Spring Undergraduate Research Forum

Welcome to SURF 2015

The 22nd Annual Celebration of Achievements in Undergraduate Research at Elon University

The **S**pring **U**ndergraduate **R**esearch **F**orum 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, over 177 proposals for presentation were submitted for presentation. These abstracts were submitted after having been reviewed by two Elon faculty with disciplinary expertise.

SURF is an integral part of CELEBRATE! STUDENT ACHIEVEMENTS IN ACADEMICS AND THE ARTS – a weeklong series of events that brings to light the wonderful diverse academic and creative pursuits in which our students engage each year.

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
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Dr. Sarah Glasco
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Dr. Meredith Allison and Dr. Paul Miller
Undergraduate Research Program

Undergraduate Research & Creative Endeavors includes 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.

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PROGRAM LISTING by SESSION and TIME

ABSTRACTS BY DEPARTMENT

Poster Session I

8:30am - 10:30am; Authors Present 9:00am - 10:30am

McKinnon Hall

Anna Patterson (Dr. Alexis Franzese)
Resilience In Children: Evaluation Of Narrative-Based Community Interventions

Josh Kaufmann (Dr. Alexis Franzese)
Authenticity, Sexual Orientation, And Mental Health Among College Students

Patrick Wheeler and Meghan Clark (Dr. Antonio Izzo)
Differential Heat Resistance Of Fungal Isolates Collected From Elon University

Sarah E. Paille-Jansa (Dr. Aunchalee Palmquist)
Embodiment Of Inequality: Exploring Cultural Constructions Of Childbirth And The Prenatal Decisions Of Expectant Mothers

Catherine T. Palmer (Dr. Aunchalee Palmquist)
People, Plants, And Breastfeeding; The Contemporary Use Of Botanicals In Management Of Low Milk Supply Among Health Care Providers And Breastfeeding Mothers

Tom Riley (Dr. Benjamin Evans)
Magnetically Stimulated Release Of A Model Drug From A Magnetic Drug Carrier

David T. Han (Dr. Benjamin Evans)
Superparamagnetic Silicone Microspheres For Applications In Biotechnology

Aaron J. Neaves (Dr. Benjamin Evans)
A High-Surface-Area Active Microarray For Biosensing Applications

Anne Barker (Dr. Tonmoy Islam)
Effect Of The Gender Wage Gap On Women's Choice Of Major

Anna E. Lewis (Dr. Brandon Lunk)
Attitudes Of Life Science Majors Toward Computational Modeling In Introductory Physics

Chelsea McQueen (Dr. Buffie Longminre-Avital)
Race-Related Stress And Its Relationship To Obesity Risk Behaviors For Emerging Adult Black American Women

Georgia E. Lee (Dr. Carmen Monico)
Knowledge And Skills Of Elon Students Surrounding Sex Trafficking And Labor Exploitation Issues: Implications For Human Trafficking Education And Prevention Among College And University Students

Kara G. Soler-Sala (Dr. Caroline Ketcham)
Neurocognitive Function In Club Sport Student-Athletes With Attention Deficit Disorder And History Of Concussions

Amy Heaton (Prof. Crista Arangala)
Linear Algebra Possibilities In The Common Core Curriculum

Poster Session I….*continued*

Elizabeth C. Bailey (Dr. Cynthia Fair)
Health Care Transition For Children With Special Health Care Needs: Provider Perspectives On Parent Outcomes

Meredith Berk (Dr. Cynthia Fiar)
Provider Perceptions Of Stigma And Discrimination That Adolescent And Young Adult, Hiv-Positive Patients Encounter In Health Care Settings

Bailey E. Nugent (Dr. Cynthia Fair)
"Control Your Diabetes, Don't Let It Control You": College Experiences Among Students With Type 1 Diabetes.

Alexandra Broadstone and Shoshana Trager (Dr. David Buck)
Perceptions Of Transgender Individuals: Internal And External Descriptions As Predictors Of Prejudice

Marguerite Rix (Prof. Elizabeth Bailey)
The Effect Of Participation In A Mentor Based Health Education Program On Self-Esteem And Perceived Influences On Body Image In Middle School Girls

Lily A. Savoie (Prof. Elizabeth Bailey)
The Discrepancy In Nutrtion Between Underclassmen And Upperclassman In Relation To The Residential Environment

Ashley M. Brown (Dr. Eric Hall)
Cultural Competency And Relationship Effects Between Athletes And Coaches

Kayla Harvey (Dr. Eric Hall)
Potential Factors Influencing Recovery From Concussion In Collegiate Student-Athletes

Evan Lutvak (Prof. Jack Smith)
The Effect Of Sound Design On Theatrical Productions

Rebecca M. Schneider (Dr. Kathryn Matera)
The Oxidative Mechanism Of Docosahexaenoic Acid: The Relationship To Attention Deficit Hyperactivity Disorder

Sarah Woidill (Dr. Kathryn Matera)
The Fight Against Alzheimer's Disease: Combatting Aβ Aggregates Synthesized On Latex Beads

Megan Sibree (Dr. Linda Niedziela)
Environmental Toxicants N-Nitrosodimethylamine (Ndma) And N-Ethyl-N-Nitrosourea (Enu) Cause Chromsome Instability In Zebrafish (Danio Rerio) Revealing A Possible Molecular Mechanism For Carcinogenesis

Emily R. Tomich (Dr. Matthew Clark)
Evaluation Of Moringa Oleifera As A Recovery Method For Malnutrition

Cecily Basquin (Dr. Meredith Allison)
Testimony Accuracy And Communication Processes Of English-As-A-Second-Language Eyewitnesses

Nicholas de Castro (Dr. Michael Kingston)
Population Structure Of The Scalloped Hammerhead (Sphyrna Lewini) And Carolina Hammerhead (Sphyrna Gilberti) In North Carolina Coastal Waters.

Poster Session II

3:30pm - 5:30pm; Authors Present 4:00 pm – 5:30pm

McKinnon Hall

Madeline C. Wise, Lindsey M. Christman, and Valeria Rizzi (Dr. Eugene Grimley)
Characterization And Identification Of Flavonoids In Poplar Honey

Danielle L. Basirico (Prof. Jane Wellford)
Drama Workshops For Youth

Kasey Llorente (Dr. Jennifer K. Uno)
The Effect Of Valproic Acid On Notch Signaling In Adult Zebrafish Intestinal Cell Differentiation

Kaylyn D. Tousignant (Dr. Jennifer K. Uno)
The Effect Of Obesogens On The Microbiota And Systemic Health In Zebrafish

Adam Maloney (Dr. Joel Karty)
Why Is Sulfuric Acid A Much Stronger Acid Than Ethanol?

Chelsea T. Gemme (Dr. Joyce Davis)
The Effect Of Foot Strike On Leg Muscle Activity When Running Barefoot

Ana Preciado (Dr. Kacy Kim)
How to Drive Website Traffic and Encourage Online Purchases: An examination of online environment in the apparel industry

Amy L. McCurdy (Dr. Alexis Franzese)
A Sociological Analysis Of The Impact Of Adoption On Family Completion

Nicole Panaggio (Dr. Alexis Franzese)
Patient-Doctor Relationships Around Contraceptive Choices In Women Discontinuing Reproduction

Matherly Gainer (Dr. Amanda Sturgill)
Tweeps As Sources: A Comparison Of Legacy And New News Outlets

Sara B. Rosenthal (Dr. Mark Enfield)
Connecting Educational Values To Create A Learning Community With Students At A Housing Authority

Grace I. Hanlon (Dr. Cara McFadden)
Attendance Behavior At Collegiate Football Games: A Mixed-Methods Approach

Nicholas Mastrocola (Dr. Michael Strickland)
Identifying And Assessing The Environmental Impact Of Invasive Plant Species Found At The Glencoe Section Of The Haw River Trail

Poster Session II….*continued*

Sarah Vaughan (Dr. Michael Terribilini)
Guardian Of The Genome: Computational Modeling Of P53 Interactions With S100b

Sara M. Hess (Dr. Paul Fromson)
Exploration Of The Pit Bull Stigma In An Online Environment: An Analysis Of Impression Formation And Online Discussion Groups

Anna E. Stapleton and Jennifer N. Gehrin (Dr. Paul Miller)
The Effects Of Citrulline Malate Supplementation On Muscle Soreness And Contractile Function

Christian Seitz, Mai-Thi Nguyen-Kim, Jannik Borghs, and Jan Wallenborn (Dr. Alexander Boeker)
Multifunctional Polyurethane Hydrogels For Biomedical Applications

Ben C. Hay and Jake Smith (Dr. Scott Wolter)
Quadcopter Control Through Integration Of Arduino Technology

Alex T. Simoneaux, Jake K. Smith, and Christopher S. Brittlebank (Dr. Scott Wolter)
Small Signal Amplification For Larger Circuit Control

Cory M. Nagel (Dr. Sean Giovanello)

Changes In Alliance Politics: A Study Of The United States Resolution To Ratify The North Atlantic Treaty Organization

Emily L. Messerschmidt (Dr. Srikant Vallabhajosula)

Changes In Gait Are More Sensitive To Current Symptoms Than History Of Concussion Among Student-Athletes

Pari T. Shah (Dr. Beth Warner)

Mentors In Violence Prevention: Awareness Vs. Understanding

Drew J. Forte (Dr. Tony Weaver)

Higher Education Administrators' Perceptions Regarding The Role Of Club Sports In The Recruitment And Retention Of Male Students

Kathryn L. Jeffords (Dr. Vanessa Bravo)

United States' Television Goes Global: The Case Of Spain

Poster Session II….*continued*

Sam Hershberger (Drs. Paul Miller & Eric Hall)

The Effects Of Fish Oil Supplementation On Cognitive Function

Julianne Erickson (Dr. Chris Leupold)

Core Self Evaluations, Academic Burnout, And The Moderating Effect Of Perceived Organizational Support

Session I (10:40 am - 12:20 pm)

LaRose Digital Theatre (Moderator: Chelsea McQueen [Dr. Buffie Longmire-Avital])

10:40 am **Emily J. Benson** (Dr. Catherine King)
Parents' Perceptions of the Transition to Adulthood for Young Adults with Intellectual Disabilities in Family and Community Contexts

11:00 am **Laura N. Castro** (Dr. Catherine King)
The Transition to Adulthood in Colombian Immigrants: Ethnic Identity, Family Obligation and Their Effect on Career Aspirations

11:20 am **Kristen Iler** (Dr. Thomas Green)
Implicit Learning and Mental Rehearsal in a Predictive Motor Task

11:40 am **Brenda Reavis** (Dr. Buffie Longmire-Avital)
"Deep like the Sea and Strong like the Earth": Exploring the Ideal Partner Characteristics of Young Adult Heterosexual Black Women

Koury Business Center 208 (Moderator: Michelle Alfini [Dr. Glenn Scott])

10:40 am **Julia Lescarbeau, Holly Weiler, Alex Hunter, and Rachel Miller** (Dr. Frances Ward Johnson)
A Call to Action for Civil Rights Education: Bridging the Civil Rights Knowledge Gap of Yesterday and Today

11:00 am **Kathleen Caler** (Dr. Laura Roselle)
Winning the Games: Media Framing in the Olympic Bid Process

11:20 am **Sean R. Woolley** (Dr. Frances Ward Johnson)
Advertising Ambush: The Extent and Effects of Brand Placement in Children-Focused Internet Advertising

11:40 am **Brett T. Gubitosi** (Dr. Pamela Winfield)
Interpreting Neon Genesis Evangelion Through and Anti-Western Lens

12:00 pm **Michael Papich** (Dr. Glenn Scott)
Analyzing Framing in Elon University Student Journalism

Koury Business Center 211 (Moderator: Sarah Gilley [Dr. David Vandermast])

10:40 am **Jessica E.H. Brown** (Dr. Linda Niedziela)
Pesticide Carbaryl Reduces Social Behavior in Zebrafish

11:00 am **Chloe Connolly** (Dr. David Vandermast)
The Impacts of Ice Storm Damage to the Structure and Composition of Elon University Forest

11:20 am **Lauren C. Corbin** (Dr. Greg Haenel)
Frequency of Molecular Mechanisms of Insecticide Resistance in Myzus Persicae

11:40 am **Timothy M. Demers** (Dr.Linda Niedziela)
Oil Dispersant Disrupts ZATP 1A.1A.A ATPASE Expression within the Skin and Gills of Zebrafish

12:00 pm **Michael Shoemaker** (Dr. Linda Niedziela)
Expression of ATPASE Gene ZATP 1A.1A.5 in Danio Rerio Gill and Skin as Altered by Exposure to Oil Dispersant

Koury Business Center 242 (Moderator: Jeremy Revelise [Dr. Steven Bednar])

10:40 am **Caroline Crew** (Dr. Steven Bednar)
Does Tourism Alleviate Poverty? Evidence From UNESCO World Heritage Sites

11:00 am **Jennifer Smith** (Dr. Steve DeLoach)
Married to the Job: Allocation of Time and Household Production for Fully Employed Couples

11:20 am **Kate Smith-Lin** (Dr. Steve DeLoach)
Microfinance in Indonesia: The Impact of Formal Banking Services on Households' Portfolio Decisions

11:40 am **Matthew Trogdon** (Dr. Mark Kurt)
Investigating Impact of Verbal Motivation and Paycuts on Worker Performance

12:00 pm **Richard S. Segal** (Dr. Paula Weller)
High School Financial Literacy in North Carolina

Koury Business Center 244 (Moderator: Sarah Woidill [Dr. Sara Triffo])

10:40 am **Christian Seitz** (Dr. Joel Karty)
Why Does the Acetaldehyde Enolate Favor Reaction at the Oxygen Atom During Gas-Phase Nucleophilic Substitution? Contributions by Resonance and Inductive Effects

11:00 am **Samantha Coffer** (Dr. Sara Triffo)
Lipid Anchor Organization within Cell Membranes

11:20 am **Taylor A. Glenn** (Dr. Kathryn Matera)
Determining the Mechanism of Oxidation of β-Estradiol By Lactoperoxidase

11:40 am **Alyssa Romano** (Dr. Karl Sienerth)
Measurement of the Efficiency of Ruthenium and Osmium Compounds Toward the Catalytic Synthesis of Benzimidazole

12:00 pm **Taylor A. Davis** (Dr. Victoria Moore)
Understanding the Apoptotic Potential of Heart Cells

Session I (10:40 am - 12:20 pm) *…continued…*

Koury Business Center 310 (Moderator: Lauren Shaver [Dr. Svetlana Nepocatych])

10:40 am **Jordan Cottle** (Dr. Eric Hall)
Neurocognitive Performance and Concussions: Influence of Headaches, Migraines, Depression, Anxiety, Attention Deficit Disorders and Exercise

11:00 am **Ann Marie Nunnelee, Katie Umbdenstock** (Dr. Svetlana Nepocatych)
Effects of Pre-Exercise Energy Bar on 10K Running Performance

11:20 am **Christine Treseler** (Dr. Svetlana Nepocatych)
The Effect of Compression Socks on Running Performance in Recreational Female Runners

11:40 am **Megan T. Flynn** (Dr. Eric Hall)
All Work and No Play? How the Psychology Behind Workplace Pedometer-Based Programs Can Predict Adherence

12:00 pm **Lauren E. Packard** (Dr. Caroline J. Ketcham)
Mirror Neuron System Activation in Dancers: Implications for Observational Learning

Koury Business Center 353 (Moderator: Benjamin Lutz [Dr. Brian Pennington)

Religion in Contemporary American Society Symposium

10:40 am **Pamela C. Gutermuth** (Dr. Sean Giovanello)
Conflicting Priorities: The Moral and Security Implications of Religious Freedom on United States Foreign Policy in Sudan

Elizabeth Bargamian (Dr. Lynn Huber)
Call and Response, Ambiguous Language, and Sampling: Usage and Function in Spirituals and Rap Music

Daniela Sostaita (Dr. Brian Pennington)
Transcending the Hyphen: The Growth of Latino Protestantism in the United States

Koury Business Center 355 (Moderators: Ben Bridges and Caley Mikesell [Dr. Tom Mould])

Ethnography Across the Disciplines: Global Citizenship, Local Engagements Symposium

10:40 am **Rachel N. Shippee** (Dr. Michael Matthews)
Justin Brown (Dr. Amy Allocco)
Leena Dahal (Dr. Mussa Idris)
Omolayo N. Ojo (Dr. Tom Mould)
Ethnography Across the Disciplines

Yeager Auditorium (Moderator: Quinn Czejkowski and Kate Phinney [Prof. Lauren Kearns])

10:40 am **Rachel Mehaffey** (Prof. Lauren Kearns)
Exploring Rhetorical Agency in University Dance Students

11:00 am **McKenna May** (Prof. Jen Guy Metcalf)
Relational Choreography Exploration

11:20 am **Rachel Zain** (Prof. Jen Guy Metcalf)
And Then…

Session II (12:40 pm - 2:20 pm)

LaRose Digital Theater (Moderator: Alex Vandermaas-Peeler [Dr. Jason Husser])

12:40 pm **Mary Rouse** (Dr. Laura Roselle)
Saying One Thing, Doing Another: Hypocrisy In The Foreign Policies Of The United States And Soviet Union

1:00 pm **Shannon A. Temlak** (Dr. Jason Husser)
To Green or Not to Green: Understanding Variation in Climate Change Policy Adoption by U.S. States

1:20 pm **Gabriela Alvarez** (Dr. Laura Roselle)
Mitt Romney: The Struggle To Frame An Immigration Message For Hispanics

1:40 pm **Emily Haley** (Dr. Laura Roselle)
Hillary Clinton's Media Portrayal In Different Roles

2:00 pm **Nicholas C. Massey** (Dr. Laura Roselle)
Twelve Minutes To Mid-Knight: The Cold War, Chess, And The Evolving Media Coverage Of Bobby Fischer

Koury Business Center 200 (Moderator: Sterling Voynick [Dr. Sophie Adamson])

12:40 pm **Astrid A. Adriaens** (Dr.Sophie Adamson)
L'envahissement Du « Franglais » Dans Les Médias : Perceptions De La Génération « Y » En France Vis-A-Vis La Langue Française (The Invasion Of "Franglais" In The Media: Perceptions Of The French Millennials Toward The French Language)

1:00 pm **Astrid A. Adriaens** (Dr. Olivia Choplin)
L'idée Du Relativisme Moral Par Rapport A La Liberté Sexuelle En France (The Ideology Of Moral Relativism As It Relates To France's Liberal Sexual Culture)

1:20 pm **Caleigh Erickson** (Dr. Olivia Choplin)
La Recherche Du « Moi » Dans Les Films De Cedric Klapisch (The Search For « Me » In Cedric Klapisch's Films)

1:40 pm **Emily Lengel Hackman** (Dr. Olivia Choplin)
Voies Différentes, Voix Différentes: Deux Approches Au Féminisme Dans Le Monde Des Affaires

2 :00 pm **Eliza Brinkley** (Dr. Olivia Choplin)
Les Representations Litteraires Des Changements Historiqes Dans La Societe Francaise: Le Ventre De Paris Et Une Vie

Koury Business Center 208 (Moderator: Maryclaire Schulz [Dr. Lucinda Austin)

12:40 pm **Chelsea Lindsay** (Prof. Nicole Triche)
Jet Stream : An Analysis Of The Z-Fill Method For 2d-To-S3d Animation Conversion

1:00 pm **Mia G. Watkins, Skyler A. Cowans, Adrianne M. Haney, Brian A. Mezerski, Jason M. Puckett** (Dr. Anthony Hatcher)
Global Leaders Reiterate Historic Internet Principles As Crucial To Its Future Evolution

1:20 pm **Anjelique T. Kyriakos & Rebecca A. Phillips** (Dr. Lucinda Austin)
Privacy On A Public Platform: A Case Study Of The Ethics Behind Facebook's Massive-Scale Emotional Contagion Research

1:40 pm **Katherine Blunt** (Dr. David Copeland)
Unrecognized Potential: Media Framing Of Hitler's Rise To Power, 1930-1933

2:00 pm **Stephanie A.N. Bedard** (Dr. Harlen Makemson)
The Canadian Missile Crisis: Framing Of The 1962 Cuban Missile Crisis By Canadian Newspapers

Koury Business Center 211 (Moderators: Bethany Davis and Sarah Vaughn [Drs. Yuko Miyamoto and Victoria Moore])

12:40 pm **Margaret E. DeMonia** (Dr. Yuko J. Miyamoto)
Examinining The Effects Of Pi3k Inhibitor Px-866 On Pi3k Signaling In T Cells

1:00 pm **Rosemary Kelley** (Dr. Michael Terribilini)
Computational Analysis Of Aggregation Of Fus And Tdp-43 Proteins Involved In Amyotrophic Lateral Sclerosis (Als)

1:20 pm **R. Patrick Lyon** (Dr. David Gammon)
The Evolution Of Vocal Mimicry In The Northern Mockingbird

1:40 pm **Thomas Lampl** (Dr. Victoria Moore)
Investigation Of The Cellular Mechanism Of Apoptosis In Renal Failure During Sepsis

2:00 pm **Kate E. Rasmussen** (Dr. Sara Triffo)
Investigating The Effects Of Cell Membrane Organization On The Localization And Interactions Of Lipid-Anchored Fluorescent Proteins In A Model Membrane

Koury Business Center 242 (Moderator: Colby Halligan [Dr. Ryan Kirk])

12:40 pm **Aidan Ganzert** (Dr. Honglin Xiao)
Localized Urban Development Impacts On Glacier Melt: A Case Study Of Lijiang, China

1:00 pm **James G. Johnston, Garrett V. Esler, & Joseph P. Milone** (Dr. Janet MacFall)
Center For Environmental Studies (Loy Farm) Comparative Yield Study

1:20 pm **Eric Lagueruela** (Dr. Ryan Kirk)
How Many People Could Grow Biointensive Urban Agriculture Techniques Feed in Burlington, NC?

1:40 pm **Susie C. Masecar** (Dr. Amanda Chunco)
Diversity vs. Sustenance: How Mammalian Diversity and Abundance Correlate with Agricultural Practices

2:00 pm **Helen C. Peplowski** (Dr. Ryan Kirk)
Stream Geomorphology Of Low Flow Headwater Streams In Paired Urban And Exurban Watersheds

Session II (12:40 pm - 2:20 pm) ...*continued...*

Koury Business Center 244 (Moderator: Ben Kaiser [Dr. Chris Richardson)

12:40 pm **Peter L Jakes** (Dr. Chad Awtrey)
Degree Six Polynomials And Their Solvability By Radicals

1:00 pm **Madeline M. Edwards** (Dr. Jeffrey Clark)
Derivative Sign Patterns For Infinitely Differentiable Functions In Three-Dimensions

1:20 pm **Elise Pippert** (Dr. Jeffrey Clark)
Properties Of Self-Avoiding Random Walks In Two And Three-Dimensions

1:40 pm **Helen Meskhidze** (Dr. Chris Richardson)
An Atlas Of Starburst Galaxy Emission Lines

Koury Business Center 310 (Moderator: Audrey Griffith [Dr. Lynn Huber])

12:40 pm **Claire A. Lockard** (Dr. Anthony Weston)
Reimagining Diversity: Toward A More Aspirational Alternative In Higher Education

1:00 pm **Emily Cinquemani** (Dr. Kathy Lyday)
The Everyday Epic: Mythological Borderlands And Odyssean Resonances In Fred Chapell's I Am One Of You Forever

1:20 pm **Hannah Silvers** (Dr. Kathy Lyday)
A Good Name Is Hard To Find: Onomastics In Flannery O'connor's A Good Man Is Hard To Find

1:40 pm **Carolyn Braganca** (Dr. Janet Myers)
"The Most Perfect Reasoning And Observing Machine": Idealized Masculinity In Arthur Conan Doyle's Sherlock Holmes Short Stories

2:00 pm **Max J. Whelan** (Dr. Lynn Huber)
Cross Examination: Belief, Witnessing And Change In The Martyrdom Of Saint Maximilian Kolbe

Koury Business Center 346 (Moderator: Amy Heaton [Prof. Jan Mays])

12:40 pm **Gia Pineda** (Dr. David Crowe)
Hannah Höch

1:00 pm **Stephanie Gallagher** (Dr. David Crowe)
Education In China

1:20 pm **Sarah C Zierhoffer** (Prof. Jan Mays)
A Case Study Of Project-Based Learning In Secondary Mathematics Classrooms

1:40 pm **Jenna Gilder** (Dr. Heidi Hollingsworth)
The Use Of Adapted Puzzles On The Attention Span Of Children With Autism Spectrum Disorder And Down's Syndrome

Session II (12:40 pm - 2:20 pm) …*continued…*

Koury Business Center 353 (Moderator: Addison Horner [Prof. Clay Stevenson])

12:40 pm **Nicole Payne Mota** (Dr. Victoria Fischer Faw)
¡Que Viva el Ritmo!: Exploring Afro-Cuban Traditions in Contemporary Cuban Music

1:00 pm **Brooke E. Jenkins** (Prof. Clay Stevenson)
Songwriting And Arranging In Styles Of Popular Music

1:20 pm **Zane Phillips** (Prof. Fred Rubeck)
Lingua Vitae: A Dramatic Exploration Of Language Extinction

1:40 pm **Jake Sokoloff** (Prof. Jane Wellford)
They Can't Take That Away From Me: Stories From An Unforgettable Generation

Koury Business Center 355 (Moderator: Kathleen Hupfeld [Dr. Caroline Ketcham])

Social Contexts of Development Symposium

12:40 pm **Melissa Mischka** (Dr. Maureen Vandermaas-Peeler)
Parental Support Of Young Children's Scientific Reasoning Through Inquiry Guidance

Kaitlin R. Sands (Dr. Maureen Vandermaas-Peeler)
Mathematical Learning In Early Childhood: Parental Guidance During Virtual And Physical Games

Molly E. Burgoyne (Dr. Caroline Ketcham)
Cultural Context Of Learning: The Physiological Mechanisms Of Therapy Ball Seating On Classroom Performance

Hannah M. Allen (Dr. Cynthia Fair)
Intergenerational Impact Of Hiv: Perceptions Of Adolescents With Perinatally-Acquired Hiv On Parenting And Their Childrens' Futures

Mackenzie Zendt (Dr. Cynthia Fair)
"I'm Afraid What The Kid Is Going To Have": A Qualitative Study Of Relationship And Childbearing Perspectives Among Hispanic American Adolescents With Perinatally-Acquired Hiv

Session III (2:40 pm – 4:20 pm)

LaRose Digital Theatre (Moderator: Abigail Dalton [Dr. Cara McFadden])

2:40 pm **Sarah E. Paille-Jansa** (Dr. Jason Husser)
What's Intellectual Climate? A Case Study Conceptualizing, Measuring, and Examining Factors of Campus Culture.

