athletes, due to their injury, are forced into a new role on their team. Many of the participants struggled with their new role, which led to a difficult injury recovery process requiring more social support. Those athletes that had a longer recovery or had set backs in their recovery wished they had more social support. Social support from those around them seemed to diminish as the recovery process continued. Participants had an expectation that coaches, trainers, administration and teammates

should be more aware of the support needed. Finally, student-athletes had several recommendations to improve the social support provided during the recovery process.

World Languages and Cultures

DENUNCIATIONS AND DEFENSES OF THE BURKINI: THE CONTROVERSY THAT REVEALS HYPOCRISY IN FRENCH SECULARISM

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Since 2004, an Australian company named Ahiida has sold the “burkini,” a full-body swimsuit resembling a wetsuit with a hood that covers the hair and neck. The burkini is primarily worn by Muslim women who wish to remain modest, as encouraged in Islam. In the context of global acts of terror committed by terrorist groups, however, the burkini has sparked controversy in notoriously secular France. In the French law assuring *laïcité*, or secularism, citizens are also guaranteed the right to religious liberty. In a stated effort to preserve *laïcité*, a principle of French identity, more than thirty French cities on the coast banned the burkini in August 2016, with governments citing various reasons that included safety and hygiene concerns, maintaining public order, and disrespect of societal mores. In this study, I will conduct a close analysis of language used by notable French officials, in public signage prohibiting the burkini and warning of the fining or arrest of burkini-clad women. I will argue that this language reveals the hypocrisy of French secularism, discrimination against Muslims, and the intentional incitation of fear in the French public. I will draw from French laws, scholarly texts, newspaper articles, and political cartoons to illustrate how Muslims are a targeted population in France under the pretext of *laïcité*. This controversy is important to study because, moving forward, it carries larger implications with regard to the way France integrates its multicultural citizens. This presentation will be given in French.

GEOGRAPHIES OF MEMORY AND FORGETTING IN AGNANT’S *LE LIVRE D’EMMA*

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Haitian-Québécois author Marie-Célie Agnant’s *Le Livre d’Emma* contains the narrative of a Haitian woman who has been charged with infanticide and confined to a psychiatric hospital in Montreal, where she is evaluated to see if she is fit to stand trial. What surfaces from Emma’s story, which ebbs and flows between the past and the present, is a narrative of chronic rejection. The reader learns that Emma is painfully rejected by her mother as a child and is later devastated by the rejection of her doctoral thesis on the transatlantic slave trade, which is very much connected to her family history. In this way, Emma is metaphorically expatriated from her lineage, as well as from Historical discourse. Many critics have read Emma’s madness as a function of her inability to overcome her traumatic memory (which includes unconscious trauma inherited from her enslaved ancestors). Furthermore, Agnant’s text strongly suggests that Emma needs to situate her memory into a shared discourse in order to overcome her trauma. The rejection of Emma’s thesis, and by extension of her (collective) narrative, therefore has severe

personal consequences for Agnant's protagonist. Via its examination of Emma's madness and eventual suicide, *Le Livre d'Emma* meditates on the ways in which we imagine our communities, and on the destructive capacity of discourses that rely on an exclusion of difference. Although the text appears to be preoccupied with linear modes of imagining community owing to its tracing of Emma's family history, Agnant's aesthetic considerations betray her deeper inclination toward a different mode of community. This particular mode of community, as defined by Martinican philosopher Édouard Glissant in *La Poétique de La Relation*, relies on continuities of experience situated within a rhizomatic, or synchronic, imaginary. My presentation will place *Le Livre d'Emma* into conversation with Glissant's discourse and will examine the ways in which Agnant, via complex spatial and geographical metaphors, constructs a nascent space of what Glissant calls "Relation." Finally, this presentation will also consider the how the notion of shared space speaks more deeply than shared blood to Antillean realities.

DIE MUSLIME IN DER DEUTSCHEN AUßENPOLITIK: HOW INTEGRATION OF ETHNIC TURKS AFFECTS GERMANY'S FOREIGN RELATIONS WITH TURKEY

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Dominant theories of international relations downplay the influence of cultural and religious minorities on foreign policy decisions. Although the role of displaced ethnic groups in international affairs has been the subject of some studies, much research is needed to understand how these groups influence the foreign policy decisions made by their host country toward their native country (or the native country of their ancestors). This project uses Germany as a case study to explore that influence. I ask whether the German government's stance towards Germans of ethnic Turkish descent (*Deutschtürken*) influences German foreign policy toward Turkey. Using Theory-Guided Process Tracing—a method that examines a sequence of variables to find informative patterns—this project analyzes three major domestic events that seem to influence German foreign policy towards Turkey: the publishing of Thilo Sarrazin's anti-immigrant book *Deutschland schafft sich ab* in August 2010; the massive far-right rallies against the "Islamization of Europe" in January 2015; and the rally in Cologne in support of Turkish president Erdoğan in July 2016. By identifying prevailing themes in these three *domestic* events—themes such as the "otherness" of *Deutschtürken* and concerns about split loyalty between Germany and Turkey—and comparing them to subsequent German *international* decisions regarding Turkey, this project finds that these foreign policy decisions (or, at minimum, aspects of them) are best explained as responses to internal cultural affairs: not only did decision makers regularly utilize language stemming from domestic events, but they also directly addressed the concerns of actors taking part in the events. These results suggest a clear relationship between Germany's domestic cultural debate and its international decision-making process—a finding that provides valuable evidence for the role of cultural and religious minorities in international affairs and that demands further research into this often-neglected aspect of international relations research.