3:00 pm **Michael Papich** (Dr. Laura Roselle)
Defacing History: Analyzing Damnatio Memoriae

3:20 pm **Kelly E. Swaim** (Dr. Laura Roselle & Dr. Harlen Makemson)
The Great Enigma: How American History Textbooks Portrayed The Cold War

3:40 pm **Lori Schachle** (Dr. Kenneth Fernandez)
Student, Faculty, And Staff Perceptions Of Higher Education Policies To Promote Inclusive Community

4:00 pm **Matthew Feather** (Dr. Cara McFadden)
The Factors Influencing Major League Soccer: A Socioeconomic Sustainability Model

Koury Business Center 200 (Moderator: Vaughn Vreeland [Dr. Olivia Choplin])

2:40 pm **Powell Mansfield** (Dr. Olivia Choplin)
Portraits Of Parisians: A Look At The Global Representation Of The City Through Media

3:00 pm **Madeline D. Monaco** (Dr. Olivia Choplin)
Cuisine As An Ingredient Of Comedy: An Analysis Of The Works Of Mohamed Fellag And His Representation Of Couscous As A Metaphor For Society

3:20 pm **Jordan Grover** (Dr. Jason Kirk)
Model Cities In Honduras: Retreat Or Redistribution Of State Power

3:40 pm **Katherine Shafer** (Dr. Michael Matthews)
Perceptions Of Haitian Immigration And Labor In The Dominican Republic From The 1990s To Today

4:00 pm **Meaghan Walsh** (Dr. Jason Kirk)
Eurozone Crisis and the Catalan Independence Movement -- What's the Connection?

Session III (2:40 pm – 4:20 pm) …*continued…*

Koury Business Center 208 (Moderator: Hunter Benson [Prof. L.D. Russell])

2:40 pm **Pamela C. Gutermuth** (Dr. Pamela Winfield)
Mapping Buddhism In Rural America

3:00 pm **Laurel S. Wiebe** (Prof. L.D. Russell)
The Sacred Space Of Conversation: Cross Cultural Communication And Protection Of Identity In 21st Century France

3:20 pm **Kaitlin Stober** (Dr. Alexis Fransese)
The Role Of Developmental Disability In Family Completion

3:40 pm **Natalie Sipala** (Dr. Judy Esposito)
Cross-Cultural Empathy Of Undergraduates: The Impact Of A Play Therapy Service Learning Course

Koury Business Center 211 (Moderator: Daniel Schneider [Dr. Megan Squire])

2:40 pm **George W. Smith** (Dr. David Powell)
Utilizing Responsive Web Design To Create A Common Code Base To Support Multiple Devices For Nutrigen's Existing Pong System

3:00 pm **Samuel Toma** (Dr. Shannon Duvall)
Engineering An Online Multiplayer Game That Enhances Classroom Learning

3:20 pm **Robert Menke** (Dr. Megan Squire)
Identifying The Source Of An Anonymous Revolution

3:40 pm **Rebecca Gazda** (Dr. Megan Squire)
Designing And Building An Irc Bot That Summarizes Software Developer Conversations

4:00 pm **Robin French** (Dr. Chad Awtrey)
A New Algorithm For Galois Groups Of Quintic Polynomials

Koury Business Center 242 Philip Carret Thomas Jefferson Essay Contest Award Winners (Moderator: Dr. Cassie Kircher)

2:40 pm

Session III (2:40 pm – 4:20 pm) …*continued…*

Koury Business Center 346 (Moderator: Gia Pineda [Dr. David Crowe])

2:40 pm **Chloe E. Eastwood** (Dr. David Crowe)
No Monopoly On Hatred; Slovak Collaboration In Instituting The Holocaust

3:00 pm **Katharine I. Fredricksen** (Dr. David Crowe)
Comparison Of The Plight Of Children In The Warsaw And Lodz Ghettos From 1940-1945

3:20 pm **Julie C. Phillips** (Dr. David Crowe)
A Battlefield Made Of Paper And Ink: The Role Of Newspapers As A Forum For Political Debate During The Campaign Against Sexism In The Irish Constitution Of 1937

3:40 pm **Alyssa Baxter** (Dr. David Crowe)
Propaganda & The Nazi Woman: Roles, Images & Expectations Of Nazi Women During The Nazi Era

4:00 pm **Katherine V. Bouchard** (Dr. David Crowe)
Jewish Resistance Of The Holocaust

Koury Business Center 353 (Moderator: Taylor Davis [Dr. Dave Gammon])

The Genomics Revolution and Society Symposium

2:40 pm **Paloma A. Jenkins** (Dr. Michael Terribilini)
Exploring The Next Generation Of Genome Sequencing

Briana Pfeuffer (Dr. Dave Gammon)
Receiving A Personalized Genome Analysis- A First Hand Account

Stephen J. Bianchi (Prof. Gary Palin)
Genomics In The World Of Entrepreneurship

Koury Business Center 355 (Moderator: Kaitlin Snapp [Dr. Mat Gendle)

Neuroscience Symposium

2:40 pm **Abigail B. Steinsiek & Luisa B. Cesar** (Dr. Amy Overman)
Perception As "Item" Or "Context" Changes Memory Accuracy: Implications For Medial Temporal Lobe Contributions To Older Adult Memory

Session III (2:40 pm – 4:20 pm) ...*continued...*

Melinda Hersey (Dr. Kathryn Matera)
Amyloid Beta Protein Aggregates And Oxidation Of Dna

Graham D. Cochrane (Dr. Eric Hall and Dr. Caroline Ketcham)
Effects Of Single-Nucleotide Polymorphisms In Apoe On Concussion Susceptibility, Severity, And Recovery Times In Collegiate Athletes

Dowell W. Stanley, Rachel E. Paxton, & Rebecca H. O'Krent (Dr. Mat Gendle)
Oral 5-Htp Does Not Affect Fine Motor Control

Yeager Auditorium (Moderator: Jessie Bond [Dr. Susanne Shawyer)

2:40 pm **Claire Bishop** (Prof. Jack Smith)
Costuming A Historical Musical In The Modern Age

3:00 pm **Morgan Mayer** (Prof. Jack Smith)
The Effect Of Projections On Theatrical Productions

3:20 pm **Allison Pichowicz** (Dr. Susanne Shawyer)
Bringing the Barrio to the Bubble: Using Dramaturgy to Build Actor and Audience Awareness in "In the Heights"

SURF Reception (4:30-5:30 pm) McKinnon Hall

ACCOUNTING

HIGH SCHOOL FINANCIAL LITERACY IN NORTH CAROLINA

Richard S. Segal (Dr. Paula Weller and Dr. Linda Poulson), Department of Accounting

After creating a financial literacy program targeting high school students in the local community, I wanted to learn more about financial literacy in North Carolina. I quickly found that North Carolina has taken steps to require financial literacy in public high schools across the state, but I also realized that there were some deficiencies in the program. The following research answers the question of how the financial literacy requirement in North Carolina public schools has been implemented and its overall effectiveness. Without an intentional effort to improve financial literacy in high schools across the state, students may find themselves making poor financial decisions that have life-long consequences. By researching the financial literacy requirement and searching for improvements, students can begin to make sound financial decisions early in life, setting themselves up for financial success. To conduct the research, I held a series of interviews with principals, bankers, and educators to investigate financial literacy in the state. Furthermore, I compared the North Carolina standards to those of surrounding states, such as Virginia and Georgia, to better understand the Tar Heel states curriculum. I expect the results of my research to be noteworthy. While North Carolina requires financial literacy to be covered in public high schools, the content is not required to be tested, leading teachers to skip over the material. Additionally, many teachers understand the importance of financial literacy, but fail to cover the material—wouldn't you too skip over the untested material in the curriculum in favor of tested material if a standardized test was fast approaching? As a result, I expect my research to find that in order actually require a financial literacy component in high schools, testing should also be required. My research also found that programs have been developed to help facilitate financial literacy—like the partnership between BB&T and EverFi to provide financial literacy content to every high school in the state—but not every high school has taken advantage of these resources. Hopefully, this research can shed additional light on financial literacy in North Carolina, and serve as resource to teachers across the state.

BIOLOGY

The effect of valproic acid on notch signaling in adult *Danio rerio* intestinal cell differentiation

Kasey M. Llorente (Dr. Jennifer K. Uno), Department of Biology

Inflammatory bowel disease (IBD) is a classification of chronic remittent immune disorders affecting approximately 1.4 million people in the United States between the ages of 15 and 40. It is thought to be caused by an interaction between genetic predisposition and environmental factors, an exact mechanism explaining the onset of IBD remains unclear. Recent studies indicate a reduced number of mucus secreting cells is typical in affected individuals, and that the differentiation of intestinal cell types into either absorptive or secretory is governed by a Notch signaling pathway. There remain gaps in knowledge of how this pathway is activated or inhibited in people with chronic IBD. The purpose of this study was to induce the Notch pathway in zebrafish. We hypothesize that a corollary shift in the expression of secretory versus absorptive

cell types in the gut would be observed in fish treated with valproic acid (VPA). Studies showed that VPA, a compound frequently used in the treatment of neurological disorders, activates Notch in the regulation of neuronal cells. A dosage curve was generated and the optimal concentration of VPA to administer that appeared to have an effect, without overdosing the zebrafish was determined to be 500 and 1000 µM. Following VPA treatment, brain and intestinal tissue was extracted and an RT-PCR was run. A 30% increase in the expression of the Notch receptor was observed in brain tissue indicating VPA may be activating Notch signaling ($n = 3$, $p > 0.05$). Preliminary results indicate that zebrafish are a viable model to study Notch signaling in the intestine. Future experiments will focus on western blot analysis of protein isolated from zebrafish intestines to observe any differences in the expression of Notch receptor following VPA treatment.

PESTICIDE CARBARYL REDUCES SOCIAL BEHAVIOR IN ZEBRAFISH

Jessica E. H. Brown (Dr. Linda Niedziela), Department of Biology

Autism is a developmental disorder identified through difficulties with social communication, inflexible language and behavior, and repetitive sensory-motor movements. The mechanism that causes autism is unknown, but studies have shown that autism has both genetic and environmental links. Because zebrafish exhibit social behavior through schooling, they have the unique ability of tying together social behavior and environmental variables such as pesticide exposure. Behavioral consequences in zebrafish exposed to varying levels of carbaryl, a commonly used pesticide, were studied using two schooling assays to create a behavioral model for autism. In both assays groups of five fish were exposed to four concentrations of carbaryl ranging from 0 µmol/L (control) to 2.5 µmol/L for three days prior to the assay. The first assay studied the distances between all fish in each group during a ten-minute time period in a 15-gallon tank. The second assay was similar except a novel group of fish was introduced to an established group of fish. All trials were videotaped and measurements were taken every ten seconds using Logger Pro software. For higher carbaryl concentrations, less association was expected when schooling as measured by greater distances between fish for both assays and higher association between known fish versus novel fish for the second assay. In the first assay, the distances between fish in the medium and high concentration groups (5.81 and 5.78 inches) were shown to be significantly greater than those in the low concentration and control groups (2.58 and 2.27 inches; $p<0.0001$). There was no significant difference in distance between control fish and low concentration or between medium and high concentrations. Using this behavioral model, the next step would be to study a molecular target. Since prior research has shown the expression of reelin is decreased in autistic individuals, future research will focus on reelin expression levels in each group of fish. Using data from both behavioral and molecular studies, a link could be established between altered levels of reelin and behavior. Ultimately, this could establish reelin as a definitive molecular marker for autism, which would eliminate the need for subjective behavioral analysis to diagnose autism.

ENVIRONMENTAL TOXICANTS N-NITROSODIMETHYLAMINE (NDMA) AND N-ETHYL-N-NITROSOUREA (ENU) CAUSE CHROMSOME INSTABILITY IN ZEBRAFISH (*DANIO RERIO*) REVEALING A POSSIBLE MOLECULAR MECHANISM FOR CARCINOGENESIS

Megan Sibree (Dr. Linda Niedziela), Department of Biology

Cancer is caused by changes in the genome that result in the rapid production of compromised cells. Environmental toxicants have been shown to cause these changes through a variety of mechanisms. Although these mechanisms are studied intensively in the cancer research field, the role of chromosome instability in cancer induction is not well understood. Because chromosome instability is frequently observed in cancer patients, it is essential to determine how it occurs to further understand cancer disease progression and discover more effective treatment plans. In this study, zebrafish were used as an experimental model to investigate mechanisms of cancer induction utilized by NDMA and ENU. Muscle tissue was collected via dissection and analyzed using random amplified polymorphic DNA (RAPD) analysis. This method uses DNA primers to amplify DNA at specific, random sequences that should be consistent between fish that have not been exposed to environmental toxicants. When chromosome instability is induced, alterations in the amplified DNA can be visualized using gel electrophoresis. A greater number of changes in banding pattern compared to control DNA suggests greater genomic instability. Six primer sets from the GE Healthcare Ready-To-Go™ RAPD Analysis Kit were evaluated in unexposed zebrafish and two were chosen that showed the most distinct and consistent banding patterns. Using these primer sets, initial RAPD trials were performed on fish exposed to NDMA, ENU, and appropriate controls. Preliminary results show an increase in variability of banding patterns in treated fish, suggesting that NDMA and ENU induced an increase in genomic instability. If this trend continues in further trials, these molecular changes will be confirmed at the chromosome level using fluorescent *in situ* hybridization.

GENOMICS IN THE WORLD OF ENTREPRENEURSHIP

Stephen J. Bianchi (Professor Gary Palin), Department of Entrepreneurship

The question I have conducted research upon is how has entrepreneurship acted upon the new industry of genomics? The world of consumer health information has exponentially evolved ever since the Human Genome Project in 2003. Through this project, genome sequencing services became available to the medical world. Bio-tech entrepreneurs began to tap into this new industry with ventures such as Pathway Genomics, Navigenics and deCODE genomics. In 2006, the eventual industry leader 23andMe emerged with a DNA test kit for $99. The founders were able to obtain $125 million in funding in a six year span. Through their DNA kits, the company is able to obtain essential information in genetic data that could be of interest to health agencies. However, the FDA stepped in and sued the company due to the selling of non-approval of medical devices for 5 million dollars. The FDA believed the public was not ready to have access to genomic information without medical guidance through the DNA kits. The genomics revolution will continue to lead to opportunities for entrepreneurship. I was able to conclude that there are multiple types of fields within genomics that entrepreneurs can utilize to expand how much our body can tell us.

THE IMPACTS OF ICE STORM DAMAGE TO THE STRUCTURE AND COMPOSITION OF ELON UNIVERSITY FOREST

Chloe E. Connolly (Dr. David Vandermast), Department of Biology

Extreme and infrequent natural disturbances, such as an ice storm can have profound effects on the structure and composition of a forest. The ice storm of March 6th, 2014 was an unusual precipitation event (over 1.27 cm of ice) for the central Piedmont of North Carolina. The objective of this study was to understand the effect of this ice storm on Elon University Forest

(EUF). As a relatively young forest dominated by-early successional pines, we hypothesized that this storm accelerated the successional trajectory of EUF. For this study, we used data collected in 2011 and we resampled eight 1000m^2 (20 x 50m) permanent vegetation plots established in EUF. In each plot, all trees 10 cm and greater in DBH (diameter breast height) were identified to species and measured for their diameter, in accordance with Carolina Vegetation Survey protocols. We found that 4.2% of trees and 5.3% of basal area were lost to storm-caused tree mortality. Of 27 tree species, Virginia pine (*Pinus virginiana*) was most frequently affected by this storm (of 19 fallen trees 18 (94.7%) were Virginia pine). Plots dominated by early-successional species suffered greater mortality and loss of basal area than did late-successional plots. Furthermore, blocked-MRPP (Multi-response Permutation Procedure) and ordination using NMS (non-metric multidimensional scaling) in PC-ORD indicated that, by selectively removing pines, this event altered early-successional plots more than it did late-successional hardwood-dominated ones. Our data support our hypothesis that the ice storm hastened the loss of early-successional species and accelerated the pace of secondary succession on EUF.

FREQUENCY OF MOLECULAR MECHANISMS OF INSECTICIDE RESISTANCE IN MYZUS PERSICAE

Lauren C. Corbin (Dr. Greg Haenel), Department of Biology

The green revolution has drastically increased insecticide usage in the commercial crop production sector. Insects have evolved specific mechanisms in order to combat this. We examined two enzymes, both of which not only confer resistance in a mutated form, but also have experienced a gene duplication event producing two similar loci. The first target enzyme is acetylcholinesterase, coded by *ace-1* and *ace-2* genes. When mutated at the ace-1 locus, resistance to pirimicarb results. The second enzyme target is the GABA receptor subunit encoded for by the *rdl* gene. When the M2 region of this gene is mutated, resistance to cyclodiene insecticide endosulfan is conferred. This study examines the evolutionary changes of these two genes in green peach aphid, Myzus persicae, populations that are currently living on tobacco and not being sprayed with insecticides. It was predicted that aphids will lose mechanisms of insecticide resistance when not exposed to insecticides because of an absence of selective pressures and a high fitness cost associated with insecticide resistance. In this study, four populations of green peach aphids that live on tobacco from NCSU research stations in eastern NC were screened for mutations in the *ace-1* and *rdl* loci using PCR-RFLP and direct DNA sequencing respectively. Fields had not been sprayed with insecticides in recent history. It was found that all aphids were heterozygous at the ace-1 locus for resistance and susceptibility; however, all aphids were wildtype at the *rdl* locus. This finding is significant because even though the selective pressures are relieved, the resistant allele at the *ace-1* locus is still present in all aphids sampled. The lack of genetic diversity at these loci is possibly due to a high rate of asexual reproduction, a fitness cost associated with the duplicated loci, or genetic bottleneck when aphids moved onto tobacco. In addition, the gene duplication event in the *ace-1* gene could allow for less of a fitness cost associated with having a resistant allele at one of the loci because the wild type version of the enzyme is still present.

POPULATION STRUCTURE OF THE SCALLOPED HAMMERHEAD (*SPHYRNA LEWINI)* AND CAROLINA HAMMERHEAD (*SPHYRNA GILBERTI)* IN NORTH CAROLINA COASTAL WATERS.

Nicholas A. de Castro (Dr. Michael Kingston), Department of Biology

In order to better discern the genetic population structure of the scalloped hammerhead *Sphyrna lewini* and determine the northern-most range of the morphologically similar species *Sphyrna gilberti* (the Carolina hammerhead) hammerhead sharks were sampled from Onslow Bay, North Carolina between July and November of 2013. Individuals were captured by long line fishing techniques from locations at GPS coordinates 34° 38' N 76° 37' W, and 34° 32' N 76° 37' W, and fin clipping samples were taken for DNA extraction. Five hammerheads were sampled: four initially identified as *S. lewini* and one as *S. mokarran* (the great hammerhead) based on external morphology. DNA sequence analysis of the mitochondrial control region, a sequence commonly used for species identification, was carried out by polymerase chain reaction (PCR) using the primers 5'-TTGGCTCCCAAAGCCAARATTCTG- 3', 5' - CCCTCGTTTTWGGGGTTTTTCGAG – 3'. PCR products were sequenced using an Applied Biosystems 3730xl DNA Analyzer and analyzed using Codoncode Aligner® software. Genetic analysis revealed that several of the original species identifications based on morphology were incorrect. Two of the sharks were identified as *S. lewini* and had haplotypes belonging to the most common Atlantic DNA sequence (Genbank Acc no DQ438149.1), while the other three sharks were identified as the Carolina hammerhead *S. gilberti.* This report represents a range extension for the Carolina Hammerhead shark which was captured further north than previously reported in the literature.

OIL DISPERSANT DISRUPTS *ZATP 1A.1A.1* ATPASE EXPRESSION WITHIN THE SKIN AND GILLS OF ZEBRAFISH

Timothy M. Demers (Dr. Linda Niedziela), Department of Biology

Currently approved oil dispersants, which are used in oil spill clean up attempts, are deemed safe due to low mortality of aquatic life. However, sublethal doses can impair key cellular processes that affect an animal's long-term survival. ATPase enzymes are essential in maintaining ion concentrations within the cells. However, dispersants can disrupt ATPase function causing osmotic imbalances in skin and gill cells. These imbalances can lead to cell lysis or cell shriveling. The current study expands upon previous research in our lab in order to better understand the alteration of ATPase expression seen in quantitative PCR (qPCR) analysis. Adult zebrafish (*Danio rerio*) were exposed to six concentrations of Dispersit™ ranging from 0.05 to 1 ppm for 24 and 48 hr. Gill and skin samples were collected and mRNA converted into cDNA before qPCR of ATPase isoform *zatp 1a.1a.1* was performed. At low concentrations, an initial increase in ATPase expression was observed. As the concentration increased beyond low levels, ATPase expression rapidly decreased. The initial increase is thought to result from pressure on the zebrafish to increase ATPase production, in order to cope with impairment by oil dispersants. However, at high doses cells may no longer be able to compensate and production of ATPase decreases. These results contribute to our understanding of how oil dispersants negatively impact the survivability of aquatic life by being used in attempted oil spill clean up.

EXAMININING THE EFFECTS OF PI3K INHIBITOR PX-866 ON PI3K SIGNALING IN T CELLS

Margaret E. DeMonia (Dr. Yuko J. Miyamoto), Department of Biology

Phosphatidylinositol 3 kinases (PI3Ks) are lipid kinases in the PI3K/Akt/mTOR cell signaling pathway. The PI3K pathway is important for cell motility and adhesion and overexpression of this pathway is found in certain cancer types. Inhibitors that block the pathway are being studied

to develop cancer drugs. Most known PI3K inhibitors, such as the inhibitor wortmannin, are unstable and toxic, and cannot be used clinically. However, a derivative of wortmannin, PX-866, has been found to be more stable and causes less damage to normal cells. This molecule is able to inhibit the proliferation and motility of cancer cells and is being studied in clinical trials. While the effects of PX-866 on adherent cancer cells indicate that the compound might behave as a potent cancer treatment with limited harm to normal cells, no studies have been performed to determine the effect the inhibitor has on other cell types. This project examined if PX-866 affected non-adherent acute lymphocytic leukemia cells in a similar manner to adherent cells. The PI3K pathway plays an important role in the immune system, and has been linked to immune cell production and activation. This pathway is essential to the proper function of T cells. The effect of PX-866 on PI3K signaling in Jurkat cells was examined through western blot analysis. When treated 100 nM of inhibitors, Jurkat cells displayed decreased levels in phosphorylated Akt, suggesting that both PX-866 and wortmannin have similar effects on PI3K signaling in T cells as they do in adherant cells. However, no significant changes in levels of pAkt were detected (p value >0.05) when cells were treated at concentrations between 0.01 nM and 10 nM, in comparison to the control. This suggests that the amount of inhibitor being studied in treating adherent cancer cells may not adversely affect PI3K signaling in Jurkat cells. Further research under conditions in which levels of pAkt are elevated may provide greater insight into the effectiveness of the drug.

EXPLORING THE NEXT GENERATION OF GENOME SEQUENCING

Paloma A. Jenkins (Dr. Terribilini), Department of Biology

The field of genomics has seen an exponential growth due to the acceleration of DNA sequencing technology. The purpose of this project is to explore genomics technology and the impact it will have on health care. A brief history of three different DNA sequencing "generations" will be given to demonstrate the dramatic increases in speed and associated decreases in cost. Currently, companies like 23andme provide direct-to-consumer genotyping services for under $100. Inexpensive genotyping like this facilitates the possibility of personalized health care. Sequencing techniques have already impacted healthcare by giving scientists the possibility to identify cells specific to a single tumor, thus making it possible to provide a more selective and unique treatment on the patient based on the DNA of the tumor. The expansion of genomic technologies has also given rise to a new medical specialization, the "genetic counselor", which acts as a liaison between the genomic science and patients. "Next Generation" genotyping technologies have the potential to dramatically accelerate biological and biomedical research by making genome analysis even faster, more inexpensive, and accessible worldwide.

COMPUTATIONAL ANALYSIS OF AGGREGATION OF FUS AND TDP-43 PROTEINS INVOLVED IN AMYOTROPHIC LATERAL SCLEROSIS (ALS)

Rosemary H. Kelley (Dr. Michael Terribilini), Department of Biology

Amyotrophic lateral sclerosis (ALS) is a progressive neurodegenerative disease that affects the nerve cells in the brain and spinal cord causing patients to lose the ability of the brain to initiate or control muscle movement. ALS, also commonly referred to as Lou Gehrig's Disease, causes muscles to atrophy due to lack of movement and ultimately results in fatal paralysis. Recent research in the pathology and genetics of ALS has revealed that there are two distinct RNA-

binding proteins, TDP-43 and FUS, involved in ALS. This has led to the implication that abnormal RNA metabolism is a key event leading to neurodegeneration. These RNA-binding proteins are unique due to the presence of prion-like domains. Prions are self-templating protein conformers that promote phenotypic change and are naturally transmitted between individuals. A prion-like domain, however, is a distinctive region of the protein enriched in asparagine, glutamine, tyrosine and glycine residues. However, while it is clear that both of these proteins play a role in ALS, the mechanisms by which each protein contributes to neurodegeneration are not clear. Using software, we generated structural models of individual FUS and TDP-43 proteins as well as several potential paired conformations. We then used molecular dynamic simulations to evaluate the molecular stability of these modeled shapes. This analysis allows us to compare certain aspects of the different paired conformations, such as the final locations of the prion-like domains and RNA-binding domains within the pair, ultimately revealing specific mechanisms by which FUS and TDP-43 may aggregate. In the future, computational modeling can describe the possible time course of aggregate formation – ultimately providing a causal link between aggregate formation and onset of disease.

THE EVOLUTION OF VOCAL MIMICRY IN THE NORTHERN MOCKINGBIRD

Richard P. Lyon (Dr. David Gammon), Department of Biology

Male northern mockingbirds (*Mimus polyglottos*) are famous for their ability to mimic the sounds of other species, but they also communicate with non-mimetic song. An analysis of the evolutionary tree for mockingbirds suggests that mimetic singing evolved from non-mimetic song. As a first step toward understanding how and why vocal mimicry evolved, I sampled spontaneous song from free-living male mockingbirds during the breeding season, and isolated mimetic and non-mimetic songs from each male. Using bioacoustic software, I then measured 13 acoustic features for each of 260 total songs. I compared acoustic features between mimetic and non-mimetic song using multivariate statistical tests. I found that mimetic songs contained a broader range of frequencies than did non-mimetic songs. This result suggests the possibility that natural selection for a broader range of frequencies contributed to the evolution of vocal mimicry. Similar studies comparing the acoustic features of mimetic vs. non-mimetic song are needed for other vocal mimics to assess whether my results suggest a more general evolutionary trend.

RECEIVING A PERSONALIZED GENOME ANALYSIS- A FIRST HAND ACCOUNT

Briana E. Pfeuffer (Dr. Gammon), Department of Biology

Personalized genomics used to be a possibility only for the elite few, but recent technological advances are causing dramatic price decreases, thus making personalized genomics available to virtually everyone. A major consequence will be dramatically increased access to personalized information about health risks, genetic predispositions, and ancestral information. To investigate what the future holds for everyday non-scientific persons, I had my own genome analyzed through a spit sample analysis submitted to 23andme.com. Using an autoethnographic approach, I documented in a journal my experiences and conversations over the course of several weeks, and I also analyzed my genomic data using software at 23andme.com (ancestry) and promethease.com (health). Using qualitative research methods I coded my journal data, and 16 themes emerged. The most notable themes were emotional nervousness, and my frustration with

how to navigate this thriving, yet complicated, scientific field. Ultimately, my results led me to conclude there is a significant need for more genomic interpretation and counseling as a way to bridge the gap between the scientific and everyday world, and that genomics certainly have potential to revolutionize society.

EXPRESSION OF ATPASE GENE ZATP 1A.1A.5 IN *DANIO RERIO* GILL AND SKIN IS ALTERED BY EXPOSURE TO OIL DISPERSANT

Thomas M Shoemaker (Dr. Niedziela), Department of Biology

Oceanic application of large volumes of oil dispersants in response to oil spill accidents is potentially harmful to the marine environment. Using *D. rerio* as a model organism, previous research in our lab established that gene expression of Na^+/K^+ ATPases (enzymes used to maintain salt balance in cells) are affected by the presence of oil dispersants. In order to better understand and quantify the dose response of oil dispersants on isoform zatp 1a.1a.5, *D. rerio* were exposed to six concentrations of Dispersit™ ranging from 0.05 to 1.0 ppm for 24 hours. After harvesting gill and skin tissue samples and converting messenger ribonucleic acids (mRNA), to complimentary DNA, quantitative real-time PCR was performed in order to compare the amount of mRNA present in each treatment to the solvent control. A significant difference between the control and experimental groups was found when analyzing the data with two-way ANOVA, supporting a concentration dependent effect. The shape of the response is similar between gill and skin but the strength of the response differs. These results help determine the toxicological effects of oil dispersants commonly used to clean up oil spills, and hopefully aid in the development of a non-toxic alternative.

EVALUATION OF MORINGA OLEIFERA AS A RECOVERY METHOD FOR MALNUTRITION

Emily R. Tomich (Dr. Matthew Clark), Department of Biology

Moringa Oleifera, a widely cultivated species of tree in India, is an exceptionally nutritious vegetable with a variety of potential pharmaceutical and therapeutic treatments. Currently, research is being done about how it can be used as an intervention for severe acute malnutrition. In this present study, we investigated the hepatoprotectiveness of Moringa Oleifera leaf extract through measuring liver lactate dehydrogenase (LDH), an enzyme that is a sign of tissue damage and disease. Low LDH levels indicates the protective and recovery potential of Moringa Oleifera from the detrimental effects of malnutrition, specifically liver damage. Malnutrition was induced in 20 frogs through a less frequent feeding of crickets while 4 frogs served as the true control group and did not undergo malnourishment. After a 30-day starvation period, 10 frogs were fed crickets supplemented with 50 microliters of Moringa Oleifera leaf extract while the remaining 10 frogs were fed only crickets and did not receive the supplement. All frogs were sacrificed humanely using a tricaine methansulfonate solution at the end of the experiment and their weight and livers were collected and assayed. A lactate dehydrogenase (LDH) cytotoxicity liver assay kit was used to determine tissue damage evident from malnourishment. Using the LDH cytotoxicity assay kit, the preliminary results show that frogs receiving the Moringa Oleifera after being in a malnourished state had lower LDH levels than those that did not receive the Moringa Oleifera supplement. The data suggests that LDH levels in frogs receiving Moringa Oleifera was also lower than the frogs that did *not* undergo malnourishment. Results suggest that

Moringa Oleifera had a protective and possible reversal effect on liver tissue damage evident from malnourishment.

THE EFFECT OF OBESOGENS ON THE MICROBIOTA AND SYSTEMIC HEALTH IN ZEBRAFISH

Kaylyn D Tousignant (Dr. Jennifer Uno), Department of Biology

The global obesity and diabetes epidemics are responsible for increasing medical costs and contribute to a number of dangerous health problems affecting millions of people. There is growing evidence that environmental toxins, known as obesogens, contribute to their development. Obesogens cover a broad range of chemicals that are known to lead to increased fat accumulation and obesity. The ability these toxins have to alter metabolism and fat storage make them a crucial piece in understanding their contribution to obesity. The gut microbiome are involved in several processes within our bodies, including metabolism. The aim of this study is to examine the link between Atrazine, a common pesticide used in the US and known obesogen, and the gut microbiota. We expected Atrazine exposure to increase the presence of both *Firmicutes* and *Bifidobacterium*, as well decrease the presence of *Bacteroidetes.* Zebrafish were exposed to 0.25 ng/L and 0.50 ng/L of Atrazine for two weeks. Treated fish had significant weight gain throughout the course of treatment, with final weights more than doubling that of control weights ($n= 8$, $p > 0.02$). Following exposure weight bacterial DNA was isolated and analyzed using real time PCR. Results indicate a decrease in *Bacteroidetes* and in *Firmicutes* indicating an overall decrease in gut bacterial diversity in treated fish relative to control fish. Understanding how the gut ecology and environmental chemicals are linked to obesity and diabetes may provide valuable insight to improving this dangerous global epidemic.

GUARDIAN OF THE GENOME: COMPUTATIONAL MODELING OF P53 INTERACTIONS WITH S100B

Sarah M. Vaughan (Dr. Michael Terribilini), Department of Biology

The tumor suppressor gene TP53, which codes for the p53 protein, is one of the most important suppressor genes involved in cancer. The p53 protein is mutated in one half of all human cancers, making it an important target for cancer research. p53 has over 80 protein binding partners and while some of these interactions are well studied and understood, others are not and require further understanding. One such binding partner, S100B, binds to p53 and prevents it from folding correctly to form a functional protein. The fact that S100B prevents p53 protein folding is indicative that inhibitors could be useful in reinstating normal p53 function to reduce tumor growth. However, the mechanism by which S100B and p53 bind is not known. This research aims to understand the mechanism by which p53 and S100B interact and how S100B prevents p53 from forming its final structure. Furthering an understanding of the interaction between S100B and p53 will help design medicinal compounds for better direct treatment in cancers that the p53-S100B interaction is causing significant problems. Computational modeling software, AMBER, is being used to model the proteins and their interactions. S100B, which requires calcium for its interaction with p53, was modeled individually with and without calcium to determine any differences in behavior. The p53 protein was also modeled individually; the data from these simulations serves as a baseline comparison of behavior in future simulations. While the two proteins are stable when independent, the individual proteins as well as their behavior and stability will be compared to the interaction between S100B and p53. Modeling the

interaction between p53 and S100B will give insight into the mechanism of the interaction between the two proteins.

DIFFERENTIAL HEAT RESISTANCE OF FUNGAL ISOLATES COLLECTED FROM ELON UNIVERSITY FOREST

Patrick J. Wheeler and Meghan Clark (Dr. Antonio D. Izzo), Department of Biology

Understanding the impact of fungal spore heat resistance during ecological perturbations such as fire is important in predicting the future outcome of species composition in ecosystems. Historically, forest fires have impacted forest structure and succession in all of the United States including the Piedmont region of North Carolina. Previous studies from our lab identified two fungi - *Penicillium ademetzii* and *Umbelopsis ramanniana* - from Elon Forest (Elon, NC) that appeared to exhibit resistance to heat as measured by dry heat treatment and culture-based analysis of spore viability. For the current study the same two original isolates were reanalyzed along with four new isolates from the same forest. This study expanded on the earlier study by using wet heat treatments that were measured across a wider range of temperatures and that were coupled with an approach of viability staining and fluorescent microscopy. The goal of the study was to test for the potential of differential heat resistance of spores across species in this forest. *P. ademetzii* and *U. ramanniana* showed significantly lower viability with the wet heat treatment compared to the earlier study however each had spores that survived temperatures in the 60-70℃ range. While all showed a similar trend of reduced spore viability with increasing heat, significant resistance differences were seen between the fungal species. Of particular note, isolate PW2 exhibited heat resistance even higher than those of the prior study. These results imply that differences in heat resistance in spores could affect initial fungal species composition and colonization following a fire disturbance. Because fungi are known to impact plant health and development, as well as other forest processes, any fungal community compositional changes could have further implications for larger forest community dynamics.

CHEMISTRY

MULTIFUNCTIONAL POLYURETHANE HYDROGELS FOR BIOMEDICAL APPLICATIONS

Christian G. Seitz (Prof. Dr. Alexander Böker), DWI – Leibniz-Institut für Interaktive Materialien, Lehrstuhl für Makromolekulare Materialien und Oberflächen, RWTH Aachen University

Polyurethanes represent a broad class of polymers widely applied in everyday-life. Although polyurethanes are easy to produce and have a broad range of adjustable properties, only a few polyurethane-based nanomaterials have been realized so far. Here we designed a novel class of water-soluble polyurethanes that combine multiple functionalities relevant for biomedical nano-applications. Their chemical and mechanical properties can change, triggered by both changes in pH inside the body and intracellular redox reactions. Cross-linking water-soluble polyurethanes leads to hydrogels, which are materials with soft mechanical properties useful for applications like drug delivery or tissue engineering. However, previously reported methods to create

polyurethane-based hydrogels are limited for biomedical use, since they are based on toxic prepolymers. Our novel gelation mechanism is based on physical interactions and does not require any toxic prepolymers, rendering our hydrogels non-toxic and applicable as drug delivery systems or injectable gels for in-situ tissue engineering.

LIPID ANCHOR ORGANIZATION WITHIN CELL MEMBRANES

Samantha A Coffer (Dr. Sara Triffo), Department of Chemistry

The cell membrane is an important cellular organelle that encapsulates the cell's contents and acts as a barrier to protect the cell from its surroundings. Cell membranes are made up of a phospholipid bilayer, which include fatty acids, proteins, sterol regions, and surface markers such as carbohydrates. Cell membrane organization plays a wide role in many cellular functions, such as determining what substances are able to enter and leave the cell, therefore it is advantageous to understand why components of cell membranes arrange themselves in specific manners. Lipid-anchored proteins are one component of cell membranes that are composed of a peripheral protein attached to a fatty acid that is embedded within the phospholipid bilayer. Lipid-anchored proteins are arranged in a variety of ways; however, it is unknown what causes their specific arrangement. The aim of this research is to determine if the lipid anchored protein plays a role in its own organization and if so, how does each component, protein and fatty acid, play a role in doing so. In order to understand this phenomenon, the strain of yeast, *S. pombe,* will be used as a model organism to monitor arrangement of different lipid anchors in relation to sterol enriched regions within the cellular membrane. *S. pombe* was chosen as the model organism because they naturally have large, observable sterol-enriched domains, which will allow us to observe how sterols within the membrane affect lipid-anchored protein organization. Sterol regions are of importance in this investigation because previous research has demonstrated that they play a role in cell membrane organization. Data is collected through fluorescence microscopy. A method involving the use of agar pads has been refined for the purpose of imaging live yeast. Also a method to stain sterol regions of live yeast using filipin dye has been practiced. Thus far, there has been one successful transformation of the lipid-anchored protein, acylated GFP, to *S. pombe.* Preliminary data was collected however this protocol needs to be refined in order to obtain clearer data. Ultimately a library of many lipid anchors will be built in order to better understand cell membrane organization.

UNDERSTANDING THE APOPTOTIC POTENTIAL OF HEART CELLS

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Of all of the organs in the human body, the heart is one of the most vital. Should the heart or the blood vessels around the heart fail to develop properly, congenital heart defect occurs. Apoptosis, or programmed cell death, is a highly controlled and regulated process known to occur throughout embryogenesis and is critical in heart development. However, very little is known about the specific apoptotic changes that occur during development. Therefore, our research investigates the molecular mechanisms of cell death in heart development. We hypothesize that heart cells isolated from a newly developing heart have greater apoptotic potential than heart cells of a fully developed heart. Cardiomyocytes and cardiac fibroblasts were isolated from whole hearts harvested from chick embryos at different times during development. The cells were then treated with various concentrations of hydrogen peroxide to induce cell death and then stained with Annexin-V-FITC to visualize apoptotic markers via flow cytometry. The

amount of apoptosis induced was then used as a measure of susceptibility to apoptosis. Our data indicate that the amount of apoptosis induced by hydrogen peroxide treatment is no different for either cardiomyocytes or cardiac fibroblasts isolated from the same developmental stage. However, cell death for both types of cells at embryonic developmental day 5 (E5), when heart development is occurring, is significantly greater as compared to cells at embryonic developmental day 10 (E10), once heart development is complete. These results indicate that once heart development is done, both cardiomyocytes and fibroblasts develop resistance to apoptosis. This is critical, as it is important for heart cells to be susceptible to apoptotic signals throughout development so that proper structural formation can occur, but also necessary for resistance to apoptosis once formative events have occurred.

DETERMINING THE MECHANISM OF OXIDATION OF [Symbol]-ESTRADIOL BY LACTOPEROXIDASE

Taylor A. Glenn (Dr. Kathryn Matera), Department of Chemistry

Estrogenic hormones, when oxidized, are known to present carcinogenic risk for humans. Free radical derivatives of estrogenic hormones, created through enzymatic oxidation reactions, may cause mutations of DNA. β-Estradiol, in particular, is susceptible to oxidative changes by the enzyme lactoperoxidase (LPO). LPO is produced in the mammary glands, suggesting that this oxidation could be implicated in breast cancer. Therefore, this research looks to understand the mechanism by which β-estradiol is oxidized, to help understand how such oxidation could be prevented. Model studies of oxidation were performed with the hormone β-estradiol and known oxidizing agents, either hydrogen peroxide (H_2O_2), copper (II) salts, or a mixture of the two. Each oxidation reaction was monitored spectroscopically in order to quantify the oxidative change. The estradiol product from each model system was analyzed through NMR in order to identify the molecular structure of each. With these model studies complete, the reaction between β-estradiol and lactoperoxidase (LPO) was run. The oxidized product was analyzed the same way, comparing the results to each model system. Similarities in product structure from LPO-oxidation would suggest similarities in known reaction mechanisms.

AMYLOID BETA PROTEIN AGGREGATES AND OXIDATION OF DNA

Melinda Hersey (Dr. Kathryn Matera), Department of Chemistry

Alzheimer's disease is a common neurodegenerative disease associated with the aggregation of the protein amyloid beta in the forebrain, which results in damage to the cholinergic neurons. The formation of these aggregates results in oxidative processes, including the oxidation of DNA, leading to DNA mutations. In order to look at the effect of aggregates on DNA and how this oxidative process can possibly be halted, a common indicator of DNA oxidation, 8-hydroxyguanine, was analyzed. Increased production of 8-hydroxyguanine, and therefore increased levels of DNA oxidation in the presence of amyloid beta aggregates, suggests that 8-hydroxyguanine is the target in the oxidation of DNA found in Alzheimer's disease. Initial results from HPLC and NMR analyses indicated that guanine is oxidized into multiple products in the presence of aggregated amyloid beta. Identifying the actual products formed from the reaction with aggregated amyloid beta will help outline a potential mechanistic pathway of DNA oxidation, which in turn may contribute to the current research towards a cure for Alzheimer's and other amyloid diseases.

INVESTIGATION OF THE CELLULAR MECHANISM OF APOPTOSIS IN RENAL FAILURE DURING SEPSIS

Thomas J Lampl (Dr. Victoria Moore), Department of Chemistry

Sepsis, a disease characterized as a severe inflammatory response to infection , affects 750,000 people per year. Patients exhibit highly increased concentrations of cytokines, or chemical messengers, believed to be linked to end-organ failure caused in part by apoptosis, or programmed cell death. This study aims to determine the cellular mechanism of apoptosis during sepsis using an in vitro model of sepsis-induced acute kidney injury (AKI). By understanding the biochemical mechanisms, future research into therapeutic targets becomes possible. Cultured kidney cells were treated with either cytokines secreted from THP1 cells exposed to lipopolysaccharide (LPS) or recombinant cytokines in order to induce apoptosis. Then, MTT assays, a standard test used to analyze cell viability, were used after 24- and 48-hour treatments. Furthermore, flow cytometry of whole cells stained with Annexin-V-FITC determined the amount of apoptosis-specific cell death incurred through fluorescence analysis. Our results show a small, yet significant, decrease in cell viability for cultured cells treated with recombinant cytokines versus untreated cells which provides evidence that we have created a strong sepsis model. Correlated flow cytometry results indicate that the majority of the cell death occurring is in fact due to apoptosis. Additionally, Western blotting, immunoprecipitation, and BH3 profiling assays were conducted to determine which BCL-2 family proteins may be important players involved with cytokine-mediated apoptosis. Data from these analyses suggest anti-apoptotic BCL-2 protein and pro-apoptotic BIM protein are key contributors in the apoptotic pathway. Further experiments are currently underway using primary kidney cells, and eventually the in vivo model that uses a mouse model of sepsis can be employed in future research to give additional insight into AKI that results from sepsis.

WHY IS SUFURIC ACID A MUCH STRONGER ACID THAN ETHANOL?

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Sulfuric acid is one of the world's most important chemicals, largely due to its characteristics as a very strong acid. The goal of this research was to investigate the properties responsible for its highly acidic nature in the gas state. Specifically, inductive/field effects and electron-delocalization effects are known to contribute to the strength of sulfuric acid. The goal of this research was to determine the contribution by each effect. To do so, a computational method was used that employs a quantum theoretical software program, Gaussian 09, to determine the energies associated with molecular conformations. Using this program, the acidities of ethanol and sulfuric acid were calculated, along with the acidities of related compounds in which carbon chains were strategically inserted. From the dependence of the relative acid strengths on the length of the carbon chain, it was determined that both inductive/field effects and electron-delocalization effects have significant contributions, but inductive/field effects contribute more. These results were supported by a second computational study performed at the University of Western Michigan, in which a complimentary method was used to calculate the contributions of inductive/field effects and electron-delocalization effects. The results of this study serve to advance a fundamental understanding of the contributing factors associated with gas-phase acidity.

INVESTIGATING THE EFFECTS OF CELL MEMBRANE ORGANIZATION ON THE LOCALIZATION AND INTERACTIONS OF LIPID-ANCHORED FLUORESCENT PROTEINS IN A MODEL MEMBRANE

Kate E. Rasmussen (Dr. Sara B. Triffo), Department of Chemistry

Cell membranes are the organized lipid bilayers that envelop cells. These complex membranes contain an assortment of biological molecules and are essential for cell life and function. Lipid-anchored proteins are a class of membrane-associated proteins that play important roles in cell growth, survival, and signaling. These proteins interact with the cell membrane via attached lipid tails. The mechanism by which the organization of the cell membrane affects these interactions is not yet entirely understood. Thus, this study seeks to investigate the effects of the composition of the cell membrane on the localization and interactions of lipid-anchored proteins. Since the membranes of living cells are highly complex, purified lipid-anchored proteins can be more practically studied in a model membrane. Model membranes are simplified, controllable artificial lipid bilayers that are useful for investigating the ways in which membrane-associated proteins and other molecules interact with the cell membrane. This study utilizes myristoylated c-Src, a lipid-anchored protein involved in cell signaling pathways critical to cell growth and survival. In order to obtain purified c-Src protein bound to a myristoyl anchor, a dual expression plasmid encoding the fluorescently tagged protein of interest alongside the enzyme used to attach the lipid anchor to the protein is expressed in competent *E. coli* cells. After enzymatically attaching the lipid tail to the protein, the myristoylated c-Src is purified and analyzed. During this research experience, two model membrane systems have been established, namely giant unilamellar vesicles (GUVs) and supported lipid bilayers. After purification, the lipid-anchored protein may be introduced to GUVs or a supported lipid bilayer where its interactions and localization may be studied using fluorescence microscopy. An understanding of the role of lipid-anchors on protein activities and interactions may be beneficial for future research on human health and disease, including treatments for cancers, cellular signaling flaws, and viral infections.

MEASUREMENT OF THE EFFICIENCY OF RUTHENIUM AND OSMIUM COMPOUNDS TOWARD THE CATALYTIC SYNTHESIS OF BENZIMIDAZOLE

Alyssa K. Romano (Dr. Karl D. Sienerth), Department of Chemistry

Chemical reactions that involve e edied he catalysts require less energy and/or generate more product than uncatalyzed reactions. The aim of this research is to convert basic carbon compounds into benzimidazole more efficiently using catalysts. Benzimidazole is an increasingly important component in many medicines including anti-hypertensives and HIV-inhibitors. In recent literature investigating organometallic catalysts, which are organic compounds connected to a metal center, a ruthenium-centered (Ru-centered) compound was found to significantly catalyze the reaction of formaldehyde and diaminobenzene to form benzimidazole. Our research investigates additional Ru-centered organometallic complexes as potential catalysts for the same reaction. The first part of this multiple year project was the synthesis of three ruthenium complexes $[Ru(tptz)_2]^{2+}$, $Ru(DMSO)_4$ and $Ru(dpk)Cl_3$. However, further purification of these compounds is necessary. Also, the efficiency of $[Ru(bpy)_3]^{2+}$, a known photocatalyst for benzimidazole, was measured to set parameters such as wavelength of light and duration of photocatalysis. The newly synthesized catalysts ($[Ru(tptz)_2]^{2+}$ and $Ru(dpk)Cl_3$ will be tested to see if they will serve as catalysts in the benzimidazole reaction, and

their efficiencies as catalysts will be compared to the efficiency of the known catalyst, $[Ru(bpy)_3]^{2+}$.

THE OXIDATIVE MECHANISM OF DOCOSAHEXAENOIC ACID: THE RELATIONSHIP TO ATTENTION DEFICIT HYPERACTIVITY DISORDER

Rebecca M. Schneider (Dr. Kathryn Matera), Department of Chemistry

The pathophysiology of attention deficit hyperactivity disorder can be described by abnormalities in blood samples, including decreased levels of the lipid docosahexaenoic acid (DHA), increased xanthine oxidase (XO) enzymatic activity, and increased levels of the small molecule, malondialdehyde (MDA). This research focuses on the likelihood of a mechanism involving the oxidation of DHA catalyzed by XO, which may include MDA as a product. The rate of oxidation of the lipid was observed by monitoring the increase in absorbance in the ultraviolet region with an ultraviolet-visible (UV-Vis) spectrophotometer. The increase in absorbance indicates rearrangements of double bonds within the lipid, a hallmark of lipid oxidation. When XO was present in solution, changes in absorbances in the ultraviolet region showed the lipid was undergoing structural alterations, suggesting that XO oxidizes DHA. This finding is supported by nuclear magnetic resonance spectroscopic analysis of the lipid before and after reaction with XO.

WHY DOES THE ACETALDEHYDE ENOLATE FAVOR REACTION AT THE OXYGEN ATOM DURING GAS-PHASE NUCLEOPHILIC SUBSTITUTION? CONTRIBUTIONS BY RESONANCE AND INDUCTIVE EFFECTS

Christian G. Seitz (Dr. Joel M. Karty), Department of Chemistry

Enolate anions are important reactive components found in organic synthesis, and they can undergo reaction at the oxygen atom or the carbon joined to that atom, called the alpha carbon. In solution, the carbon atom is usually the preferred reaction site, but in the gas phase (i.e., without solvent present), the oxygen atom is preferred. To better understand this preference in the gas phase, we carried out a computational study with the quantum theoretical software program Gaussian while using the vinylogue extrapolation method on a model reaction between the acetaldehyde enolate anion and methyl fluoride. Specifically, this method was used to quantify the contributions by resonance effects (from the sharing of the negative charge) and inductive effects (from the overall negative charge) toward the activation energy of the reaction for each reaction site. Our results suggest that, for both sites of reaction, the loss of resonance from the enolate anion upon entering the transition state is more important than the loss of inductive effects. Even though this loss of resonance serves to disfavor the reaction at both carbon and oxygen, the reaction at carbon is disfavored significantly more than it is at oxygen.

CHARACTERIZATION AND IDENTIFICATION OF FLAVONOIDS IN POPLAR HONEY

Madeline C. Wise, Lindsey M. Christman, & Valeria Rizzi (Dr. E. B. Grimley), Department of Chemistry

Honey is known for its high prophylactic medicinal-value, which is largely due to phenolic compounds called flavonoids, a minor component of a food largely composed of sugars.