POLITICIAN OR POET? AN ANALYSIS OF THE LITERATURE AND POLITICS OF JUAN EMILIO BOSCH GAVIÑO

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In the Dominican Republic, Juan Bosch is characterized as the father of democracy and narration of stories. Bosch became the first democratically elected president of the Dominican Republic when he was elected in 1963. However, he governed for under a year even though he was very popular with the working class. In addition to his political work, he wrote stories that reflected the violence, poverty, hunger and ignorance of the period. The purpose of comparing his stories with the Constitution of the Dominican Republic is to illustrate the connection between literature and politics, and how Juan Bosch used both in an attempt to implement a new democracy after the regimen of dictator Rafael Trujillo. Bosch used his stories to reveal the political problems in the Dominican reality and tried to positively contribute to these conflicts with constant political activism. There is a connection between the stories of Bosch and his political acts, which are seen through the representation of poverty and lack of opportunities in his stories. This project demonstrates how he tried to find solutions to these realities through a consciousness of participative democracy, reforms to the constitution and radical agrarian change. His literature was the catalyst to these political acts.

THE CONSTRUCTION OF NARRATIVE AS THE DECONSTRUCTION OF THE AUTHOR IN *DRAGON AGE: INQUISITION*

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Roland Barthes proposes that the view of the author as a significant element when analyzing literature is a construct of modern society and that texts should be read in a way where the author has no influence on its meaning. According to Barthes' argument, this freedom from authors enables texts, and, as will be argued below, games, to be interpreted more fully by those who play them since they are not constrained by the author when making sense of the text. Our study takes Barthes' idea of the death of the author and applies it to the methods players use to interpret the narratives at work in the large role-playing game *Dragon Age: Inquisition*. The intricate nature of the narrative that drives *Dragon Age: Inquisition* arguably classifies the game developers' creative product as a literary work. To accomplish our analysis of video games as a fictitious medium in which narrative meaning and direction are controlled by the player, we will utilize the ideas presented by Barthes as our primary theoretical framework. In keeping with Barthes' theory, the narrative pieces and story arcs made available by the game developers can then be seen as the building blocks used by players to create reincarnations of contextual meaning unique to each player. We anticipate to find that Barthes' "death of the author" successfully predicted the trend in role-playing video game narratives in which players create meaning from story fragments provided by developers. While the overarching narratives at the heart of the game remain the same, each player can categorically state that they experienced a different game by virtue of the ability to make choices that affect the course of the story.

SUENAS COMO UN GRINGO: EL EFECTO DE LA AMENAZA DEL ESTEREOTIPO EN LA COMPETENCIA ESCRITA DE LOS ESTUDIANTES DE ESPAÑOL EN ELON

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Cuando estudié en el extranjero por un semestre, recibí muchos comentarios negativos sobre mi acento y quería saber si estos comentarios fueron perjudiciales para mi aprendizaje de español o no; de esta curiosidad crece la pregunta “Afecta el efecto de la amenaza del estereotipo a los estudiantes de un idioma?”. Se define la amenaza del estereotipo como un empeoramiento en la competencia de un grupo de personas cuando se pone énfasis en una parte de su identidad que está asociada con un estereotipo negativo. Por ejemplo, si un maestro dice a sus estudiantes que las chicas son malas para las matemáticas justo antes de un examen de matemáticas, las chicas lo harán peor (Ortiz Elías, 2015). Un estudio previo encontré un efecto similar en las competencias lingüísticas de un grupo de italianos en tareas de alemán (Paladino et al., 2009). Este estudio propone la hipótesis que, frente a la amenaza de estereotipo, los estudiantes de español tendrán resultados peores en una tarea escrita de español en relación a aquellos estudiantes que no han sufrido la amenaza. Para esta investigación se centra en estudiantes de Elon que se identifican como norteamericanos y que están en clases de los niveles de 300 de español. Una mitad de los participantes están en la condición de la amenaza y leen un texto que activa un estereotipo negativo que los estadounidenses son malos para las lenguas. La otra mitad leen un texto neutral antes de la actividad escrita. En contraste a la hipótesis, la diferencia en el número de errores por palabra entre el grupo de la amenaza y el grupo del control en la tarea escrita no era significativa. Los resultados de este estudio pueden iluminar la manera en que los estadounidenses reaccionan a los estereotipos negativos y cómo estas reacciones revelan características de la sociedad estadounidense.

DON DU SANG ET LES DROITS DES HOMOSEXUELS EN FRANCE ET AU MAROC

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In 2015, France lifted a 30-year ban that excluded homosexual men from donating their blood. France is considered a relatively progressive country concerning homosexuality: for example it was the 13th country worldwide that legalized gay marriage in 2013 (before the United States). However, the new blood donation law still contains discriminatory stipulations towards homosexual men. My research compares France’s socio-political climate and laws with respect to homosexual blood donation to Morocco’s, a Francophone country where homosexuality is illegal. France’s new law has led to many discussions within the country and abroad, especially concerning the social implications of the law. By examining the language used in the written laws regarding homosexuality, the blood donation laws for homosexuals, blood donor questionnaires, and articles about this topic from each country, I was able to discern current cultural perspectives on homosexuality. My analysis showed that while France is more socially progressive than Morocco, French blood donation laws still classify homosexuals by their sexual orientation instead of looking at each person individually. Furthermore, while the laws are influenced by scientific data, my research suggests that they also account for many social perceptions that do not align with science. In conclusion, although France’s new blood donation law is a step towards impartiality, it still stigmatizes the homosexual population.