Flavonoids identified in many of the 450 types of honey worldwide are known to have physiologically antibiotic or anti oxidizing effects. Yet, no analysis of the flavonoids in poplar honey, which is native to the Northeastern part of the United States, has been reported. The objective of this research is to separate, identify, and correlate the flavonoids present in poplar honey, as well as analyze the oxidative properties in formerly identified flavonoids. The presence of six flavonoids; quercetin, luteolin, kaempferol, apigenin, chrysin, and galangin, have been indicated based on ultraviolet-visible (UV-Vis) spectroscopy data and retention times obtained using reverse-phase high performance liquid chromatography (RP-HPLC). Silylation coupled with gas chromatography-mass spectrometry (GC-MS) will provide the critical mass data needed to verify the flavonoid structures. Silylation of flavonoids entails the substitution of hydroxyl hydrogen atoms of the multiple hydroxyl (-OH) groups by trimethylsilyl groups, forming a silicon heteroatom bond that will protect parent flavonoid compounds from thermal degradation during the high temperature of the gas chromatograph. Once the six previously identified flavonoids have been silylated, RP-HPLC and GC-MS will be used to confirm the identity of the flavonoidic compounds present in poplar honey. In addition to these identification methods, oxidative properties of flavonoids in poplar honey have also been analyzed. UV-Vis spectroscopy indicates minor to no short-term oxidative sensitivity of flavonoids quercetin and chrysin in methanol solution when exposed to oxygen. While long-term oxidation of flavonoids still occurs, the short-term stability is valuable information in regards to the proper storage and usage of these compounds. This research is important in that it will continue to add to the existing body of knowledge on flavonoids, and will permit future research into the identity and properties of poplar and other types of honey.

THE FIGHT AGAINST ALZHEIMER'S DISEASE: COMBATTING Aβ AGGREGATES SYNTHESIZED ON LATEX BEADS

Sarah C Woidill (Dr. Matera), Department of Chemistry

Alzheimer's disease (AD) is a neurodegenerative disease that causes dementia, memory loss, and cognitive dysfunction and does not yet have a cure. Aggregation of protein segments, called peptides, of amyloid beta (Aβ) have been found to play a central role in the development of Alzheimer's disease, and often AD is diagnosed by the presence of insoluble Aβ fibril plaques in the brain. While the fibril plaques of Aβ are indicators of AD, the smaller aggregates of protein, called oligomers, have been shown to cause the serious cognitive dysfunction. This research uses a novel method to assess peptide aggregates by covalently attaching Aβ peptides on latex beads and non-covalently aggregating additional peptide strands onto the covalently bonded strands. The effects of various phenolic compounds, which are potential AD drug candidates, on the aggregation and disaggregation of peptide strands aggregated onto the beads were tested. Three different methods were used to assess the disaggregation of the peptide oligomers after adding each phenolic compound: UV-Vis spectroscopy, ELISA, and a thioflavin T assay. Overall, the UV-Vis, ELISA, and thioflavin T assay results demonstrate that phenolic compounds interfere with the aggregation and facilitate the disaggregation process of Aβ. Gallic acid appeared to be the most effective of the phenolic compounds tested. The findings will lead to further understanding of how these phenolic compounds interact with Aβ aggregates and thus can provide information to find more effective treatment options for Alzheimer's disease.

COMMUNICATIONS/JOURNALISM

BRIDGING THE CIVIL RIGHTS KNOWLEDGE GAP OF YESTERDAY AND TODAY

Julia C. Lescarbeau, Holly Weiler, Alex K. Hunter, and Rachel E. Miller (Dr. Frances Ward-Johnson), School of Communications

High profile civil rights cases have recently appeared in the media, including the Michael Brown case in Ferguson and the Eric Garner case in New York. Although some college students have participated in protests regarding these cases, many do not recognize the connection between civil rights issues of the past and the present. The Isabella Cannon Leadership Fellows had the opportunity to study the Civil Rights Movement of the 1950's and 1960's by taking the course, Disarming Injustice: Nonviolence and Civil Rights Movement. Before the class, the students had minimal education and knowledge of the Movement. Students did not fully realize how protest marches and sit-ins were peaceful yet buses were bombed and riders were attacked and beaten. Few people were held accountable for the violence that occurred against these peaceful protestors. This research falls within the topic of the modern generation's perspective on the Civil Rights Movement and education. Twenty-five college students were interviewed and videotaped and answered eight questions, including: (1) What comes to mind when you think about the Civil Rights Movement? (2) Name three people who were a vital part of the Civil Rights Movement. (3) Name a major event from the Movement. (4) Identify a current civil rights issue and share your opinion of it. The interviewees were asked to respond to other questions about today's civil rights issues, including *"Did you vote in the last election?"* Surprisingly, these randomly selected students of various majors, backgrounds and ethnicities, had similar answers. Nearly every student could name only two leaders from the Movement and half of the students interviewed did not vote in the last election, even though they were eligible. This research emphasizes the need for more civil rights education, especially among college students and aims to bridge the gap of civil rights awareness of yesterday to today. This research will broaden students' knowledge and awareness of Civil Rights and will help facilitate Elon's own journey toward diversity and inclusion.

TWEEPS AS SOURCES: A COMPARISON OF LEGACY AND NEW NEWS OUTLETS

Matherly Gainer (Dr. Amanda Sturgill), School of Communications

As numerous AEJMC presentations and popular news articles have noted, the online world has engendered new outlets for news. As the news ecology has continued to splinter, sites like BuzzFeed and Mashable have joined with venerable outlets like newspapers, news magazines and TV stations to present the news of the day. When news comes on the same platform where you can read about gaudy Christmas sweaters or promoted content on how shoe shopping is like dating, it bears investigation of how news on these sites is similar to or different from more traditionally understood news. We ask (R1): What types of sources do journalists monitor on Twitter? And (R2): Are there differences in the types of sources between legacy and new news outlets? **Methods.** We compared journalists at new and legacy media outlets who had an active Twitter presence and for coverage area. From The New York Times, we studied Rukmini Callimachi, a prize-winning former AP Bureau Chief for West Africa who focuses on al-qaeda and Islamic extremism. From the Washington Post, we studied Ishaan Tharoor. Tharoor is a

foreign affairs writer for the Post, and was also a foreign correspondent for Time Magazine. From Buzzfeed, we studied Max Seddon, a foreign affairs reporter who primarily covers the Russian Federation and lives in Ukraine and Amanda Wills, from Mashable, was our final new media case. Wills is a deputy managing editor and in addition to editing news, writes about science for the site. For each journalist, their list of accounts on Twitter that they follow was coded during the Fall of 2014. More than 5,000 accounts were coded and the codes were entered into a spreadsheet, then SPSS for analysis. **Results.** Although both legacy and new news journalists followed large numbers of accounts on Twitter, the patterns of types of accounts they followed differed. Generally, legacy media journalists were more likely to follow legacy media, and to credentialed experts such as professors. New media journalists were substantially more likely to follow accounts in non-English languages and to follow other new media journalists. The differences were significant at the $p<.0001$ level.

THE CANADIAN MISSILE CRISIS: FRAMING OF THE 1962 CUBAN MISSILE CRISIS BY CANADIAN NEWSPAPERS

Stephanie A.N. Bedard (Dr. Harlen Makemson and Dr. Laura Roselle), School of Communications and Department of Political Science and Policy Studies

The Cuban Missile Crisis of October 1962 is widely considered the peak of nuclear tension within the Cold War. While much scholarship is devoted to the media coverage of the Missile Crisis in the United States, scarce attention is given to the representation of the crisis in middle-power states such as Canada. Canada had a deep investment in the Missile Crisis because of both its close alliance with the United States and also its diplomatic relations with Cuba. This

study addresses the following questions: *What frames did Canadian newspapers use in their coverage of the Cuban Missile Crisis, and how were these frames constructed*? Understanding the representation of the Cuban Missile Crisis in Canadian newspapers adds to the body of knowledge on media representations of Cold War events outside of the United States. The study also study points to avenues of further inquiry on media representations of crises by middle-power and allied states, which remains prominent today with the continued growth of global media. Canada also provides a benchmark for outside perceptions of the Cold War, as the country's media are less likely to be influenced by a predisposed pro-American, anti-Soviet bias. To address the research questions, articles in two prominent Canadian daily newspapers, *The Globe and Mail* and the *Toronto Daily Star,* were investigated. Thirty-one non-editorial articles pertaining to Cuba, the Missile Crisis, and political actors in a Cuban context published between October 14, 1962 and October 28, 1962 were analyzed for the presence of 11 frames and construction methods. Results found that Canadian newspapers situated the Cuban Missile Crisis in both a broader global context and a specific Canadian context using the frames of *United Nations and peacekeeping*, *Key leadership figure – Diefenbaker*, and *Escalation of tension*. Further, results show that Canadian newspapers relied heavily on quotations and paraphrases from world leaders to construct frames. Overall, Canadian newspaper representations of the Cuban Missile Crisis provided Canadians with a variety of perspectives and enforced Canada's self-image of an international peacekeeper.

UNRECOGNIZED POTENTIAL: MEDIA FRAMING OF HITLER'S RISE TO POWER, 1930-1933

Katherine E. Blunt (Dr. David Copeland), School of Communications

This research uses media framing theory to assess newspaper coverage of Hitler published in the *New York Times*, the *Christian Science Monitor*, and the *Washington Post* between 1930, the year he reemerged in American media after five years of near absence, and 1933, the year he was appointed chancellor. An analysis of more than 400 articles revealed "credible" frames that focused on his persuasive appeal, popular support, and political clout. It also revealed "non-credible" frames that undermined his credibility by emphasizing his nonpolitical background, his Austrian heritage, and the idea that his party's relative popularity within Germany would fade before he could wield any lasting influence. Though the prevalence of each frame generally shifted based on the perceived stability of the Weimar government, the majority of articles published prior to his appointment to chancellor in January 1933 contained non-credible frames, a trend that continued throughout his first month in office. But after his party won fifty-two percent of the Reichstag following the elections held March 5, 1933, the number of articles containing credible frames increased, suggesting that he was consistently framed as a credible power only after Germany's system of parliamentary democracy officially ended. This research provides insight into the way Americans understood Hitler as he positioned himself to assume the chancellorship and establish the Third Reich.

PRIVACY ON A PUBLIC PLATFORM: A CASE STUDY OF THE ETHICS BEHIND FACEBOOK'S MASSIVE-SCALE EMOTIONAL CONTAGION RESEARCH

Anjelique T. Kyriakos & Rebecca A. Phillips (Dr. Lucinda Austin), School of Communications

Recent events, such as Facebook's emotional contagion research and OK Cupid's compatibility study, have spotlighted issues of data usage and privacy policies. With little prior precedent, companies must find a way to balance ethical and legal issues while operating in a highly transparent industry that allows access to users' personal information. Companies with this access must be especially sensitive to issues of data usage and manipulation of their users. Facebook is used by 58% of all American adults, and the top visited webpage in 50 countries, making it the second most visited webpage in the world (Pew Research Center, 2015). Like many companies, Facebook conducts research in order to improve its services. In June 2014, their research methods were brought into the public eye following the report of a study conducted on emotional contagion among users. The study aimed to investigate Facebook's ability to alter a user's emotions based on the posts on his/her newsfeed. Through a content analysis of the communication between various stakeholders and the public on several media platforms, this case study examines the ethics in Facebook's large-scale emotional contagion research. Did Facebook cross the line in the ethics of its study? Findings suggest that although the study was conducted legally, Facebook received backlash for the deceptive nature of its study. How can other companies avoid similar backlash? The lack of transparent communication between stakeholders led to a global discussion regarding online practices of data usage and privacy.

JET STREAM : AN ANALYSIS OF THE Z-FILL METHOD FOR 2D-TO-S3D ANIMATION CONVERSION

Chelsea E. Lindsay (Professor Nicole Triche), School of Communications

Hand-drawn animation is, by nature, a flat medium. In today's market of animated s3D films (watched with 3D glasses) how can hand-drawn animation compete? Historically, conversion of

hand-animated films from 2D to s3D was a labor-intensive process that did not always yield impressive results. In 2012, Disney's short film *Paperman* showed potential for a new process: combining computer-generated animation (see: Pixar's *Toy Story*) with hand-drawn animation (see: Disney's *Snow White*) to create animation in s3D. In my scholarship, I asked, "How can *Paperman's* 2D-to-s3D conversion model be replicated with publicly-accessible software for the average animator?" To answer this need, I created a new production pipeline, called the Z-Fill method, that combines several software, including one created at Elon for this project, to convert hand-drawn animation into s3D animation. The pipeline is designed to be intuitive for animators with experience in hand-drawn animation, computer-generated animation, and s3D conversion. I workshopped the process by creating a fifteen-second animation using the Z-Fill method. Ultimately, my research proved that it is possible to convert hand-drawn animation into s3D with realism and efficiency, provided the animator is willing to put in the effort to make it possible. The animation created for this project is part of a larger storyboard for a future short film. My thesis project is accompanied by a research paper that describes the historical context and methodology of my work. Surprisingly little research has been written on the topic of hand-drawn s3D films, so I aim to to fill this gap using my paper as an introductory study. The Z-Fill method could be further combined with other software or animation processes to utilize this process for feature films, video games, virtual reality filmmaking, or used as-is by students and small studios across the globe.

ANALYZING FRAMING IN ELON UNIVERSITY STUDENT JOURNALISM

Michael M Papich (Dr. Glenn Scott), School of Communications

Compiling theories about collegiate news media, analysis suggests that because of the unique circumstances on a campus – from the emphasis on academic freedom to increases in diverse populations to the lack of pressure from advertisers – journalistic content can be expected to reflect broader perspectives than content in traditional, commercial media. This research asks to what degree do student-produced TV news stories offer innovative narrative frames, or the tone and focus given to a story. This study analyzes news content on Elon University's Elon Local News as well as similarly themed coverage from student-run TV programs at the University of Southern California, Syracuse University, and Ithaca College. Topics dealing with poverty, LGBTQ rights, and marijuana were analyzed for their range of narrative framing, with all stories falling in a range from Fall 2011 to Fall 2014. Those stories were compared with selected CNN programs on the same topics and narrative framing was compared. Findings showed that ELN and other college news programs did not offer significantly different frames than CNN. These results raise questions as to whether student media should be cultivating a greater diversity of viewpoints available on college campuses or whether the theory suggesting broader perspectives in student media is not as applicable as other explanations.

GLOBAL LEADERS REITERATE HISTORIC INTERNET PRINCIPLES AS CRUCIAL TO ITS FUTURE EVOLUTION

Mia G. Watkins, Skyler A. Cowans, Adrianne M. Haney, Brian A. Mezerski, and Jason M. Puckett (Dr. Anthony Hatcher, Professor Janna Anderson), School of Communications

Do leaders in the ongoing technical and social evolution of the Internet continue to see as crucial today the values first identified by its engineers in the 1990s? In its evolution, the Internet impacts the human condition in the context of connecting people around the globe. This research

is a qualitative content study of recorded statements made by the top Internet leaders about the Internet's status and likely future. Long-form, ethnographic video interviews were conducted in April 2014 at the Internet Hall of Fame induction ceremony in Hong Kong. This study includes the views of 28 people, including 2014 Hall of Fame inductees, Internet Engineering Task Force (IETF) leaders and members of the Internet Society Board of Directors. These Internet developers, pioneers, and evangelists answered an identical five-question set in a formal process. They were asked to share views about the current state of the Internet, the challenges and opportunities likely in its evolution, and to describe the best actions to take for a positive future. A five-student research team from Elon University recorded responses totaling more than five hours of content; the print transcripts total more than 64 pages. The interviews were posted as part of the Imagining the Internet's Center's documentary coverage of the 2014 Internet Hall of Fame Induction. A researcher coded the qualitative content by implementing the Internet Society's list of six "principles that guide our work" (in brief: the ability to connect, speak, innovate, share, choose, and trust). These have been generally recognized by Internet architects and diffusion experts since the emergent years of the organization in the early 1990s. The concepts reiterated most often by these leaders as of the highest value were four of the six principles established by the Internet Society – to connect (Internet accessibility on an equal and open basis for all), trust (to be able to safely and freely send, store, and receive knowledge), innovate (to move beyond today's knowledge and encourage the next generation to continue the growth of the Internet), and share (to maintain interconnectivity of information).

ADVERTISING AMBUSH: THE EXTENT AND EFFECTS OF BRAND PLACEMENT IN CHILDREN-FOCUSED INTERNET ADVERTISING

Sean R. Woolley (Dr. Frances Ward-Johnson), School of Communications

One of the many duties of a parent involves the filtering of messages that your child receives through daily interactions. This used to be a much easier task before the invention of the internet, but research has shown advertisers are using deceptive and effective methods to reach unsuspecting children browsing their favorite sites. This paper, through using a variety of primary, qualitative and quantitative research takes a deeper look into these advertising tactics and their effectiveness when sent to children aged six to fifteen. There is a focus on advertisements pertaining to the food industry and its role in advancing the problem of childhood obesity in the United States. The main questions this research answers are as follows: (1) What are the tactics and techniques being used by advertising agencies to reach children on the internet, and what is their effectiveness? (2) What percent of the top children-trafficked online gaming sites have interactive marketing of some form? (3) What percent of these interactive marketing techniques contain messages that pertain to the food industry? (4) What percent of local elementary school children recognize these online interactive marketing techniques and the messages they contain? (5) Does children-focused product placement in online media deserve government regulation? This paper explores the first question through a review of the overall topic explained with extensive use of relevant, scholarly sources. This is followed by a quantitative website audit, which investigates the second and third research questions. The forth research question is answered through a series of studies held at a local elementary school, which will include both qualitative and quantitative data gathered from children in the immediate community. The fifth question acts as a review of the presented research as well as a call to action brought forth as a result of the research's findings. The call to action is presented in the form of a conversation referring to the backwards nature of government legislature which fights

childhood issues such as obesity on one hand, yet allows advertisers to undermine their work with the other.

UNITED STATES' TELEVISION GOES GLOBAL: THE CASE OF SPAIN

Kathryn L. Jeffords (Dr. Vanessa Bravo), School of Communications

This qualitative research explores the effects of U.S.-produced television on 17 Spanish youth between the ages of 18 and 29, and attempts to explain how the cultivation process occurs for these TV users. The study applies Cultivation Theory, a well-known mass communication theory, to an under-researched population, through exploring the participants' television-viewing patterns, their perceptions about the U.S., and about themselves as Spaniards, and how these perceptions originate. The purpose of this study is to gain a greater understanding of how U.S.-produced television shows influence foreign viewers when they create social constructs about life in the U.S. The study poses five research questions, but the central two are: How do the participants compare life in Spain to life in the United States, regarding aspects such as lifestyle, family life, social life, gender roles, and measures of success? How are they forming these comparisons and what sources of information are they using to create these descriptions about life in the U.S.? The PI conducted in-depth interviews with heavy-television viewers and then transcribed, coded, and analyzed the interviews using the constant comparative method. Results suggest that television viewing is a clear factor in the way these participants define life in the U.S., but third variables such as social interactions at home and abroad also influence the way their perceptions are formed. Overall, the study concludes that the cultivation process is much more complex than previously believed and has an influence on participant perceptions, attitudes and opinions.

COMPUTING SCIENCES

IDENTIFYING THE SOURCE OF AN ANONOYMOUS REVOLUTION

Robert Menke (Dr. Megan Squire), Department of Computing Sciences

Bitcoin is a new form of currency known as a cryptocurrency. This means that it uses principles of cryptography to validate and verify transactions rather than relying on trust in a banking authority. The creator and inventor of Bitcoin is allegedly a man named "Satoshi Nakamoto," but nobody has been able to confirm his identity nor speak with him about the revolution he started in 2008. Numerous groups have attempted to discover his identity by analyzing text from well-known cryptographers and using a technique known as text stylometry to see if these individuals shared common quirks in their writing compared to Satoshi's writing. Others have used time stamps to try to confirm where in the world he might be located. These attempts have suggested possible candidates for the creator of Bitcoin, but still no one has been able to confirm the identity of Satoshi Nakamoto. The focus of our research is to take a slightly different approach to this problem, while also incorporating some of the techniques used by other groups of researchers. We will attempt to build a social network of cryptographers using email archives, compile the written work of Satoshi Nakamoto and other cryptographers, and use other text mining techniques in order to contribute to research being done in the field about this mysterious

man's identity. The idea is that a well defined social network of cryptographers will increase the efficacy of our sentiment analysis by helping us target individuals who have worked with each other on cryptocurrency projects. Once we've established a reliable social network, we will gather papers, emails, written reports, and code from those individuals and compare their writing style to the writing style of Satoshi Nakamoto. The goal of our research will be to produce data sets and analysis examples that can be used by anyone interested in learning about the early history of Bitcoin or its community of cryptographic software developers.

UTILIZING RESPONSIVE WEB DESIGN TO CREATE A COMMON CODE BASE TO SUPPORT MULTIPLE DEVICES FOR NUTRIGEN'S EXISTING PONG SYSTEM

George W Smith (Dr. Powell), Department of Computing Sciences

A short five years ago, web based applications were confined to laptops and desktops. The large screens made the development of a single, mouse driven, web application for both devices simple. However, the overwhelming popularity of mobile phones and tablets of varying dimensions, functionality and resolutions has made the single application unusable. Today, application developers are faced with the problem to not only write and maintain code in the native programming language of each device, but to also create separate design layouts for every different device size. Mobile first, responsive web design is an emerging approach that offers developers tools to create a single application that can dynamically change its appearance and functionality relative to the screen size of the device. The hypothesis of this research is that responsive web design has matured to a point that a single code base can support legacy applications with dynamic layouts customized for all popular devices. The hypothesis will be tested by redesigning and reimplementing a legacy nutrition planning system called Pong by Nutrigen and demonstrating the system running on phones, tablets, laptops and desktops. The development occurred in four steps. The first step was to research Bootstrap, a leading mobile first, responsive web design framework. The second step was to iteratively create Bootstrap story boards showing the layout on each device until approved by Nutrigen. The third step was to port the business logic that powers the program to the Google Cloud using Java Servlets and Java Server Pages with a MySQL back end database. The fourth and most timely step was to develop the code to turn the storyboards into a fully-functional, interactive website. The presentation will include a live demonstration of the nutrition planning application on several devices and a discussion of the process behind designing both the interface and back end services. We will draw conclusions on the viability of implementing responsive web design for PONG deployment on multiple devices as well as highlight the potential benefits and drawbacks of using this approach.

ENGINEERING AN ONLINE MULTIPLAYER GAME THAT ENHANCES CLASSROOM LEARNING

Samuel D. Toma (Dr. Shannon Duvall), Department of Computing Sciences

This research project will extend upon Clashroom, which was created by a previous research team. Clashroom is a multiplayer online game where a player's performance in a game can positively impact their performance in a class. Students begin the game by creating their own pet dragon which they will then train and battle their classmate's dragons. The game is designed to encourage friendly competition and social interaction between classmates. The game would serve as a motivational tool for students to do well in class as well as being a fun game to play.

We hypothesize that if this game is designed correctly to be fun and interesting, students will voluntarily play an optional class-related game that enhances their educational experience. Until now Clashroom was an untested prototype. The lack of finished implementation means that we have not been able to adequately test its effectiveness as a learning aid or its quality as a game. The goal of this research project is to develop a polished version of the Clashroom prototype with practical use in classrooms. We have utilized contemporary open source projects and put emphasis on careful use of software design principles to make the game functional, easily maintainable, and extendable for future collaborators. Using the Phaser HTML5 game framework and a Node.js backend, we have created an application that can scale with increasing students and classes. Our objective is to play test the Clashroom in several actual classes and show that students playing the game are more engaged in class than they would be otherwise. During this presentation we will walk through the progress of the Clashroom game and discuss how gameplay works, how the project is designed, and how we hope to evaluate the overall system.

DESIGNING AND BUILDING AN IRC BOT THAT SUMMARIZES SOFTWARE DEVELOPER CONVERSATIONS

Rebecca C. Gazda (Professor Megan Squire), Department of Computing Sciences

Because of the overwhelming quantity of text data available today, it is increasingly important to develop automated methods for summarizing or recapping this information. In this specific project, what we want to summarize are the topics that software developers are discussing in their conversations with each other. Modern software development often happens electronically, in chat/meeting rooms held on a part of the Internet called IRC (Internet Relay Chat). IRC is a synchronous conversation medium, meaning that the chat happens in real time. If a part of the chat is missed, it is necessary to get caught up quickly on what happened during the absence. This purpose of this project is to design and build an IRC chat bot (a bot that responds to users in chat rooms) that can generate summaries of developer conversations, on request. Our approach for this involves using a program to automatically collect all the developer conversations for a given time frame and to write a chat bot that listens for a request from the user(s) in the chat room, and then provides back an accurate summary of the conversations based on that request. The challenge here is not collecting the conversation data or writing the bot, but in accurately summarizing the conversations. Chatting on IRC is much more casual than the proper English used in official forms of writing, making it harder to use simple off-the-shelf summarization algorithms that are based on word frequency detection. To overcome this hurdle, we are conducting research on alternative summarization algorithms, like the ones used for news articles or blogs. With this information, we can either change the techniques used so that they will work with the more casual chat data, or we can change the format of the chat data as we collect it so it can be used with current summarization techniques. With an accurate summarization bot, we can more easily get a recap of what generally happened in certain chat rooms over the course of the past hour or day. Ultimately, our goal is to generalize the bot to collect a wide variety of types conversations on a number of electronic communication platforms.

DANCE

RELATIONAL CHOREOGRAPHY EXPLORATION

McKenna A. May (Professor Jen Guy Metcalf), Department of the Performing Arts

The most fundamental aspect of life is arguably the interactions we share with those around us. Relationships are how we, as humans, connect on a visceral level, either sharing an inseparable bond, mutual dislike, or somewhere in between. How can these relationships be portrayed through movement? And how does an audience perceive the choreographer's relational intent? These questions fueled my creative research while simultaneously encouraging me to choreograph a cohesive work highlighting familial interaction. Improvisation in its purest form was used to generate movement. This personal exploration fostered feelings of loneliness and the need for companionship. As my established movement was paired with that of my dancers', the overall theme changed to form relational interaction. The answer to my original question came when I put this choreographed movement in front of an audience. Feedback was given about the dancers' spatial relationship, their focus, natural body language, and oppositional partnering work. Utilizing faculty and peer feedback, I found that relational movement is best portrayed by implementing strategic body positioning in space, focus, and weighted contact. If the connection is positive, dancers should give each other their weight when partnering and stay relatively close. Inversely, a negative relationship is best portrayed when the dancers' weight and focus move in opposition. Indifference usually includes complete avoidance of contact and multiple differing paths of movement. I foresee this choreographic piece set in the Great Hall where dancers share the space equally with pedestrians. This site specificity will deconstruct the natural audience/ performer relationship and add an element of unpredictability.

EXPLORING RHETORICAL AGENCY IN UNIVERSITY DANCE STUDENTS

Rachel A. Mehaffey (Professor Lauren Kearns), Department of Performing Arts, Dance

This study explores the ways in which dance students demonstrate rhetorical agency when verbally articulating their experiences in a university dance program. Rhetorical agency is a process by which individuals create meanings through engaging with the world and adapting, learning, and developing in response to the consequences of their actions (Cooper, 2011); in this study, rhetorical agency served as a previously-untapped theoretical framework for conceiving dancers as responsive, active agents. Importantly, this research brought dancers' discussions of their own agency to the center of the study. This approach emphasizes the ways in which dancers talk about the experiences of dancing and learning to dance. Such a focus directs academic attention to dancers' perceptions of their pedagogical, artistic, and developmental practices. Thus, this research projects the dance students' voices into academic conversations about dance education, performance studies, and the scholarship of teaching and learning. In order to investigate how dance students describe themselves as agents, this study employed a series of extracurricular dance labs for a group of six first- and second-year BFA Dance Performance & Choreography majors. Over the course of two semesters, the student researcher worked with the participants on movement-based prompts and debriefs designed to emphasize the dancers' agency and engagement with dance situations. Throughout the academic year, each student participated in four individual interviews, and the content of these interviews was then analyzed using qualitative coding. As a deeply exploratory process, this research has yielded a breadth of insights that can motivate future research. Such insights concern how dancers situate themselves within the dance field, how meaning and power are negotiated in class and choreographic processes, and how dancers learn and change, set goals, and engage with challenges. The overarching conclusion to this study is that when dance students talk about their experiences, they may navigate between describing themselves as active agents, describing a diffuse system of intersubjective agency, and assigning agency to discrete others – such as choreographers,

music, or even their own bodies. This conclusion sheds light on what it means to be a dancer and what it means to talk like a dancer.

AND THEN…

Rachel B. Zain (Professor Jen Guy Metcalf), Department of Performing Arts

My initial research stemmed off of the thought of the common saying, "what happens next?" My question comes from how each individual reacts to tragedy and what is perceived as a tragedy. How the tragedy of one, although unique, is linked to those living in the world around them. I wanted to portray that you are not alone when enduring tragedy. There is the state of sitting and thinking, "what am I going to do next" versus, "what can we do, together, to fix this?" I wanted to break the social norm of a "well-structured" dance. The implications of this would have been not effectively communicating where I want the audience to begin their thought process. As the lights come up, the audience looks at the piece in a fresh, new light. I, however, wanted the audience to begin their thought process as if the climax had already happened. My approach was very experimental in rehearsals. I would come in with a plan in my head that would need manipulating when executing it on dancers. I found that it was something that truly pushed my dancers in their performance execution. The performance didn't just start when they entered the stage, but before that, when they are backstage, mentally preparing themselves. If they aren't in the right mindset, there is no way they would take the audience on the journey.

ECONOMICS

DOES TOURISM ALLEVIATE POVERTY? EVIDENCE FROM UNESCO WOLRD HERITAGE SITES

Caroline E. Crew (Dr. Steven Bednar), Department of Economics

The growth in international tourism over the past couple of decades has shown the potential to contribute to poverty reduction; however, the influence of tourism on poverty is difficult to isolate. The need for an exogenous variable resulted in the use of the World Heritage Site designation as a dummy variable because, while it has been shown to increase tourism, it has not been proven to show a direct impact on poverty. The research uses an econometric model using yearly panel data from the China Health and Nutrition Survey to capture the effects of nine World Heritage Sites in the nine surveyed provinces during the studied timeframe of 1991 to 2006. The diversity and spread of World Heritage Sites established during this time throughout the country gives the research a more in depth look at the direct impact of the designation on tourism and poverty. The results concluded that additional tourism in the surveyed provinces significantly reduced the probability of an individual living below the poverty. Supplementary regressions also tested and showed how much increased tourism can increase wealth in the form of individual income. However, when income was broken down into separate agricultural and business sector earnings, only certain income such as personal business and wage earnings seemed to gain full benefit. Given the ability for tourism to increase wealth so individuals rise above the poverty line, there is a stronger argument for the preservation of World Heritage Sites and growth of the tourism industry as a way to combat the larger goal of poverty reduction.

MICROFINANCE IN INDONESIA: THE IMPACT OF FORMAL BAKNING INSTITUTIONS ON HOUSEHOLDS' PORTFOLIO DECISIONS

Marquessa Kate Smith-Lin (Stephen DeLoach), Department of Economics

Microfinance has become a popular tool in the fight against global poverty. To date, most of the scientific research on the effectiveness of these organizations has focused on the role of micro-credit. However, increasing attention is being paid to micro-savings. Without access to formal savings institutions, the poor are forced to save in relatively ineffective ways, such as through non-cash assets. This research seeks to contribute to the existing literature regarding the impact of micro-savings by examining the effects of access to formal savings on households in Indonesia. The case of Indonesia is particularly interesting because their largest and most widespread bank, Bank Rakyat Indonesia (BRI), is one of the first formal banks to offer savings programs to the poor. In 1986, BRI started the SIMPEDES savings program. To date, no study has investigated the impact of this program on savings behavior of households. This study uses panel data from the Indonesian Family Life Survey (1993-2007) to test whether or not access to formal savings institutions (i.e., BRI) causes a change in households' portfolio decisions. Because BRI branches operate as independent units whose savings and credit offerings differ, variation in the availability of services across branch locations allows us to distinguish between the effects of credit and savings on household decisions. Using multiple regression analysis, this project tests whether households in villages where banks offer savings programs make different portfolio decisions than households in villages without access to savings programs. The findings indicate that access to formal savings has a significant positive impact on the level of liquid assets held by households. These results contribute to the conclusions of previous literature, which has found that formal savings are important in helping low-income households smooth consumption in the event of adverse economic shocks. If access to banking services leads to an increase in households' liquid assets, as this study suggests, then banking access may consequently also enhance the poor's ability to cope with uncertain conditions.

EFFECTS OF THE GENDER WAGE GAP ON WOMEN'S MAJOR CHOICE

Anne E. Barker (Dr. Islam), Department of Economics

Gender discrimination in the workplace has largely impacted women's current attitude toward corporate factors such as wage and employment rate. Despite the narrowing of the gender wage gap, society is still heavily influenced by patriarchal traditions. While gender discrimination is the workforce is well-documented, side effects of this environment that could lead to longer term effects have been understudied. Using the Roy Model of educational attainment and empirical data, this paper will examine the relationship between women's choice of academic study, their future occupations and the gender wage gap within specific occupations, to explain how workplace gender discrimination is affecting women's life choices. This depicts the chance women will choose a major based on the amount of income equality between genders within occupations. The data comes from The National Longitudinal Survey of Youth (Bureau of Labor Statistics from 1979). A dummy variable is used for major identification and occupation identification. Comparing the fraction of women in specific majors to the size of the gender wage gap in occupations that these majors feed into, the effect of the gender wage gap on amount of women entering each major can be observed.

MARRIED TO THE JOB: ALLOCATION OF TIME AND HOUSEHOLD PRODUCTION FOR FULLY EMPLOYED COUPLES

Jennifer A. Smith (Dr. Steve DeLoach), Department of Economics

This paper examines the effect of unemployment and job security on time allocated to household production within married couples. Previous research has found that a sudden increase in unemployment increases time spent on household production. However, research has not been performed on the effects within a married couple that is fully employed. This paper will investigate the presence on reallocation of time during the period of 2003 to 2013. The hypothesis developed for this research is that within a couple, it would be more efficient for the individual with a more secure job and predicted higher wage to spend more time on market work while the spouse contributes more time to house work. "Riskiness" is based on the cyclicality of the individuals' response of industry and occupation. For this case, "risky" industries are construction and leisure and hospitality, and a "risky" occupation is construction. Data used comes from the American Time Use Survey and the Current Population Survey within the timeframe. The regression controls for the following variables: race, education, day of the week, month, state, occupation, and industry. Preliminary results found that within a couple, women spend almost 10 additional minutes per day on household production in a "risky" industry when unemployment increases by one point. Men in "risky" industries have a significant 9-minute decrease per day when unemployment increases by a point.

INVESTIGATING IMPACT OF VERBAL MOTIVATION AND PAYCUTS ON WORKER PERFORMANCE

Matthew Ryan Trogdon (Dr. Mark Kurt), Department of Economics

Monetary incentives are primary means to increase worker output. Some experts argue that monetary incentives can create a crowding-out effect in which the intrinsic motivation to work is decreased. Once the monetary incentives are removed, workers would have lower productivity because their marginal efforts were based upon external motivating factors rather than intrinsic motivation. In theory, verbal motivation can increase morale, and in turn, can increase worker output. This paper examines several theories regarding the relationship between worker output, wage, and external motivating factors. We conducted a field experiment testing the effects of a wage decrease and verbal motivation on worker productivity and efficiency. We hypothesized that verbal motivation would aid in preventing a crowding-out effect when workers were presented with a pay decrease. At this point in the research, we have surveyed 40 students in a two-part experiment and have not established a definitive link between output and wage decrease or verbal motivation.

EDUCATION

THE USE OF ADAPTED PUZZLES ON THE ATTENTION SPAN OF CHILDREN WITH AUTISM SPECTRUM DISORDERAND DOWN'S SYNDROME

Jenna E. Gilder (Dr. Heidi Hollingsworth), Department of Education and Department of Psychology

Many play toys available today are not adapted to the needs of children diagnosed with developmental disabilities and this fact hinders their play success. Play is widely recognized as important for current and later cognitive, emotional, social, and motor development. This study examined the benefits of adapted toys and the use of technology for children with developmental disabilities. The participants included children diagnosed with autism (ASD) or Down's syndrome (DS), and a control group of neurologically typically developing children (ages 4-8). A 3-D printer was used to create standard and adapted physical puzzles, modeled after puzzles currently sold. An electronic version of the puzzle was also created. The researchers hypothesized that children with and without disabilities would prefer the adapted electronic puzzle to the standard and adapted physical puzzles. A second hypothesis was that children with disabilities would dedicate more focus to completing the adapted physical puzzle and the electronic puzzle than the standard puzzle. Results indicated that children with ASD and DS preferred the electronic puzzle over the two physical puzzles and dedicated more attention to the electronic puzzle. The findings from this study provide support for adapting toys, with particular consideration for electronic adaptations, to meet the needs of children with developmental disabilities.

CONNECTING EDUCATIONAL VALUES TO CREATE A LEARNING COMMUNITY WITH STUDENTS AT A HOUSING AUTHORITY

Sara B. Rosenthal (Dr. Mark Enfield), Department of Elementary Education

Realizing that my race and socio-economic status have positively effected my education, I have developed interest and concern for the academic success of learners not born into the same groups. My academic and social experiences at Elon have created an avenue for me to forge my own understandings of social justice, especially in my position as an assistant in an afterschool science enrichment program. With encouragement from my faculty mentor, I framed my experience at the program so that it could be more specific to my interests, which sparked my overarching research question: how can white, upper-middle class educators make a science enrichment program relevant and effective for a group of fourth and fifth graders of minority race living in poverty? Based on the successes my mentor and I had with these students, I argue that current curricular standards (Framework for 21st Century Learning) impose educational values of the Eurocentric white upper-middle class on other ethnic or socio-economic groups, and potentially impede the formation of learning communities. During the program, after each science session, my mentor and I debriefed the effectiveness of our activities, but left personal reactions for our reflective journals. Using reflexive ethnographic techniques we reviewed our entries, finding themes about the environment, our conversations with and between the students, and our emotions and perspectives. Journal entries reflect our evolution into a community. We found that our increase in the use of culturally relevant pedagogy and funds of knowledge enabled us to create a more authentic third space, which, in turn, enabled us to build a community in our "classroom." In this informal setting, we were liberated from curriculum guidelines and were able to witness academic successes in children's inquiry and metacognition. Upon recognizing that traditional guidelines may not work for students within all cultural groups, we adopted a perspective that allowed more room for students to consider how concepts we were learning were relevant to their lives. This relevancy provided the opportunity for students to learn while feeling their culturally constructed values were respected and valued in this educational context.

ENGINEERING

QUADCOPTER CONTROL THROUGH INTEGRATION OF ARDUINO TECHNOLOGY

Ben C. Hay & Jake K. Smith (Dr. Scott D. Wolter) Department of Physics, Dual-Degree Engineering Program

Interest in quadcopters has surged in recent years due to their potential applications for military surveillance and delivery purposes. The benefits of quadcopters come from their ability to have autonomous control while possessing greater stability than conventional helicopter designs. Funding from the Academic Technology and Computing Committee (ATACC) at Elon University has made it possible for research on quadcopter drone technology to begin on campus. The purpose of this project is to build a fully functional quadcopter flight program using Arduino technology. Arduinos are microcontrollers that are compatible with a wide range of devices that can be programmed using code taught at Elon University. The importance of using self-coded programs to fly quadcopters stems from the ability to enhance functionality past simple flight procedures. Using this technology also allows for greater problem diagnostics from the post flight information that Arduinos can provide. Future projects can include but are not limited to: Autonomous flight using GPS and Ultrasonic Range Sensors, package delivery using Electronic Speed Controllers and Pulse Width Modulation, and interactive campus tours using quadcopters in conjunction with mobile applications. The project is still in progress, therefore conclusive information is not currently available, however will be presented at the SURF program.

SMALL SIGNAL AMPLIFICATION FOR LARGER CIRCUIT CONTROL

Alex T. Simoneaux, Jacob K. Smith & Christopher S. Brittlebank (Dr. Scott D. Wolter & Dr. Sirena Hargrove-Leak) Department of Physics, Dual-Degree Engineering Program

There are many types of electrical circuits which are driven by the amplification of small voltage signals. Applications of these circuits include, but are not limited to, speakers, radios, and cellular devices. This research is focused on studying the similarities and differences between the amplification abilities of two different types of circuit components. These components include Operational Amplifiers (Op-Amps) and Bi-Polar Junction Transistors (BJTs). The challenge of this research is to find the most effective method for amplifying analog signals (which are between .5V and 1V) without losing their frequency characteristics. Tests for this project will include studying Op-amps and BJTs isolated from each other and incorporated together. We will try and increase the functionality of each of these components by working around their individual limitations. For example, Op-Amps normally require two separate power sources to create its own potential difference for amplification. This presents an obstacle when attempting to make small and affordable electronic devices. Our research will look into ways of creating a potential reference between one +12V voltage source and ground for supplying these Op-Amps. The drawbacks for BJTs lie in their forward voltage limitation of about 600mV. Finding ways to overcome these issues is another priority for this research going forward. The project is still in progress, therefore conclusive information is not currently available, however will be presented at the SURF program.

ANALOG RC FILTRATION CIRCUITS FOR SOUND DRIVEN LIGHT SYSTEMS

Jacob K. Smith, Alex T. Simoneaux, & Christopher S. Brittlebank (Dr. Scott D. Wolter & Dr. Sirena Hargrove-Leak) Department of Physics, Dual-Degree Engineering Program

RC filters are some of the most commonly used circuit devices in electronic systems. Filters are used in everyday devices like speaker systems and cell phones. RC filters implement resistors and capacitors to distinguish between analog signals of varying frequencies. This research will focus on performing an in depth study on the manipulation and implementation of various types of RC filters for sound driven light systems. We will be focusing on three types of RC filter circuits which include low pass, high pass, and band pass filters. In order to perform this research, we will apply mathematics in the frequency domain so that we can compare theoretical data to experimental data to determine the efficiency of each type of filter. We will then enhance these filters by switching to more complex circuits which will increase their filter response precision. These enhancements include moving to higher order circuits (involving more capacitors and resistors) as well as introducing inductor components which allow for much greater filter precision and accuracy. The overall goal of this research is to create very sensitive analog filter circuits to control light systems with sound signals. The project is still in progress, therefore conclusive information is not currently available, however will be presented at the SURF program.

ENGLISH

"THE MOST PERFECT REASONING AND OBSERVING MACHINE": IDEALIZED MASCULINITY IN ARTHUR CONAN DOYLE'S SHERLOCK HOLMES SHORT STORIES

Carolyn A. Braganca (Janet Myers), Department of English

Can the man Arthur Conan Doyle termed the world's "most perfect reasoning and observing machine" also be considered an ideal masculine figure? This research analyzed Robert Baden-Powell's *Scouting for Boys* (1908), the manual for the Boy Scout movement, and other similar primary texts from the Victorian era to define the ideal Victorian man and applied this definition to Sherlock Holmes from Arthur Conan Doyle's *The Adventures of Sherlock Holmes* (1891-92) and *The Memoirs of Sherlock Holmes* (1892-93). These first two collections of Sherlock Holmes short stories were published and publically adored at a time when British society was undergoing what Elaine Showalter called a "crisis of masculinity." Many political, economic, and social factors contributed to this crisis, but the two discussed by cultural critic John Tosh include the first wave of feminism, which forced men to redefine the line that separated men from women, and growing imperial instability in the colonies, which forced men to redefine the line that separated Englishmen from foreign men. Arthur Conan Doyle was generally regarded as someone who embodied and defended the dominant model of masculinity, and although his most famous character had a unique profession and atypical habits, fans of the stories and even Baden-Powell himself considered Holmes a model of masculine heroism. As this research argues, while Holmes epitomizes rationality—a trait Victorians valued highly in men—the hyperbolic extent of this quality impedes his ability to embody other traits associated with the ideal Victorian man, including chivalry, fitness and health, and patriotism. Through such complications, Conan Doyle illustrated—perhaps inadvertently—the impossibility of adhering to an ideal masculine model.

THE EVERYDAY EPIC: MYTHOLOGICAL BORDERLANDS AND ODYSSEAN RESONANCES IN FRED CHAPELL'S *I AM ONE OF YOU FOREVER*

Emily F. Cinquemani (Dr. Kathy Lyday), Department of English

Fred Chappell's novel, *I Am One of You Forever* (1987), blends the magical and the ordinary, making the world his characters inhabit into a borderland between the fantastic and the real (Rochelle, 2004, p. 186). Scholars have also acknowledged that Chappell embeds universals, archetypes and legends into his novels to tell the story of his central characters, the Kirkman family, lending the novel to myth criticism (Campbell,1993,109). Through this critical lens, one can see the Odyssean and Homeric resonances and references within Jess' narrative. While scholars have acknowledged these resonances, none have examined them in depth. However, like the magical elements of the novel, these classical references weave into the protagonist, Jess', ordinary life, and their fantastic and impossible nature goes unnoticed by the characters. This paper uses myth criticism to examine the way in which Chappell refuses to create a border between the elements of classical myth and the everyday occurrences in *I Am One of You Forever*, forming a borderland between these two spaces. In this borderland, Jess' ordinary adventures resonate with Odysseus' homeward journey, including encounters with seemingly invincible supernatural forces. For example, a telegram announcing a family member's death changes shape and fits into his eye, making it burn. Jess also sleeps in a coffin and dreams that he descends into a type of underworld, and he questions the existence of his storytelling uncle, Uncle Zeno, just as contemporary scholars question Homer's existence. Like Odysseus, Jess changes through his everyday epic and emerges a new person in his old home. These Odyssean elements force the reader to reexamine the ordinary challenges and tragedies of Jess' life and to observe the transformative power of coming of age and grieving, both of which leave Jess in a universally resonant liminal space between the comfort of his old understanding and the complexity of his newfound perspective of the world.

A GOOD NAME IS HARD TO FIND: ONOMASTICS IN FLANNERY O'CONNOR'S *A GOOD MAN IS HARD TO FIND*

Hannah K. Silvers (Dr. Kathy Lyday), Department of English

Flannery O'Connor has long been recognized for her talent for naming the characters in her fiction — onomastic art, as some scholars have deemed it. Scholars Archer, Gordon, Pepin, and Schenck, all agree on this point, and Archer, Schenck, and Pepin have examined specific character names in a few of O'Connor's works. Yet, although *A Good Man Is Hard to Find* (1955) is arguably O'Connor's most famous and widely read collection of short stories, no scholar to date has performed a linguistics-based analysis of the names of characters in those stories. Pepin comes closest to this kind of research in his investigation of the Latin and Biblical roots of character names in "Revelation," a short story published in *Everything That Rises Must Converge* (1965). The goal of this study is to fill a gap in the existing literature, examining an established point of interest and laying the methodological groundwork for future studies. This study analyzes the naming of characters in "A Good Man Is Hard to Find," "The River," "The Life You Save May Be Your Own," "A Late Encounter with the Enemy," and "Good Country People" from a linguistic standpoint, discovering the roots of the names and connecting those roots to significant elements in the stories. Taking cues from existing literature, this study examines in particular the English, Latin, and Biblical or Catholic origins of the character names

in *A Good Man Is Hard to Find*, connecting the origins of those names and their significance to the characters' physical or personality traits, their moral shortcomings, their roles in the story, or their moments of grace.

ENVIRONMENTAL STUDIES

LOCALIZED URBAN DEVELOPMENT IMPACTS ON GLACIER MELT: A CASE STUDY OF LIJIANG, CHINA

Aidan C. Ganzert (Dr. Honglin Xiao), Department of Environmental Studies

Glaciers on the Himalayas have long been considered as Asia's hydrological insurance; however, as population growth and urbanization rates in the region continue rising, this water supply safety has been broken, intensifying the stress on Asia's water resources. Water resources in Asia have already been overexploited, and the way it has been consumed is unsustainable. There is an urgent need to examine the local facets of the urbanization and water supply relationship, particularly within the framework of glacier water as hydrological insurance. This study uses Jade Snow (Yulong) Mountain near the City of Lijiang in the Yunnan Province of China as an example to assess the patterns of glacier and local urban area change. The study analyzes satellite images from 2000 - 2013 to study the changes in land use as well as changes in land surface temperature, particularly in regards to the extent of urban expansion and glacier area on the mountain top. Through a supervised classification of the images, results indicate that the greatest land use change is associated with ice and urban areas over the study period. While ice associated with the Yulong Mountain glacier reduced, urbanization increased at a nearly forty percent rate. The Lijiang County area has expanded its urban areas into formerly forested and agricultural areas, decreasing natural habitats. Urbanization also encroached upon former ice areas, though at a smaller rate. Furthermore, when analyzing the temperature changes in the same study period, it was found that land surface temperature increased in urban and former ice areas. Due to the expansion of urban area driven by tourist industries into the foot and even the top of the glacier mountain, the shrinking of forest land, and the conversion of agricultural land into recreation and cash crop area, the albedo of the land surface is altered thus increasing the temperature around the mountain and possibly accelerating the glacier melt. This land use change is conceivably connected to the glacial melt, though further study should investigate the nature of this relationship.

CENTER FOR ENVIRONMENTAL STUDIES (LOY FARM) COMPARITIVE YEILD STUDY

James G. Johnston, Garrett V. Esler, Joseph P. Milone (Dr. Janet Macfall), Department of Environmental Studies

Our research was centered on setting up a long term ecological research plan for The Center for Environmental Studies (Loy Farm), comparing two methods of agricultural production. Loy Farm is located off of W. Front Street, about a quarter mile off the main campus. The two methods were classified as biointensive and conventional. Biointensive agriculture is a new design for agriculture with a growing body of scientific literature supporting and documenting yields and impact. Biointensive is focused on double-dug raised beds, improving soil health, and obtaining a yield for both food production and carbon for composting. This method has been

successfully implemented in many areas with poor soil quality and the results have been positive for both soil health and food production. We compared this to conventional agriculture which uses row cropping, mono cropping, synthetic fertilizers and pesticides and is not focused on rejuvenating the soils. As the Center for Environmental Studies begins to grow and contribute to the body of scientific literature, this groundbreaking study will lead the way for more research into this method of agriculture. We did in depth research into both conventional and biointensive methods, as well as a Long Term Ecological Research (LTER) plan to be implemented at the site. In addition we gathered data on different plant types, root structures and the specific effects of biointensive and conventional agriculture on the health and quality of the soils. We did benchmark soil testing by taking soil core samples at two different depths throughout our research plot, as well as some preliminary bed preparation for both methods. Our research concluded that a ten year LTER would be the most appropriate length, giving optimal time to record and compare multiple data sets, and the project can easily be transferred to future students. Looking forward we suggested a comparative study between biointensive and conventional agriculture; looking at soil quality, crop production, nutrient analysis of the crops and soil nutrient capacity.

DIVERSITY VS. SUSTENANCE: HOW MAMMALIAN DIVERSITY AND ABUNDANCE CORRELATE WITH AGRICULTURAL PRACTICES

Susie C. Masecar (Dr. Amanda J. Chunco), Department of Environmental Studies

Wildlife habitat continues to be converted into agricultural land to satisfy the demand of growing human populations. These conversions typically cause severe reductions in biodiversity. Therefore, understanding which agricultural practices best mitigate the effects of food production on surrounding biodiversity is a critical conservation concern. Although several studies have explored the relationship between agricultural practices and insect diversity, less work has focused on the relationship between these practices and vertebrate species. In this study, we investigated how agricultural practices relate to mammalian diversity and abundance on 13 diverse farms in the North Carolina Piedmont during the summer of 2014. On each farm, 20 small box traps were used to sample populations of small mammals, and one motion-activated camera was used to sample populations of large mammals. Box traps were opened every other evening and checked the following morning for 9 weeks. Cameras were deployed for 16 weeks. All mammals were identified to the species, and those captured with box traps were marked with an ear tag. Three biodiversity indices (species diversity, abundance, and Shannon index) were compared to pesticide use, farm size, and crop diversity. In total, 58 and 62 individual mammals were captured with the box traps and cameras, respectively. Four mammalian species were captured with the box traps (hispid cotton rat, house mouse, meadow vole, and white-footed mouse), and 8 wild mammalian species were captured with the cameras (coyote, Eastern cottontail, gray fox, Eastern gray squirrel, raccoon, striped skunk, Virginia opossum, and white-tailed deer). Increasing pesticide use and farm size as well as decreasing crop diversity correlated with decreasing small mammal species diversity and abundance. Of the three agricultural practices, pesticide use had the strongest correlation with small mammal diversity and abundance, while the greatest small mammal diversity and abundance was found on farms that either did not use pesticides, or only used organic pesticides. Results suggest eliminating conventional pesticides will best conserve mammalian diversity on agricultural land.

IDENTIFYING AND ASSESSING THE ENVIRONMENTAL IMPACT OF INVASIVE PLANT SPECIES FOUND AT THE GLENCOE SECTION OF THE HAW RIVER TRAIL.

Nicholas P. Mastrocola (Professor Michael Strickland), Department of Environmental Studies

Across North Carolina, land managers, scientists and everyday people face a variety of challenges involving the eradication and control of invasive species. Many invasive species are known for their ability to destroy biodiversity by invading and driving out native species by dominating the food chain and other available resources. The purpose of this research was to investigate the presence of invasive species located along the Glencoe Section of the Haw River Trail on the behalf of the Nature Center at Glencoe and the Nature Center coordinator, Robert Woody. This research was conducted as a part of a team project for my senior seminar in Environmental Studies, and our primary goal was to create a field guide and trail signage for hikers along this section of the Haw River. Using invasive species identification field guides, I investigated the trailside and the banks of the Haw River for invasive vine, tree, and shrub species. High species dispersal rates, infestations, as well as plants species with unique attribute were all indications of a possible invasive species. Six different plant species were photographed and preliminary identified as an invasive species. Each species was analyzed for its invasive characteristics, possible means of eradication, and negative impact on the environment using an Invasive Specie Assessment Protocol. Five out of the six documented species were identified as invasive to the Glencoe section of the Haw River trail. Two of the found species had a moderately negative impact on the trail region. This research revealed that he Glencoe Section of the Haw River Trail is impacted by at least five invasive species, with at least two species negatively impacting the environment. With conservation and preservation of the Haw River as the main goal of the Nature Center at the Glencoe Mill, more resources and further research should be devoted to investigate eradication methods to further reduce the impact on the environment.

STREAM GEOMORPHOLOGY OF LOW FLOW HEADWATER STREAMS IN PAIRED URBAN AND EXURBAN WATERSHEDS

Helen C. Peplowski (Dr. Ryan Kirk), Department of Environmental Studies

This project is the first phase of a long term monitoring program of stream sediments in urban and semi-rural (i.e. exurban) headwater streams. Headwater streams, defined as those streams without any upstream tributaries, constitute as much as 70% of the total stream length in the United States (Lowe and Likens, 2005) and contribute as much as 2/3 of the Nitrogen load in downstream rivers (Alexander et al. 2007). However, most water monitoring occurs only in larger waterways. We measured stream channel characteristics above 34 confluence points within the Dry Creek (which includes the Elon University Forest) and Little Alamance Creek watersheds and used a Geographic Information System (GIS) to classify land cover and assess landscape effects on headwater stream characteristics. At each site we measured a breadth of geomorphological characteristics, including bankfull height, bankfull and channel bottom width, bank slope angles, entrenchment width (width at twice bankfull height), riparian vegetation class, rooting depth, and stream channel substrate. Using GIS, we delineated the watersheds upstream of each sampling site, classified land cover within the watershed, and measured upstream stream lengths. Finally, we use the widely-applied Rational Method to estimate maximum stream flow at each sampling site. Combined, this analysis provides a comparative quantitative assessment of

urban and exurban stream geomorphology, which will help contextualize future sediment sampling in these streams and provide insights towards water management recommendations.

EXERCISE SCIENCE

"CULTURAL COMPETENCE AND RELATIONSHIP EFFECTS BETWEEN ATHLETES AND COACHES"

Ashley M. Brown (Dr. Eric Hall), Department of Exercise Science

This study uses an investigative approach to examine how much cultural competency between minority/diverse athletes and their predominantly White coaching staff, affects their personal relationships. And more importantly how the athlete performs on the field. The results from this research should provide a framework for mentors, coaches, teachers and those holding managerial positions, to become more aware of how their mentee perceives them from a culturally accepting mentality. In this study, there are three things that will be looked at: the level of cultural competency of the athlete, how the level of cultural competency impacts the relationship with the coach and how both of those elements impact the athlete's performance. The student-athletes completed the following surveys: The Global Perspective Inventory Survey (GPI) and the Cultural Diversity Self- Assessment (CDSA) to determine cultural competence. The GPI contains 6 subscales: Cognitive-Knowing, Cognitive-Knowledge, Intrapersonal-Identity, Intrapersonal-Affect, Interpersonal-Social Responsibility and Interpersonal-Social Interaction. The combination of the subscales in the GPI survey and the Diversity assessment will give an in-depth look into the student athlete's perspective of the campus climate and its relation to diversity at Elon University. The results from our preliminary analyses suggest that within a sample of student-athletes various descriptive variables do not influence levels of cultural competency. As this research project continues, the results from this group of student-athletes will be compared to norms present as well as compared to a population of students from the same institution. These results may be helpful to see if student-athletes have the same levels of cultural competence as other students. The results from these surveys have potential to help athletes and coaches at a community, high school, college and professional sports level.

THE EFFECT OF FOOT STRIKE ON LEG MUSCLE ACTIVITY WHEN RUNNING BAREFOOT

Chelsea T. Gemme, (Joyce A. Davis, PhD), Department of Exercise Science

Barefoot running has become a popular alternative for many runners. While there is a growing body of research related to barefoot running, a limited number of studies have been conducted regarding foot strike or how the foot makes initial contact with the ground. This study used electromyography (EMG) to examine the effect of three foot strike patterns on contraction of the gastrocnemius and tibialis anterior muscles. The patterns were heel, mid, and fore foot strikes. To study the effect of different foot strikes on muscle activity when running barefoot fifteen females ages 19-22 years old completed the study. Each individual was an active runner averaging 5-20 miles per week over two or more days per week. Participants completed an orientation session 2-4 days prior to the test session. During orientation, participants were familiarized with wearing EMG electrodes while running barefoot on a treadmill. The Borg Rating of Perceived Exertion (RPE) scale was introduced and participants selected a running

speed to achieve a moderate RPE for a 15 minute run. The testing protocol included a warm up followed by three running bouts at the prescribed speed and assigned foot strike. The order of foot strike assignment was randomized. Participants watched a 30 second instructional video demonstrating the assigned foot strike at the beginning of each bout and data were collected during the final minute of each condition. The maximum EMG value (μV) for each muscle in each condition during the 5 second collection was chosen for analysis as representative of maximum muscular contraction. Data were analyzed using a one-way analysis of variance. There were no differences observed in peak contraction values for the medial or lateral head of the gastrocnemius in any of the foot strike patterns ($p = .088, .961$ respectively). Peak values for the tibialis anterior were significantly higher in heel strike ($M=97.43$, $p = .001$) than midfoot ($M=59.94$) or forefoot ($M=60.68$). This baseline information will contribute to the overall knowledge in the field of barefoot running and can be of importance to those looking to lose their shoes and make a safe, injury free switch to running barefoot.

CULTURAL CONTEXT OF LEARNING: THE PHYSIOLOGICAL MECHANISMS OF THERAPY BALL SEATING ON CLASSROOM PERFORMANCE

Molly E. Burgoyne (Dr. Caroline J. Ketcham), Department of Exercise Science

The academic success of students is a major concern in American culture. Many classrooms are beginning to substitute standard chairs with therapy balls, which help to improve students' focus and classroom performance, according to teacher and student reports. Therapy balls are a type of heightened sensory tool, which are often used in physical and occupational therapy as a strategy for individuals with learning or sensory differences. Heightened sensory tools increase the sensory information that the brain receives and have been effective at improving attention and classroom performance. However, no studies explain why these tools are successful. An observational study indicated that attention and on task behavior in an academic setting improved with the use of therapy balls compared to standard chairs and that the effect of vestibular and proprioceptive input should be further investigated in a laboratory setting. Researchers performed an experimental study with elementary school age participants, grades 2 through 5, ($N = 20$) to examine the effect of heightened sensory stimulation on the performance of functional school tasks and standard balance tasks. Subjects performed math and comprehensive reading tests during seating on a standard chair, seating with increased vestibular input, and seating with increased proprioceptive input. They also completed static balance tasks with eyes open/closed on a firm/foam surface using the Biodex Balance system. Results suggest that with the utilization of therapy balls, school function is either the same or better compared to a standard chair. In addition, sway scores increased during balance tests performed after spending time on the stability ball. Therapy ball seating activates the sensory system, allowing it to integrate more sensory stimuli during the balance test. Over time, heightened sensory tools have the potential to improve sensory integration so that students are better able to attend to relevant stimuli in a classroom setting. This research has the potential to help develop specific, evidence-based training for teachers and students on the appropriate strategies to use alternative seating in a classroom setting. Therapy balls are a simple modality that can shape the cultural context of learning in a way that is beneficial to development and education.

EFFECTS OF SINGLE-NUCLEOTIDE POLYMORPHISMS IN APOE ON CONCUSSION SUSCEPTIBILITY, SEVERITY, AND RECOVERY TIMES IN COLLEGIATE ATHLETES

Graham D. Cochrane, (Dr. Eric Hall & Dr. Caroline Ketcham), Department of Exercise Science

BACKGROUND: There is conflicting research regarding how the outcomes of mild traumatic brain injuries, such as concussions, can be influenced by polymorphisms of cerebral proteins. Understanding what proteins play a role in concussion susceptibility, severity, and recovery time can lead to a better understanding of the underlying causes of concussion symptoms and possible treatments. The current study investigates the effects of polymorphisms of the Apolipoprotein E (APOE) and APOE promoter genes on baseline cognitive function in student collegiate athletes, their concussion history, and outcomes of any concussion sustained after baseline cognitive testing. METHODS: 155 collegiate student athletes completed the Immediate Post-Concussion Assessment Test (ImPACT^{TM}), Erickson Flanker task, and auditory oddball task during a cognitive evaluation to be utilized in the case of a concussion. Cheek swabs were collected from all athletes. Single-Nucleotide Polymorphism (SNP) genotyping was run on all genetic samples to determine both APOE and APOE promoter genotypes. Subjects were split into groups based on their respective genotypes for each gene, and the average score for a number of cognitive measures recorded by the ImPACT™ test (Memory comp. verbal, memory comp. visual, visual motor score, reaction time, and impulse score) and average latency for both the Erickson Flanker and auditory oddball task were compared between the groups to determine what effects polymorphisms for both genes could have on performance before and after concussion. Past concussion history was also recorded, and, if the athlete sustained a concussion, the athlete returned to the lab during recovery to complete the same protocol as post-concussion data. RESULTS: ANOVA analysis found that there were no significant differences between the groups for either set of polymorphisms for any of the cognitive measures analyzed, nor was there any relationship between different genotypes and susceptibility to concussion. CONCLUSIONS: SNP polymorphisms of the APOE gene and its promoter gene have no significant effect on cognitive performance, concussion susceptibility, or concussion severity in collegiate athletes.

NEUROCOGNITIVE PERFORMANCE AND CONCUSSIONS: INFLUENCE OF HEADACHES, MIGRAINES, DEPRESSION, ANXIETY, ATTENTION DEFICIT DISORDERS AND EXERCISE

Jordan E. Cottle (Dr. Eric E. Hall), Department of Exercise Science

BACKGROUND: Immediate Post-Concussion Assessment and Cognitive Testing (ImPACT) is a neurocognitive assessment commonly used to assist in return to play (RTP) decisions after the diagnosis of a concussion. The baseline test scores for the athlete can be compared with their post-injury scores to determine whether cognitive functioning has returned to normal and then be allowed to RTP. It has been suggested that prior factors may influence baseline scores. These same factors may influence concussion history. **PURPOSE**: To determine factors that may influence performance on the ImPACT and concussion history. **METHODS**: 503 Division I collegiate student-athletes completed the ImPACT. These student-athletes came from football (n = 185), men's soccer (n = 55), women's soccer (n = 62), baseball (n = 58), softball (n = 27), men's basketball (n = 22), women's basketball (n = 22), women's volleyball (n = 18), women's lacrosse (n = 25); women's track and field (n = 20) and women's tennis (n = 9). The ImPACT calculates scores for verbal memory, visual memory, visual-motor speed and reaction time as well as a total symptom score. The following variables were examined: treatment for headaches, migraines, psychiatric conditions (e.g., anxiety, depression, etc.); diagnosis for ADD/ADHD and

whether they had exercised strenuously 3 hours prior to assessment. **RESULTS**: Those who had received treatment for headaches ($p = .001$) and psychiatric condition ($p = .005$) had higher rates of concussion. Total symptom score was significantly different for those who received treatment for headaches ($p < .001$), migraines ($p = .001$), psychiatric condition ($p < .001$) and having been diagnosed with ADD/ADHD ($p < .001$). Visual motor speed was significantly greater in those who had received treatment for migraines ($p = .001$) and visual memory was significantly lower in those who had been diagnosed with ADD/ADHD ($p = .024$). Having exercised prior to the assessment did not influence ImPACT. **CONCLUSION**: The influence of headaches, migraines, psychiatric condition and ADD/ADHD on total symptom score is important because being asymptomatic is one of the main criteria for RTP. This suggests that medical professionals need to be aware of preexisting conditions as RTP decisions are made.

POTENTIAL FACTORS INFLUENCING RECOVERY FROM CONCUSSION IN COLLEGIATE STUDENT-ATHLETES

Kayla P Harvey (Dr. Eric Hall), Department of Exercise Science

BACKGROUND: Concussions among collegiate student-athletes are frequent, with as many as 300,000 sport related concussions occurring each year. Recovery from concussion differs among individuals. Therefore, additional research needs to be conducted on factors that may influence concussion recovery so that return-to-play guidelines can be made specific to each individual. PURPOSE: The purpose of this study was to determine potential factors that influence recovery from concussion. METHODS: The participants fill out a computerized survey which asked questions regarding their demographics, collegiate athletic experience, as well as medical conditions. Athletes who sustain a concussion were then asked to fill out an additional section about their symptoms and how many days they experienced symptoms. 45 Division I collegiate student-athletes completed the surveys. These student-athletes came from football (n=17), women's soccer (n=5), men's soccer (n=2), volleyball (n=4), baseball (n=4), women's basketball (n=5), men's basketball (n=2), softball (n=3), cross country (n=1), lacrosse (n=1), track and field (n=2), and women's tennis (n=1). This study examined whether gender, type of sport played, and previous diagnosis of Attention Deficit Disorder (ADD) or Attention Deficit Hyperactivity Disorder (ADHD) influenced recovery. RESULTS: Self-reported data shows that some sports had a longer recovery period based on the number of days post-concussion that they still experienced symptoms. Track and Field had the longest mean recovery (13 days), followed by lacrosse (12 days) and volleyball (11.8 days). Females also showed a longer mean recovery period (9.3 days) as compared to males (6 days). Additionally, participants who had a previous diagnosis of ADD/ADHD had a longer mean recovery period (8.5 days) compared to those who did not have a diagnosis of ADD/ADHD (7.5 days). CONCLUSION: Results of this study suggest that the makers of the return-to-play guidelines should be cognizant of different variables, such as gender, sport, and diagnosis of ADD/ADHD that may influence recovery from concussion. Therefore, guidelines should be specific to each individual, rather than generalized for the entire student-athlete population.

THE EFFECTS OF FISH OIL SUPPLEMENTATION ON COGNITIVE FUNCTION

Samuel Hershberger (Drs. Paul C. Miller and Eric E. Hall) Department of Exercise Science

Omega-3 polyunsaturated fatty acids (n-3 PUFA) have received considerable attention in the literature. Research suggests that in addition to improving heart disease, hypertension, and

rheumatoid arthritis; n-3 PUFA may also support neuronal health and cognitive function (Carlson et al., 2012; Crupi, 2013). n-3 PUFA's are commonly found in fish oil (FO). However, what is yet to be shown is how consuming FO supplements impacts cognitive function. **PURPOSE:** The purpose of this study was to examine the impact of FO supplementation on cognitive function in healthy adults. **METHODS:** This study used a double-blind, repeated measures design. Each participant (n=31) was randomly assigned to consume either 1.2 g FO or a placebo (PL; 1.3 g 10-grain gelatin) twice daily for 4 weeks. Cognitive function was assessed 5 times using the Stroop Task (ST) and the Contingent Continuous Performance Task (CPT). The 5 test sessions were each separated by one week. Session 1 was done on the initial visit to the lab and was used to establish baseline cognitive function. Following session 1, participants began their assigned supplementation regimen. Sessions 2-5 were identical to session 1. Sessions 2,3,4, and 5 were completed on days 7, 14, 21, and 28. **RESULTS:** A repeated-measures GLM revealed no significant differences in accuracy or reaction time on the ST or CPT between the FO and PL conditions ($p>.05$). **DISCUSSION:** Analysis showed that both the FO and the PL groups improved on the CPT and ST from session 1 to session 2 but then plateaued at session 3 indicating that FO in these doses may not be effective in augmenting cognitive function. These results may have been impacted by the number of participants, participant adherence to the supplement regimen, and the difficulty of the cognitive tasks. Future research may want to explore dose-response relationships of FO and cognition, as well as the absorption rate of FO.

CHANGES IN GAIT ARE MORE SENSITIVE TO CURRENT SYMPTOMS THAN HISTORY OF CONCUSSION AMONG STUDENT-ATHLETES

Emily L. Messerschmidt (Dr. Srikant Vallabhajosula), Department of Exercise Science and Department of Physical Therapy Education

BACKGROUND: While many studies have been conducted to evaluate changes in cognitive and motor function of individuals with concussion, there is minimal research on the chronic effect of concussions, especially related to gait. Previous research studies have shown that post-concussion, individuals walk more slowly, with altered gait stability, spend more time in the double-support phase and lesser time in the single-support stance compared to individuals without concussion. However, studies comparing effect of current symptoms with history of concussion are minimal. PURPOSE: To test the effect of history of concussion and present symptoms on gait among student-athletes. METHODS: 69 subjects (mean±SD: 18.3±1.1 years) walked across GaitRite system at self-selected pace. At the time of testing, 22 subjects reported a history of one or more concussion and 36 subjects reported at least one symptom. All subjects performed 5 trials each under single task (plain walking) and dual task (walking while counting backwards by 7). Dependent variables included velocity, cadence, single support time, double support time, step length, step width, and stride length. An average of the 5 trials was used for analysis. A history (no concussion, concussion) X task (single, dual) ANOVA was performed for each dependent variable. A symptom (present, absent) X task (single,dual) ANOVA was also performed for each dependent variable. RESULTS: No significant main effects or interaction were observed for any of the variables for history of concussion. However, there was a significant interaction between symptoms at time of testing and task, specifically for step length and stride length (P=0.006). Subjects who reported at least one symptom at the time of testing had significantly greater reduction in step and stride length in from single to dual task. DISCUSSION: Reduced step and stride length could indicate that athletes with current symptoms adopt a safer gait strategy. Our results suggest that student-athletes previously

diagnosed with a concussion may not show long-term effects of gait changes. However changes in gait might be sensitive the current state of the system as assessed by symptoms at the time of testing. Thus gait analysis might be useful in assessing recovery among student-athletes.

EFFECTS OF PRE-EXERCISE ENERGY BAR ON 10K RUNNING PERFORMANCE

Ann Marie Nunnelee and Katie M. Umbdenstock (Dr. Svetlana Nepocatych), Department of Exercise Science

Energy bars provide a quick way to supply pre-exercise nutritional needs. However, the full effects of different types of energy bars on exercise performance are not yet known. Purpose: To assess the effects of two pre-exercise energy bars on 10K running performance, other physiological and perceptual measures in recreationally active females. Methods: 15 college-aged females volunteered to participate in the study (weight 58 ± 8.7 kg, height 164.5 ± 5.5 cm and relative body fat 20.1 ± 3.7%). Each participant completed two testing sessions in counterbalanced order, which included an 8-hour overnight fast, 24-hour dietary recall, consumption of either Power Bar (PB) or Snickers Marathon Bar (SMB) within 30 minutes of the time trial, 10K run, fasting and pre-10K and post-10K blood glucose measurements. Heart rate (HR), RPE, first and second 5K times, final 10K time, perceived recovery, gut fullness and bar preference was recorded for each trial. Results: Repeated measures ANOVA indicated significant difference ($p < 0.001$) in blood glucose levels between fasting, pre-10K and post-10K (67 ± 11, 100 ± 19, and 101 ± 22 mg/dl for PB and 68 ± 7, 82 ± 7, and 97 ± 17 mg/dl for SMB, respectively). In addition, blood glucose levels were consistently higher ($p = 0.007$) for PB compared to SMB. However, there was no significant difference in average 10K time (52.38 ± 11.7 min and 51.93 ± 13.1 min, $p = 0.17$), final 10K HR (181 ± 20 and 179 ± 19 bpm, $p = 0.61$), RPE (15 ± 2 and 16 ± 2, $p = 0.80$) and PR (5 ± 3 and 6 ± 2, $p = 0.37$) between PB and SMB Conclusion: No significant difference in 10K running performance time or other physiological and perceptual measures were observed between the trials, despite, higher blood glucose levels following consumption of Power Bar.

MIRROR NEURON SYSTEM ACTIVATION IN DANCERS: IMPLICATIONS FOR OBSERVATIONAL LEARNING

Lauren E. Packard (Dr. Caroline J. Ketcham), Department of Exercise Science and Neuroscience Program

The function of the Mirror Neuron System (MNS) in the motor cortex is still unclear, however it has been implicated in many human behaviors including observational learning, motor planning, and empathy. Previous studies have established that individuals who are experts in a motor skill have elevated MNS activity when they observe someone performing the motor skill in which they are trained. The present study was conducted to determine if expert dancers had different MNS activity when observing dance when compared to non-dancers, and if MNS activity was correlated with the ability to learn a novel motor task through observation. EEG was recorded while dancers (n=20) and non-dancers (n=20) watched a randomized set of ballet, American Sign Language (ASL), and non-biological movement videos. Participants were then asked to observe and perform a novel movement (a series of new ASL phrases). Performance on this task was measured by speed and accuracy. Because mu frequency suppression occurs at when an individual executes a motor movement or observes human movement, EEG data at the mu frequency (9-11Hz) was analyzed to reflect MNS activity. Mu suppression data indicated that

MNS activity in dancers was significantly different from the MNS activity of non-dancers within the observational conditions ($p=0.028$). Additionally, the dancer and non-dancer groups showed activation at different sites of the motor cortex ($p=0.022$). Behavioral results indicate that dancers were faster and more accurate when performing more complex ASL phrases than non-dancers. MNS activity level during observation and ability to correctly perform a novel ASL phrase are better in dancers compared to non-dancers. These results provide evidence that MNS activity is related to transference of motor skills, which may be a mechanism for observational learning.

NEUROCOGNITIVE FUNCTION IN CLUB SPORT STUDENT-ATHLETES WITH ATTENTION DEFICIT DISORDER AND HISTORY OF CONCUSSIONS

Kara G. Soler-Sala (Dr. Caroline J. Ketcham), Department of Exercise Science

BACKGROUND: Attention deficit disorder and/or hyperactivity disorder (ADD/ADHD) is a common neuropsychiatric disorder that may contribute to concussion risk and recovery. This disorder is characterized by symptoms of impulsivity and inattention and can persist through early adulthood. Statistics show that approximately 4 to 10% of high school and college students have been diagnosed with ADHD and it is estimated that 5-10% of athletes will experience a concussion during any given sport season. Previous research has shown that differences exist on the ImPACT test battery between ADHD athletes and athletes without ADHD. PURPOSE: The purpose of this study was to examine neurocognitive differences between athletes with and without ADHD and history of concussions. METHODS: The Immediate Post-Concussion Assessment and Cognitive Testing (ImPACT^{TM}) test was used to determine neurocognitive function in 190 club athletes (Rugby, Lacrosse, Ice Hockey, Equestrian). ADHD diagnosis and concussion history information were also gathered. Of all athletes tested, 73 had a history of concussions, 28 had an ADHD diagnosis, and 11 of those diagnosed with ADHD had a history of concussions. RESULTS: Significant differences in reaction time ($p<0.05$), visual motor speed ($p<0.05$), and symptom score ($p<0.05$) were observed between those with ADHD and those without. In addition those with ADHD and a previous history of concussion had significantly different reaction time ($p<0.05$) and symptom scores ($p<0.05$) compared to those with ADHD and without a history of concussions. CONCLUSION: These findings suggest that individuals with ADHD and concussion history may have a slower reaction time, visual motor speed, and higher symptom score as compared to athletes without ADHD who have had a previous history of concussions. Post-concussion symptoms such as poor concentration, memory, and anxiety may parallel ADHD symptoms, which could affect return to play decisions and concussion management. ADHD and history of concussions may influence neurocognitive function and be an important consideration in concussion recovery.

THE EFFECTS OF CITRULLINE MALATE SUPPLEMENTATION ON MUSCLE SORENESS AND CONTRACTILE FUNCTION

Anna E. Stapleton and Jennifer Gehrin (Dr. Paul C. Miller), Department of Exercise Science

The consumption of citrulline malate (CM) has been shown to attenuate muscle soreness following intense exercise. Consuming CM increases nitric oxide production leading to increased blood flow, glucose and fatty acid metabolism, and muscle repair (Perez-Guisado and Jakeman, 2010). What has yet to be shown is the impact of CM consumption on the restoration of muscle

function. PURPOSE: To examine the effects of CM supplementation on muscle soreness, pressure pain threshold (PPT), and contractile function. METHODS: Thirty women participated in this study. This study used a double-blind, matched-pairs design. Participants were randomly assigned to a CM or a placebo (PL) group. The participants completed four sessions. On day 1, participants completed an informed consent, a muscle soreness questionnaire (MSQ) focusing on their right calf, were assessed for pressure pain threshold (PPT) of the calf, and were assessed for plantar flexion (PF) contractile function using a Biodex isokinetic dynamometer at 1.05 $r \cdot s^{-1}$ and at 3.14 $r \cdot s^{-1}$. Participants then consumed either 7g CM or a PL. One hour after consuming the supplement, participants completed a step protocol to induce muscle soreness. The protocol involved seven sets of stepping lasting 5 minutes each with a 1 minute rest between sets. Sessions 2-4 occurred at 24, 48, and 72 hours post-stepping. Sessions 2-4 were identical. Participants completed a MSQ, were assessed for PPT, and were measured for plantar flexion contractile function. Gain scores were calculated and analyzed using an ANOVA. RESULTS: Differences were seen for peak torque (CM: 12.7±12.6%; PL: -29.0±9.1%; p=.01); for average power (CM: 45.8±27.4%; PL: -17.2±15.7%; p=.05); and for total work (CM: 28.3±24.9%; PL: -31.1±10.1%; p=.04) at 3.14 rad/sec at 72 H post-stepping. No differences were seen in contractile function between CM and PL at 1.05 rad/sec. No differences were seen for MSQ and PPT between CM and PL. DISCUSSION: While it appears that CM supplementation in this dosing may not attenuate muscle soreness, it may be an effective strategy to recover muscle contractile function following the onset of mild DOMS. The reported vasodilating capabilities of CM may have facilitated muscle recovery by allowing nutrients to reach the muscle more effectively.

THE EFFECT OF COMPRESSION SOCKS ON RUNNING PERFORMANCE IN RECREATIONAL FEMALE RUNNERS

Christine C. Treseler (Dr. Nepocatych and Dr. Bixby), Department of Exercise Science

Purpose: To assess the effects of graduated knee-high compression socks on 5K running performance in recreationally active women. **Methods**: 19 females were recruited to participate in the study, age (20 ± 1 y), weight (61.4 ± 5.3 kg), height (163.4 ± 9.8 cm), BMI (22 ± 2), relative body fat (22.6 ± 3.9%), and resting heart rate (70 ± 9 bpm). Each participant completed two 5K performance time trials with compression or regular socks in a counterbalanced order separated by one week. For each session, heart rate (HR), time, Rate of Perceived Exertion (RPE), pain pressure threshold, Delayed Onset Muscle Soreness (DOMS), and perceived recovery were measured. **Results**: A repeated measures ANOVA indicated no significant difference in average 5K times between compression and regular socks (1515.5 ± 173.3 and 1519.9 ± 182.5 seconds, respectively, $p = 0.74$) and final HR (188 ± 9 and 187 ± 10 bpm, respectively, $p = 0.42$). In addition, there was no significant difference in whole leg DOMS 24 hours post-run ($p = 0.388$) and calf DOMS 24 hours post-run ($p = 0.30$) between compression and regular socks. However, there was a significant difference ($p = 0.01$) in whole leg DOMS over time between the compression socks and regular socks, when measured pre-trial, 30 minutes post-trial, and 24 hours post-trial. DOMS decreased over time with compression socks, whereas DOMS increased over time with regular socks. Additionally, there was a significant difference between compression socks and regular socks in RPE (15.3 ± 2.0 and 14.6 ± 1.8, respectively, $p = 0.05$) and post-run pain threshold (13.6 ± 6.4 and 12.2 ± 4.4, respectively, $p = 0.02$). **Conclusions**: Based on the results of the present study, there were no significant improvements in 5K running performance or heart rate. There were significant improvements in rate of perceived exertion and post-run calf muscle sensitivity. In our study, compression socks

do not show any significant physiological improvements, however runners may benefit from differences in perception of comfort, pain, and soreness perception.

HEALTH AND HUMAN PERFORMANCE

THE EFFECT OF PARTICIPATION IN A MENTOR BASED HEALTH EDUCATION PROGRAM ON SELF-ESTEEM AND PERCEIVED INFLUENCES ON BODY IMAGE IN MIDDLE SCHOOL GIRLS

Marguerite H. Rix (Professor Elizabeth Bailey), School of Education, Department of Health and Human Performance

The mission of the Girls to Empowered Teens (GET) program is to empower middle school girls to make healthy choices through education, the use of college women as mentors, and skill building in sports/fitness and communication in an effort to enhance self -esteem, build social support and improve overall health. Relationships with mentors, either assigned or naturally occurring, have been associated with better communication skills and improved self-esteem in adolescents. Previous data collected from similar programs (Alamance Girls in Motion and CHAMPS) suggests mentorship, health education programming, and physical activity does result in increases in self-esteem and body satisfaction from pre to post participation in 4th and 5th grade students. The purpose of this research was to determine the effect of an 8-week mentor based, health education program on self-esteem (SE), drive for thinness (DT), body dissatisfaction (BD) and perceived body image (PBI) in 6th and 7th grade girls. Twenty girls volunteered to participate in this study. Consent was obtained from parents at the orientation. Each girl completed a series of questionnaires to determine personal interests and to evaluate self-esteem (Rosenberg Self Esteem Questionnaire) and perceived body image (Body Image Survey from the Cooper Clinic and a body image/body satisfaction questionnaire previously used in research with the AGIM program) during the first program session. College women volunteered to participate as mentors and received appropriate training prior to the start of the program. Each of the 8 sessions included one on one mentor time, physical activity, and health education on pertinent topics in a small group setting. Questionnaires were completed again during the last program session. There were no significant differences from pre to post on any of the measures. This may be explained by the fact that participants indicated normal levels of self-esteem before starting the program ($SE_{pre} = 30.5 \pm 0.99$), as well as healthy perceptions of body image on all measures. While individual changes did occur from pre to post, it is possible that by middle school, perceptions of body image are well-ensconced and thereby resistant to change for this type of programming.

THE DISCREPANCY IN NUTRTION BETWEEN UNDERCLASSMEN AND UPPERCLASSMAN IN RELATION TO THE RESIDENTIAL ENVIRONMENT

Lily A. Savoie (Professor Elizabeth Bailey) Departments of Public Health Studies and Health and Human Performance

As students enter college, many are making personal food choices for the first time. Data on food consumption typical on university campuses indicates that dining plans expose students to food that is low in nutrient density (Kolodinsky et al., 2007). Observations imply that as students move off campus dietary choices improve. The purpose of this study was to ascertain differences

in dietary habits and quality in undergraduates at Elon University based on their residential environment. Participants (n=84; male 40; with equal representation from gender and year) were recruited via fliers and social media to attend a 20-minute evaluation session. Information on residential environment and diet was collected via surveys. The Diet Pattern Review (DPR) was used to evaluate the quality of diet. The DPR was developed at Wake Forest University for use with cardiac patients and has been shown to be an effective and simple tool. The DPR is a food frequency questionnaire that indicates adequacy of nutrient intake based on the following food groups: meats, dairy products, breads and cereals, and fruits and vegetables. This score, out of 100 (DPR_{total}), is adjusted to reflect the negative impact of non-nutritious foods consumed (DPR_{neg}) resulting in a net score ($DPR_{net} = DPR_{total} – DPR_{neg}$) that offers a rough estimate of dietary quality. No significant differences were found between on and off campus dwellers for the DPR. In addition there were no significant differences between males and females based on residential environment. However among off campus dwellers, females tended to report a smaller impact of non-nutritious foods compared to males (DPR_{neg} F = 17.42 $\pm$ 1.96; DPR_{neg} M = 26.76 $\pm$ 4.13; p = 0.071). DPR_{net} (DPR_{net} = 32.69 $\pm$ 15.35) was low for all undergraduates, suggesting poor dietary quality regardless of gender, year or living environment. Off campus dwellers were twice as likely to eat out as those living on campus, offering a potential explanation for the failure to observe the expected improvement in dietary quality among off campus residents.

HISTORY AND GEOGRAPHY

HOW MANY PEOPLE COULD GROW BIOINTENSIVE URBAN AGRICULTURE TECHNIQUES FEED IN BURLINGTON, NC?

Eric G. Lagueruela (Professor Ryan Kirk), Department of Geography and History

One of the central tenets of the local food movement is to expand sustainable food production in close proximity to the consumer population. However, there are large uncertainties of the scale potential or local food production, particularly in urban areas. In other words, how many people can we actually feed from growing food in our communities? In this study, we quantify the food caloric production potential of Burlington, NC, using Geographic Information Systems (GIS) and representative dietary needs. We used the 2011 National Land Cover Database to estimate the total greenspace area (i.e. maximum growing area), then developed a series of logic rules applied to parcel data to reduce that theoretical maximum growing area to feasible areas. We then analyzed soil quality at these sites using the Soil Survey Geographic Database to estimate yield rate using the sustainable Grow Biointensive agriculture system. Simultaneously, we estimated the per capita caloric and nutrient dietary needs using generalized food budgets based on this system. Finally, we developed a geospatial model to identify targeted areas for urban farming based on parcel greenspace area, zoning, and proximity to food pantries, community kitchens, and schools. By better understanding food production potential, this project aims to help to foster additional projects to alleviate food insecurities, promote food sovereignty, and strengthen the local community.

PROPAGANDA & THE NAZI WOMAN: ROLES, IMAGES & EXPECTATIONS OF NAZI WOMEN DURING THE NAZI ERA

Alyssa L. Baxter (Dr. David Crowe), Department of History and Geography

Women were a key target of Nazi propaganda during the Nazi era. To support Nazi party ideals that stemmed from Hitler's vision of Germany, propaganda was strategically created to manipulate women into fulfilling the German vision. Through a case study of propaganda from about 1933-45 and articles about the messages aimed at Nazi women, conclusions are drawn that propaganda was used to manipulate the women into the domestic sphere. This research aims to answer the question: What aspects of propaganda aided in the leverage of women as a manipulative tool for a political agenda? Women had specific guidelines and expectations to follow to create a pure race within a superior country. One of the major expectations was to create Aryan children with "racially pure" mothers. This was heavily incentivized and celebrated publicly with awards and recognitions that manipulated the women into working to achieve the German goal. Later, propaganda toward women shifted to encourage them to support the war effort because labor was needed. The sources used for this research include scholarly articles written about the Nazis' version of an "ideal woman," Hitler's vision and the behaviors of traditional Nazi women. By using scholarly sources, condensed online research articles and primary propaganda sources of print and film messages from sources including the United States Holocaust Memorial Museum archives, books and online sources. The conclusions I came to from this research came through a process of content analysis. I created categories that gleamed out of the scholarship then made a chart of about 20 characteristics I would look for in the propaganda images, and then coded about 20 propaganda images with these criteria. For example, I looked at the physical characteristics of the woman like if she had blonde hair, blue eyes, braided hair, uniform dress etc. Another example of this criteria was I looked at their role of the woman in the image such as if she was depicted as a mother, in a family setting, in the home etc. Overall, Nazi propaganda targeted toward women shows that through strategic messaging, goals can be achieved by creating a societal norm that is portrayed through all media messages. This ultimately shows how powerful conformity can be to a society.

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NO MONOPOLY ON HATRED; SLOVAK COLABORATION IN INSTITUTING THE HOLOCAUST

Chloe E. Eastwood (Dr. David M. Crowe), Department of History and Geography

My research centers around three questions. First, what was the legislative and social climate regarding linguistic and racial minorities in interwar Czechoslovakia? Secondly, once Slovakia was taken over by the Nazis and transformed into a separate state in 1939, to what extent did they change policies towards linguistic and racial minorities? Thirdly, and primarily; given the long-existing and newly instituted policies and attitudes towards linguistic and racial minorities in Slovakia (especially towards the Jews), to what degree was the Holocaust home-grown, and to what degree was it an import from Nazi Germany? This research is important because the history of the Holocaust in East European countries is a relatively new topic. Slovakia, like other communist states in the region, followed the Kremlin's position limiting the discussion of the Holocaust, particularly when it came to the question of the Jews. The research methodology for this project centers around an analysis of the existing scholarship on this topic. The primary sources for this research include but are not limited to testimonies of Czechs and Slovaks who lived during the timeframe in question, topical periodical publications from 1918-1945, and diary entries from the same time period. The major conclusion of this research is that while it is, at times, simple and convenient to blame German racism and policy coupled with its military might for the pan-European Holocaust, the truth is that such a conclusion defies the realities of history. While there were many attempts to modernize and westernize the policies and attitudes towards racial and linguistic minorities in interwar Czechoslovakia, the province of Slovakia remained more conservative and insular on these issues. Caught up in the struggle to define itself as a Slovak nation within Czechoslovakia, the province of Slovakia became hostile towards racial and linguistic minorities, especially towards the Jews. This fostered the mentality in Slovakia of Jewish "otherness" which existed prior to "independent" Slovakia's alliance and collaboration with Nazi Germany. In Slovakia, the hatred essential for its activist role in the Holocaust was already there; Nazi Germany merely provided the ways and means to enhance its role in the Shoah.

COMPARISON OF THE PLIGHT OF CHILDREN IN THE WARSAW AND LODZ GHETTOS FROM 1940-1945

Katharine I. Fredricksen (Dr. David M. Crowe), Department of History and Geography

This paper focuses on the Jewish children (up to age 16) living in the Warsaw and Lodz ghettos from 1940-1945 and their living conditions, resources (i.e. orphanages and children's hospitals), and general experiences. Both ghettos were established by the Nazis in 1940 and were the largest

in Nazi-occupied Poland during World War II. Though similar in size, they differed in the way they were administered by the Nazis and the local Judenrats. Differences in formal and informal leadership as well as strictness of regulations had a significant impact on the lives of the children. There is little scholarship on the plight of children in the ghettos because most of them died in the Holocaust. Consequently, my research is drawn from the small collections of memoirs and diaries of children who did survive, as well as the diaries, letters, papers, and memoirs of ghetto leaders (Janusz Korczak, Chaim Rumkowski), and Irena Sendler, a Polish Christian whom some regard as the Polish "Schindler." My work with these sources has enabled me to draw a more complete picture of the experiences of the children. In this paper I compare Warsaw and Lodz and show how there were drastic differences between them these differences altered how children experienced the ghettos. The resources and opportunities in Warsaw, like the variety of Jewish self-help organizations and the chance to escape via a sophisticated underground movement, impacted children differently than how the "salvation through labor" mentality of the Lodz ghetto impacted children. The emphasis on "salvation through labor" made it particularly difficult for children to survive because they were often not strong enough or old enough to be considered useful laborers in Lodz. Understanding the lives of children in the ghettos is crucial not only because it expands our knowledge of general conditions in the ghettos and because it gives us a fuller picture of the impact of the ghettos on the Jewish community, but also because it bears witness to the lives of the victims. The child victims of the Holocaust represent an entire lost generation that deserve to be remembered.

EDUCATION IN CHINA

Stephanie E. Gallagher (Dr. David Crowe), Department of History and Geography

China's education system is frequently criticized for being too demanding on students, but praised for its high-test scores. What began as a modernizing reform in post-Mao China soon became an elitist competition. Overtime, the educational leaders tried to reform the system in attempt to foster creativity, though this was far from successful. The relatively recent shift to a socialist market economy in China necessitated a population well-trained in math and science. However, in today's world of creative success, China now finds itself falling behind much of the industrialized world. If China's leaders wish to produce students with creative ability, they must successfully restructure the education system to highlight the importance of reading, writing, and critical thinking in their curriculum. My research, which is drawn from scholarly sources, relevant news articles, and historical content, underscores the evident flaws in the Chinese educational system. The emphasis on university entrance exams, such as the *Gaokao*, for example, places large amounts of stress on students and often leads to severe mental breakdowns. Students spend years preparing for the formidable *Gaokao* test, a process that makes the United States' SAT's look like child's play. These exams control a student's entire future; a low score essentially ruins the career prospects for students. A student's score on the *Gaokao* determines which university they will attend as well as their career path. Chinese students have little to no say in their future and it almost entirely depends on their score on the *Gaokao*. The comparison of the Chinese system to the United States' educational system is a topic frequently debated in the news today. Since they are two of the world's most important nations and competitors, it is important to note the drastic educational differences of both countries, and how all of this affects students, both academically and mentally. My research will show that the *Gaokao* puts students under severe stress that can sometimes have lifelong repercussions, some claim to endure nightmares years later. In conclusion, I think that China's

educational system requires considerable changes in order to generate the creativity they wish to produce in future generations.

A BATTLEFIELD MADE OF PAPER AND INK: THE ROLE OF NEWSPAPERS AS A FORUM FOR POLITICAL DEBATE DURING THE CAMPAIGN AGAINST SEXISM IN THE IRISH CONSTITUTION OF 1937

Julie C. Phillips (Dr. David Crowe), Department of History and Geography

In 1937, the Republic of Ireland was officially created with the ratification by referendum of the Irish Constitution. The Constitution was controversial, as it included language that emphasized sexist viewpoints and legalized gender discrimination. Ireland's fractured and sparse women's movement mounted a campaign against the Constitution's sexist language, using newspapers to reach the voting population. The supporters of the Constitution mounted a counter-campaign using the *Irish Press*, a prominent newspaper owned by Éamon de Valera, President of the Executive Council and creator of the Constitution. Though the women's campaign was ultimately unsuccessful and the Constitution still contains sexist language, their newspaper campaign was later credited as a major influence on the close result of the referendum. The following question guided this research: how did the Irish women's movement and their opponents use national newspapers as a forum for debate? The debate about sexist language in the Constitution continues today in Ireland, yet there has been little scholarly research about the controversy's history. There has also been no study on the role of newspapers in the referendum debate, despite the prominent role they had in contemporary Irish society. This research found that the women's movement used newspapers as a way to enter the public discourse while living in a culture that marginalized women, but were unsuccessful in their campaign because the Constitution's supporters were able to use the *Irish Press* to continually promote the Constitution and discredit any critics. This research was conducted via qualitative and quantitative primary source analysis. The primary sources were articles about women and the Constitution published in the three major national Irish newspapers from the two-month referendum campaign. The qualitative research focused on how newspapers were actively used to advocate voting against the Constitution and how the political supporters of the Constitution leaned on a state-supported newspaper to earn votes. The quantitative research was a content analysis of the articles, which focused on the quantity and bias of published articles about the conflict surrounding the Constitution. Articles were coded as being for/against the Constitution and for/against the women's campaign.

HANNAH HÖCH

Gia C Pineda (Dr. David Crowe), Department of History and Geography

Hannah Höch is known for her progressive works that illustrated her efforts to confront and discuss social and political issues during the Weimar Republic in Germany (1919-1933). As one of the codiscoverers of photomontage, she adapted this style to depict her opinions about the destruction caused by World War I, gender roles, race, and sexual identity. Although she was the

most prominent female in Berlin Dadaist movement, Höch is often overlooked because of her gender and subject matter. I have been using Dadaist texts to analyze her art such as Matthew Gale's *Dada & Surrealism*, though sources like these lack the depth needed to adequately explore the impact and variation of her work. From my research, I have discovered that most of her politically charged pieces, specifically about race and sexual orientation, were created after her time with the Dadaists, during the early rise of Nazi sentimintality in Germany, when racial integrity was deemed as the path to succeeding as a nation. Her works and ideas were distinctly unique though she is too often found in texts just detailing her early work with the Dadaists. Hannah Höch is well known, but only for her early pieces. On the other hand, her later works were just as radical and even predated serious issues and problems with the Nazi Regime. Höch continued to create works until her death in 1978. I want to open a discussion about her impact as an artist separated from that of the Berlin Dadaists. Despite her noteworthy works that commented on the changes in German society, Hannah Höch's gender, sexuality, and subject matter prevented her from being as well known as other German artists from the time.

HUMAN SERVICE STUDIES

TRAUMATIC BRAIN INJURIES AND CAMPUS LIFE: CREATING AND SUSTAINING A SUPPORTIVE CAMPUS ENVIRONMENT

Ashley D. Edwards (Dr. Rodney Parks), Department of Human Services Studies

Of the 5.3 million traumatic brain injuries (TBIs) sustained in the U.S. annually, 980,000 occur among young people ages 15 to 24 (Centers for Disease Control and Prevention [CDC], 2010). This population faces numerous challenges in transitioning from high school to higher education. TBIs vary widely in cause, severity, and after effects, often impacting communication, cognition, and learning. Though most institutions provide disabilities services, as many half of students with TBI fail to utilize them, and some campuses are poorly equipped to serve this population (Ruoff, J. 2013). Through semi-structured qualitative interviews, the researchers elicited narratives depicting experiences with disabilities services from five undergraduates with traumatic brain injuries. This study offers a glimpse into the experiences and perspectives of students with TBI by drawing on their firsthand narratives. The narratives provided by the participants afford a view into exactly what works and doesn't work in the realm of accommodations. In particular, the findings can help guide disabilities services staff and other higher education administrators to develop more effective resources and services to assist these students in completing their college degrees. The goal of this study is to offer recommendations that will enhance services for and better accommodate the needs of college students with TBI, both during their transition into college and throughout their college career. The interviews revealed several instances of services that could be improved to better serve this purpose. For example, John found that the "audio books" he received were of little if any actual assistance. John noted that although receiving actual audio books would have solved his problem, when he was given only the PDF reading software, he "might as well be reading [the books himself]." The problem here might be lack of funding, but it is far too commonly a lack of understanding on the part of the disabilities services staff. In conclusion, the research gained the insight of the students and their advice on ways to improve the services provided to better meet their needs. Through the present research we hope to help disabilities services offices identify solutions to these kinds of problems.

KNOWLEDGE AND SKILLS OF ELON STUDENTS SURROUNDING SEX TRAFFICKING AND LABOR EXPLOITATION ISSUES: IMPLICATIONS FOR HUMAN TRAFFICKING EDUCATION AND PREVENTION AMONG COLLEGE AND UNIVERSITY STUDENTS

Georgia E. Lee (Dr. Carmen Monico), Department of Human Service Studies

While human trafficking is becoming increasingly recognized as a critical issue on various levels, little research exists that measures the understanding and perceptions of university students about the issue. Previous research has emphasized the need for increased education for the general public about human trafficking (Logan, Walker, & Hunt, 2009). Additionally, research exploring the perceptions and understanding of university students surrounding sexual violence, a topic linked to human trafficking, has shown its high prevalence on university campuses, the strong influence of students' perceptions on their behavior, and the positive effects that education about sexual violence can have on university students' willingness to intervene and address this issue (Prospero & Vohra-Gupta, 2007; Banyard, 2008; McMahon, 2010). These previous findings can help to inform the role of education and skill-building for university students in working to prevent and combat human trafficking. In order to address this topic and determine its implications, this research aims to measure the level of university students' knowledge and skills surrounding human trafficking issues. For the methodology of this research, university student participants completed a quantitative online questionnaire that evaluated their knowledge, skills, behavior, and beliefs surrounding human trafficking issues. The research found that university students have mainly low levels of knowledge and skills related to the definition, prevalence, identification, and other topics related to human trafficking, with exceptional instances of medium levels. These results emphasize the need for increased understanding and education about human trafficking issues among university students. The results also showed students' needs for greater knowledge about the incidence and prevalence of human trafficking on the local level, more effective training on human trafficking identification and referral skills, and a better understanding of what actions they can take to support businesses and organizations that work to fight human trafficking. By better understanding the current beliefs, knowledge, and behavior of this population, the education of university students can be appropriately influenced, helping this population to be more effective actors in the prevention and elimination of human trafficking, from local to global levels.

"CONTROL YOUR DIABETES, DON'T LET IT CONTROL YOU": COLLEGE EXPERIENCES AMONG STUDENTS WITH TYPE 1 DIABETES.

Bailey E. Nugent (Dr. Cynthia Fair), Department of Human Services Studies

The transition from home to college is challenging for many students, especially those with type 1 diabetes (T1D). Little is known about the role diabetes plays in the lives of U.S. college students, nor the strategies they use to manage their condition in an academic environment. In fact, T1D college students are often cited as "a forgotten group" (Balfe, 2009). Studies claim such students participate in unhealthy behaviors like allowing blood glucose to "run high"

(Wilson, 2010, p. 26), binge drinking, and misusing insulin and food (Rasmussen, Ward, Jenkins, King & Dunning, 2011; Hill, Gingras & Gucciardi, 2013; Wilson, 2010; Balfe, 2007; Balfe, 2009; Bryden, Peveler, Stein, Neil, Mayou & Dunger, 2001). These behaviors allow individuals to feel like "normal" students but also highlight the lifestyle challenges of university life and diabetes (Balfe, 2007). The purpose of this qualitative study is to explore the challenges and resources available to college students with T1D and identify strategies that may facilitate their college transition. Semi-structured interviews were conducted with ten college students living with T1D (mean age, 19.9 years, seven females). Interview questions concentrated on their challenges with T1D, advice for others in similar situations, and suggestions for roommates. Interviews were transcribed and emergent themes identified. Reported challenges included varying schedules, limited access to and information about the nature and number of carbohydrates in dining hall food and feelings of isolation. Advice centered on the importance of consistent adherence to blood glucose testing routines and taking supplies such as extra food and/or insulin to class or other functions. Participants emphasized their illness was only one aspect of their lives and did not define them as a person. Participants also indicated that college campuses should improve diabetes awareness and expand their in-place programs. The advice for roommates centered on the importance of understanding how to respond to high and low glucose levels and general knowledge of T1D. With this new information, students, university officials, parents, and roommates can more readily support those living with T1D and create an environment that encourages academic excellence and health of T1D college students.

MENTORS IN VIOLENCE PREVENTION: AWARENESS VS. UNDERSTANDING

Pari T. Shah (Dr. Beth Warner), Department of Human Service Studies

Finding the best way to educate today's youth on the subject of intimate partner and family violence is a challenging task, and one that researchers and practionners continue to explore. Today, new educational techniques involve teaching students to become leaders in reporting violence when witnessed. The Mentors in Violence Prevention (MVP) Model is a gender violence, bullying, and school violence prevention approach that encourages young men and women from all socioeconomic, racial and ethnic backgrounds to take on leadership roles in their schools and communities. The trainings encourage an innovative "bystander" model that educates students about when to intervene and the importance of reporting violence (Banyard, 2011). This research looked at whether the training strategies in the Mentors in Violence Prevention program were effective in increasing both awareness and understanding about types of violence and leadership in prevention for teenagers entering high school. Since 2007, Elon University students have conducted MVP training for 9th grade students in Alamance County. As a part of the training, students are given a pre- and post-assessment that measures their awareness and understanding of intimate partner and family violence prevention. On the pre- and post-assessments, students are asked to respond to statements related to violence, and they are asked to mark whether they, "agree", "disagree", or are "unsure" about the statement. On the post-assessment, in addition to repeating the pre-assessment questions, they are also asked open ended questions that require the students to reflect on the training session in their own words. Previous studies testing the most effective teaching methods for intimate partner violence education found that students became more aware, but did not gain a full understanding of the subject in these types of training programs (Fox, Hale, & Gadd, 2014). The results of this study revealed that on some of the topics students achieved both awareness and understanding. However, on other questions, such as blaming the victim, students did not demonstrate understanding. Additional findings and discussion of the results will be presented in the poster session.

CROSS CULTURAL EMPATHY: THE IMPACT OF A PLAY THERAPY SERVICE LEARNING COURSE

Natalie K. Sipala (Dr. Judy Esposito), Department of Human Service Studies

This presentation focuses on a study of undergraduates' cross-cultural empathy as affected by learning about play therapy. Child-centered play therapy skills include communicating empathy, maintaining a nonjudgmental stance, and allowing the child to lead. The purpose of this study was to determine whether undergraduates would show an increase in cross-cultural empathy as they practiced their newly-learned child-centered play therapy skills with children and families at local Head Start Centers. 19 Students submitted written responses to cross-cultural vignettes, at the beginning and end of the semester. These were coded for indications of cross-cultural empathy. Preliminary results revealed the following changes in student responses after learning child-centered play therapy skills:

*More refusal to pass judgment
*More understanding of the subject's thoughts or feelings
*More references to the subject's culture
*Fewer "should have" responses (saying what the subject should have done or felt)
*More attempts to understand the subject's circumstances

This study lends support for practicing child-centered play therapy as a possible means for developing cross-cultural empathy.

INTERNATIONAL STUDIES

WINNING THE GAMES: MEDIA FRAMING IN THE OLYMPIC BID PROCESS

Kathleen M. Caler (Dr. Roselle), Department of International Studies and School of Communications

Every two years the world gathers to see some of the finest athletes represent their respective countries at the Summer and Winter Olympic Games. While competing at the Games is no easy task, selecting the host city for each Games, is not easy either. How does the International Olympic Committee select just one city? There is no easy answer for that question and this study aims to determine what role the media may play in that decision. There are a number of websites that predict which city the IOC will select, however they are not always accurate. For the purposes of this study, GamesBids.com has been used as a predictor for the winning city for the Olympics. Gamesbids.com considers a number of factors including the economy and political atmosphere to assign numerical values to each city to predict the winner. For this study, three instances of a Gamesbids.com incorrect prediction have been selected as case studies. Coding software is being used to examine newswire and newspaper articles found on the Newspaper Source Plus database during a fixed time period for each case, using the search terms "Olympic bid" and the name of the city. The sources are coded for factors similar to those of GamesBids.com (political, economic, environmental, etc.) to determine whether media framing might help explain the incorrect predictions. So far, findings suggest that winning host cities have far more coverage than predicted winners and that media framing helps to explain why algorithmic predictions are not always correct.

PERCEPTIONS OF HAITIAN IMMIGRATION AND LABOR IN THE DOMINICAN REPUBLIC FROM THE 1990S TO TODAY

Katherine A. Shafer (Dr. Michael Matthews), Department of International Studies

The Dominican and Haitian national identities have been closely tied throughout their history on the island of Hispaniola. After the island gained independence from Europe, the Dominicans of Santo-Domingo gained their independence from Haiti. The Dominican Republic began to utilize its abundant natural resources and the availability of Haitian labor to become a more prosperous nation than its island counterpart. Even dictator Rafael Trujillo, in power from 1930-1961 and vehemently anti-Haitian, recognized a clear economic need for Haitian labor and facilitated government contracts to secure it. Today, tensions continue as Haiti deals with natural disasters and economic troubles and the Dominican Republic profits from the sugar, coffee, tobacco, cacao, and tourism industries. Dominican politicians simultaneously encourage the use of cheap Haitian labor in Dominican industries and denounce Haitian immigration, blaming Haitian-Dominicans for many of the country's economic woes. This project explores the diverse domestic and international perceptions of Haitian immigration and labor in the Dominican Republic from the 1990s to today. In recent years, with a heightened awareness of human rights issues, international organizations and governments have become more defensive of the rights of Haitians and Haitian-Dominicans in the Dominican Republic. The Dominican government, at the same time, defends anti-Haitian immigration legislation and the national media has been supportive of its policies, a development that has drawn accusations of press censorship. This research examines the publications of international organizations, foreign governments, international and Dominican periodicals and scholarship, and the Dominican government to assess the perceptions of Haitian immigration and labor in the Dominican Republic. The findings show a clear distinction between the perspectives of international and domestic policy- and opinion-makers. The recent implications of these perceptions include a rising domestic hostility to an influx of Haitian involvement and contributions to Dominican society and industry that has prompted a growing international human rights response.

EUROZONE CRISIS AND THE CATALAN INDEPENDENCE MOVEMENT—WHAT'S THE CONNECTION?

Meaghan Walsh (Dr. Jason Kirk), Department of International Studies

The impacts of the Eurozone Crisis are still being felt throughout Europe, especially in Portugal, Ireland, Greece, and Spain. This project will direct its focus toward Spain, and more specifically Catalonia. This economically dynamic region, in Spain's northeast, is an officially recognized "nationality" and one of 17 Autonomous Communities under the 1978 Spanish Constitution, which established a formally unitary (not federal) but nevertheless highly decentralized and asymmetrical Spanish state. A strong nationalism and a desire for greater autonomy long have been defining characteristics of the Catalan people. However, in recent years, there has been a dramatic resurgence of the Catalan independence movement coinciding with the onset of Eurozone Crisis. Is this surge for independence simply a coincidental correlate of the ongoing economic crisis that still haunts much of Europe, or is there a causal connection between the recent economic context and the new Catalan nationalism? The goal of this project is to apply a "cultural economy" perspective, which posits that culture and economy are co-constructed for particular political ends, to the Catalan case. The paper argues that the Eurozone crisis, the breakdown of fiscal dialogue between Madrid and Catalonia, and electoral incentives for

regional politicians all have converged to produce the new push for Catalan Independence; each of these elements has been necessary, but not sufficient to account for the outcome.

MARKETING

HOW TO DRIVE WEBSTIE TRAFFIC AND ENCOURAGE ONLINE PURCHASES: AN EMPIRICAL EXAMINATION OF ONLINE ENVIRONMENT IN THE APPAREL INDUSTRY

Ana Preciado (Dr. Kacy Kim), Department of Marketing

The declining cost of computers, the rise of disposable income and the increase of Internet usage, are generating a trending migration of consumer practices from physical stores to online retailing. According to The National Retail Federation, this number reached 140 million consumers in 2013 (IBISWorld). IBISWorld indicates that two prominent causes for the transition include the low prices found on the web, and the added value that its convenience generates. However, as companies adapt to the changing environment, they have started facing new challenges pertaining consumer engagement. Since previous studies report that feelings of uncertainty towards online purchases are common among consumers, and that browsing enjoyment diminishes perceived risk, online retailers could differentiate themselves by crafting an appealing website environment that meets the visitor's expectations of quality in order to decrease uncertainty, foster their loyalty, and encourage purchases. However, this leads to a new question: what attributes of an online environment do the majority of consumers consider to be appealing? Using apparel industry empirical data, this study conducts a one-way ANOVA analysis on the effects that the independent variables (1) homepage symmetry and (2) image concreteness have on the dependent variables (1) bounce rate and (2) daily page views. The term image concreteness refers to pictures where the product is portrayed in a conventional setting as opposed to an artificial white background. A sample of 150 websites was gathered from the top performer of this industry, in Alexa.com, along with their traffic data. The sample was judged by two coders with 90% inter-reliability. In the process, they were categorized into two and three levels, respectively, for each of their IV's (ex. Symmetric, asymmetric; concrete images, non-concrete images, both). Our results found that the homepage symmetry of a website has a significant correlation with its bounce rate. However, it does not affect the daily page views by visitors. On the other hand, image concreteness did not report a significant correlation with neither of the Dependent Variables.

MATHEMATICS AND STATISTICS

PROPERTIES OF SELF-AVOIDING RANDOM WALKS IN TWO AND THREE-DIMENSIONS

Elise, C, Pippert (Dr. Jeff Clark), Department of Mathematics

A random walk is a mathematical model of a path that consists of a succession of random steps. A self-avoiding random walk is a path that does not visit the same point more than once. This presentation explores the properties of self-avoiding random walks in both two and three-

dimensions. The movement and properties of self-avoiding random walks were explored through simulations in the programming language *Python*. One property that was analyzed was, the average number of steps the walk took before it had nowhere else to turn. This required looking at the average number of steps until the next step was a boundary or a point where the walk had already visited. Other properties that were analyzed were the minimum number of steps and the maximum number of steps that the walk took. The variance of the data collected was analyzed with respect to increasing grid size as well. It was found that in three-dimensions, the contingency of being self-avoiding made no impact and in two-dimensions, the number of steps increased until it hit a plateau, limiting to a value of around 70 steps. At a certain point, increasing the grid size did not allow the random walk to increase in the average number of steps that it could take.

DERIVATIVE SIGN PATTERNS FOR INFINTIELY DIFFERNTIABLE FUNCTIONS IN THREE-DIMENSIONS

Madeline M. Edwards (Dr. Jeffrey Clark), Department of Mathematics and Statistics

A derivative sign pattern (DSP) is a sequence of positive and negative signs that represent the signs of a function and its derivatives over its do- main. Some infinitely differentiable functions have sign patterns, but not all. Functions that fall into this category are trigonometric functions, exponential functions, logarithmic functions, and possibly others. Of these, only exponential functions have sign patterns; the others take different signs on their domains. As seen in Calculus I, certain functions can be differentiated without eventually becoming 0. In the one-dimensional case studied by Clark, e^x is an example of a function that has an infinite number of derivatives. In the domain of all real numbers, **R**, Clark determined the DSPs and found example functions to match the pattern. In **R**, Clark found only four valid sign patterns, all positives, positive and negative signs alternating, and their negations. In the case of **R**, a function that is infinitely differentiable that has a sign pattern can be determined from the original function and the first derivative. Schilling expanded from the one-dimensional case to the two-dimensional case for the entire plane. In the domain of $\mathbf{R} \times \mathbf{R}$ with ordered pairs, Schilling found eight possible DSPs. Building on Schilling's Derivative Sign Pattern Theorem, the expansion to the three-dimensional case is analyzed. The specific case of interest in three-dimensions is ordered triples of real numbers, $\mathbf{R} \times \mathbf{R} \times \mathbf{R}$. From Schilling's research of matrix possibilities in two-dimensions, analysis of what is possible in three-dimensions can be constructed. In the three-dimensional case, there is interesting geometry among the derivative sign patterns with only a finite number of possible combinations found in $\mathbf{R} \times \mathbf{R} \times \mathbf{R}$. While applications of DSPs in three-dimensions are limited, the gained understanding of how functions and derivatives work within a given domain is the greater purpose to this research.

A NEW ALGORITHM FOR GALOIS GROUPS OF QUINTIC POLYNOMIALS

Robin B. French (Dr. Chad Awtrey), Department of Mathematics

Finding solutions of polynomial equations is a central problem in mathematics. Of particular importance is the ability to solve a polynomial ``by radicals"; i.e., using only the coefficients of the polynomial, the four basic arithmetic operations (addition, subtraction, multiplication, division), and roots (square roots, cube roots, etc.). Polynomials of degree four or less have been shown to be solvable by radicals, while the same is not true for all degree five polynomials. How do we determine which degree five polynomials are solvable by radicals? To answer this

question, we study an important object that is associated with every polynomial. This object, named after 19th century mathematician Evariste Galois, is known as the polynomial's Galois group. The characteristics of the Galois group encode arithmetic information regarding its corresponding polynomial, including whether or not the polynomial is solvable by radicals. In this talk , we will discuss a new algorithm for determining the Galois group of a degree five polynomial, which improves upon previous work of mathematicians D. Dummit and H. Cohen. For a given degree five polynomial, our algorithm constructs a related degree 24 polynomial. We will demonstrate that the factors of this degree 24 polynomial uniquely determine the Galois group of the corresponding degree five polynomial.

LINEAR ALGEBRA POSSIBILITIES IN THE COMMON CORE CURRICULUM

Amy J. Heaton (Dr. Arangala), Department of Mathematics

Linear Algebra is a math content area which is usually reserved for undergraduate, but in recent years high school students have become increasingly interested in the subject. However, the public school sector rarely offers courses; rather, students have to go to local colleges or universities. This paper outlines a proposed unit in which the introductory linear algebra concepts are explained within the Common Core standards. In reality, there are actually several standards which relate directly to the fundamental concepts of linear algebra; the key is putting them in a different perspective to make the transfer to matrices and eigenvectors more straightforward. For example, algebra standards in the common core under the domain "Reasoning with Equations and Inequalities" include many expectations that could be easily transferred to a linear algebra unit. The culminating project for students in this unit would be related to the algorithm used by Google PageRank to determine the most useful sites for a search. This real-life application will engage students and show them the importance of higher mathematics in today's society.

DEGREE SIX POLYNOMIALS AND THEIR SOLVABILITY BY RADICALS

Peter L Jakes (Dr. Chad Awtrey), Department of Mathematics and Statistics

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 "solvable by radicals," which means a function can be solved by only knowing its coefficients, square and other roots and the four basic operations. As a result, a method was created in the 20^{th} century 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 polynomials. By using computer software, the Galois group of a degree six polynomial can be determined by only using two resolvent polynomials, 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. Further research can explore higher degree polynomials as well as reducible polynomials, which are polynomials that can be factored, as the current method is only viable for irreducible polynomials.

A CASE STUDY OF PROJECT-BASED LEARNING IN SECONDARY MATHEMATICS CLASSROOMS

Sarah C Zierhoffer (Professor Jan Mays), Department of Mathematics and Statistics

Project-based learning has gained popularity recently because of its nature as an engaging method of teaching, while still pushing students to a level of mastery that allows them to succeed in both standards-based assessments and real-world applications (Boss, 2012). According to Buck Institute of Education, PBL is "a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to a complex question, problem, or challenge." Studies have shown that students engaged in a project-based curriculum fare as well as their traditionally educated counterparts on standardized assessments, and far surpass them in real-world applications (Boaler, 1998). The process by which students learn in a project-based learning classroom is very different in that teachers do not act as the sage on the stage, but as a guide in learning and a facilitator for students. Students must actively construct and find the knowledge they need in order to complete a project or problem that they have ideally chosen or created because it is of interest to them. Students are constantly pushing themselves just beyond their understanding and maximize their ability to learn. In this research, I have conducted a case study focusing on a North Carolina project-based learning classroom in order to understand the nuances of this methodology of teaching. My research addresses the question of what classroom practices lead to highly-effective project-based learning. This information may be leveraged in the future to create a more hybrid method of teaching—one that would blend project-based learning and traditional education—to maximize benefits and minimize student frustration. Through my analysis of observation notes and interview transcripts, several major themes emerged. The areas of interest we identified were the importance of having students resolve their own mistakes, activating prior knowledge before attempting a task, and formulating problems that provide multiple entry points and opportunities for creative problem-solving approaches.

MUSIC

SONGWRITING AND ARRANGING IN STYLES OF POPULAR MUSIC

Brooke E. Jenkins (Professor Stevenson), Department of Music

This presentation will outline the stylistic analysis of ten albums in varying subgenres of popular music and the resulting creation of original songs and arrangements. Through aural analysis and reference to written resources, the study examines albums from artists as diverse as Taylor Swift, Gorillaz, and The Beach Boys to find patterns in the form, harmony, lyrics, melody, arrangement, and production of each. The creative component of the project uses these recurring attributes to shape the songwriting, arrangement, and production of one original song per album analyzed. The study finds that each album indeed contains definite patterns in the facets of songwriting and arrangement investigated. These findings have been applied to the creation of ten original songs, each arranged with stylistically appropriate vocal and instrumental parts and produced with the most prominent effects and tonal aesthetics of the relevant style. The research contributes to the burgeoning field of musicological study in popular music by discerning the particular combination of elements that constitutes each of the styles examined. The project

further presents a diverse collection of original work, in which each piece of music combines characteristics of one album studied with its own distinct components. The presentation will illustrate the analytical and creative processes through examples of specific patterns found and their applications within the corresponding songs and arrangements.

¡QUE VIVA EL RITMO!: EXPLORING AFRO-CUBAN TRADITIONS IN CONTEMPORARY CUBAN MUSIC

Nicole E Payne (Dr. Victoria Fischer Faw), Department of Music

From its earliest beginnings in African rhythmic traditions and Spanish musical styles, Cuban music has evolved and grown into a unique musical experience. The transculturation process continued throughout the history of Cuban music, manifesting itself in various ways. In the 1990s the newest form of Cuban music appeared. As influences from the growing American hip-hop scene began to infiltrate Cuba, a vibrant Cuban rap scene emerged, created by racially diverse musicians. Because of the limited access to the kinds of technology and equipment that American hip-hop artists were employing, Cuban rappers used traditional and easily accessible instruments, primarily the same *batá* drums and African instruments that had been used for centuries, creating a stylistically unique hip-hop sound. In Cuba, music has long served as the voice of the people. Through energetic popular support for rap as an art form in Cuba, along with the growing international fame of groups such as *Orishas* and *Gente d Zona*, Cubans have been able to express racial and social issues in their society in ways that would not otherwise be possible, while maintaining centuries of musical traditions. This study will examine how contemporary Cuban hip-hop (*reggaeton)* has combined social justice with Cuba's unique musical traditions, and how it is the modern representation of centuries of transculturation. Through the isolation of its musical roots and development and a discussion of its social importance through specific musical examples, this study will demonstrate the connections between Cuba's rich musical roots and contemporary Cuban music.

PERFORMING ARTS

LINGUA VITAE: A DRAMATIC EXPLORATION OF LANGUAGE EXTINCTION

Zane Phillips (Professor Fred Rubeck), Department of Performing Arts

What would you do if you were the last person on Earth to speak your people's language? This question spurred me to examine how I might add my voice to the crisis of language endangerment. Many linguists predict that, of Earth's estimated 7,000 languages, around half will disappear in the next 100 years – and with them, much of the knowledge and culture these languages hold. While the numbers carry with them an alarmist tone, I want to fully explore the human side of the loss of linguistic diversity, and the incredible amount of emotions that this last speaker must bear. An original play in one act, *Living Voices* examines these personal repercussions, as one young man finds himself the last speaker of the language of his ancestors. His indifference towards its preservation, however, stands in stark contrast to the linguist devoted to saving the language from a seemingly inevitable demise. When these two men and their personal worldviews collide, they reveal the complexities behind each side, and the reasons why this issue deserves more exposure. Drawing upon research into modern language preservation efforts and methods, Native American languages of the Pacific Northwest, and the

art of crafting a cohesive playscript, *Living Voices* encompasses the struggle of those experiencing the effects of linguistic imperialism, and gives their stories a voice through a theatrical narrative.

THEY CAN'T TAKE THAT AWAY FROM ME: STORIES FROM AN UNFORGETTABLE GENERATION

Jake L Sokoloff (Professor Jane Wellford), Department of Performing Arts

Everyone deserves to have their stories heard and their lives celebrated. How can performance and storytelling be used to deeply affect, make a difference, and affirm meaning in the lives of those that feel voiceless? What can be done to recover the lost art of communication through conversation? "They Can't Take That Away From Me: Stories From an Unforgettable Generation" is a collection of stories and treasured memories set to popular music from the 1920's through the 1940's. This performance piece tells the story of a golden generation, mostly octogenarians, through music and text. It is a celebration of life and love, giving voice to an important, often voiceless, and truly unforgettable generation. These individuals are given the opportunity to tell their extraordinary stories, relating in the common human experiences and sharing invaluable life lessons. The script of this piece was created directly from a series of interviews done with residents living at The Village at Brookwood in Burlington, NC. The residents were invited to listen and respond to a collection of both social music and music theatre songs from the golden era, followed by an interview process that was used as the initial impetus of conversations about the life stories and treasured memories of the participants. The music was essential, acting as the spark for narrative and used as a way to access memories that may have been lost or forgotten. The interviews were collected and combined into a final performance piece of songs and narrative performed by the initial interviewees and other residents of the facility. The final presentation was shared on two different evenings before packed audiences of friends and family. This project exposed the ways in which art can have a greater and more profound effect on individuals, and gave voice and meaning to a generation often overlooked and undervalued. It also worked to expose the commonalities all human beings share by connecting through music, which knows no bounds.

DRAMA WORKSHOPS FOR YOUTH

Danielle L. Basirico (Professor Jane Wellford), Department of Performing Arts

As a Theatrical Design and Production student, I wanted to find a way to combine my passion for theatre with my love of human services, especially the population of middle school youth. After much research on drama with youth, I learned drama activities for youth improve children's communication skills, raise their self-confidence, and increase their expression abilities. Originally, I planned a series of youth workshops focusing on learning these skills where a series of workshops would occur, ending with a final children's performance for family and friends. After a few weeks of carrying out the first series of workshops, my mentor and I observed problems with the model due to irregular attendance of the children. Since the attendees of this first series of workshops were youth in an afterschool program, different children came on different days and the drama workshops were only offered one day a week for 6 weeks. Therefore there was an inconsistency in the learning of the skills due to irregular attendance of the same children. Since the workshops met only once a week, it was hard to create a series of consistent classes where there was regular and progressive order to the same

students. The second problem was the performance held at the end of the workshops. The final performance was shorter than expected, but nicely presented by the children who were the most consistent attendees of the drama workshops. The new strategy for the next semester's workshops was to avoid inconsistent attendance issues by changing the strategy. I created two 90-minute drama workshops, each to be presented at a different location in Burlington, NC. I decided to eliminate the idea of an ending performance and focus on quality teaching of the workshops. Without the focus of a performance, I was able to focus on the original three goals: communication skills, creative expression, and self-confidence. A structured 90-minute workshop of seven different drama activities was shared with 20 middle school children at the Burlington YMCA and was a complete success. With the assistance of four other Elon students, this first drama workshop of this semester was an improved strategy. The second of the 90-minute children's drama workshops will occur towards the end of this spring

COSTUMING A HISTORICAL MUSICAL IN THE MODERN AGE

Claire C Bishop (Professor Jack Smith), Department of Performing Arts

My project sought to seek out the most advantageous and effective way to design a historically accurate musical. This question interested me because there are many ways to research historical dress and with evolving technology it is hard to keep up with every new method. By discovering these new methods and utilizing them in my project it was easier to keep my historical research together and find new information about the time period. There were many ways I sought to answer the question I posed. First, I asked if I would be able to assistant costume design *Titanic;* a historical musical that was performed at Elon in October of 2014. Being a part of this show helped me to test my methods and apply them to a tangible presentation. Secondly, I looked at what methods are most commonly used in researching a historically accurate show. I concluded that books, old photographs and first-person accounts are most useful in putting together an accurate representation of the time period. Lastly, I researched new methods costume designers use to research and improved ways they keep their research organized. I found that the newest, and least utilized tool, used by designers to keep their research organized is the online site called Pinterest. Pinterest is a tool used to keep pictures from across the Internet organized in a single space, or board as they are called. For my *Titanic* research I chose to create different boards for each of the immigrant nations in the third class, Irish, German etcetera. In my findings, I discovered that the most advantageous way to design a historically accurate musical would be to combine both the old and new methods. The older methods of finding accurate dress with the new ways to organize the show research create a solid foundation to design the musical. Despite the ever-evolving approaches for finding historical representations of dress, I have shown that the tried and true ways will live on alongside the new methods.

THE EFFECT OF SOUND DESIGN ON THEATRICAL PRODUCTIONS CASE STUDY: *FROZEN* BY BRYONY LAVERY

Evan C. Lutvak (Prof. Jack Smith), Department of Performing Arts

Though the case study play *Frozen* by Bryony Lavery, sound elements created an environment not only literally, but also abstractly, exemplifying the emotional and psychological states of the play's characters. Understanding the void that a lack of sound creates, when applied to theatrical production, is a key piece in designing elements that exists in a world with which we have already been familiarized. This production used the comparison of diagetic and nondiagetic

sound to amplify the characters misunderstanding of their surroundings and lack of connection to one another. This mix of diagetic audio (sounds that exist within the world that the characters hear and understand, such as traffic) and nondiagetic audio (sounds that exist outside the world that the characters are not aware of, such as musical soundtracks and emotional sound cues) allow the audience the opportunity to listen in on the character's thoughts and feelings, as well as experience their situations first hand. Along with character understanding, sound was able to give substance to the production's constant presence of projections. This theatrical element was crucial in the productions design and helped to integrate sound and technology into the world of the characters. Together with projections, this study navigated the creative process, worked with the digital software Qlab, observed rehearsals, interviewed actors and designers, and resulted in performances in front of a live audience which gathered data from those viewers.

THE EFFECT OF PROJECTIONS ON THEATRICAL PRODUCTIONS CASE STUDY: *FROZEN* BY BRYONY LAVERY

Morgan P. Mayer (Prof. Jack Smith), Department of Performing Arts

The use of projections is a new technical production element making its way onto the theatrical stage; creating an entire artistic realm only just now being discovered through design and production teams internationally. While some believe that this new technology will upset the integrity of the artists on stage and become a distraction for the audience, others feel that by adding this fresh element to an otherwise relatively unchanged theatrical approach, younger generations will now be inspired to attend productions. Projection are able to create more than just a mere spectacle, they are a way to bring life to staged designs, and invite the audience to have a more connected experience with the story that the actors are telling. In order to research how projections are being used in modern theatrical productions, the case study *Frozen* by Bryony Lavery was tracked through design concept, actor rehearsal and performance, and audience reaction, following the design of choreographed actors and their timed interactions with full stage pre-recorded projected visuals. This projection design will be presented at the 2015 South Eastern Theater Conference in the Undergraduate Design Competition. This study navigated the creative process, worked with the digital software Qlab, observed rehearsals, interviewed actors and designers, and finally implemented projections into the production for performance in front of a live audience and gathered data from those viewers. The result was full documentation of a projection design's ability to amplify a theatrical production and its effects on audience member's overall theatrical experience.

BRINGING THE BARRIO TO THE BUBBLE: USING DRAMATURGY TO BUILD ACTOR AND AUDIENCE AWARENESS IN "IN THE HEIGHTS"

Allison A. Pichowicz (Dr. Susanne Shawyer and Dr. Scott Proudfit), Department of Performing Arts and Department of English

A dramaturg conducts relevant historical/cultural research for productions of plays or musicals. I served as the dramaturg for Elon's Winter Term production of Lin Manuel-Miranda's musical "In the Heights". The show is about a small community within the Washington Heights neighborhood in New York City that struggles with thriving in America while still staying true to their cultural and ethnic heritages. My question as dramaturg was how I could make a musical so situated in an inner-city working-class Latino community relevant to the Elon community. I approached this problem by creating an extensive research packet for the actors and engagement

activities for the audience. The actor packet contained background information regarding specific aspects of the script and larger thematic ideas. For example, I created a Google Map with every location mentioned in the show and compiled a glossary of unfamiliar slang words or Spanish phrases mentioned in the script. I supplemented these with short essays on issues addressed in the musical: Dominican Republic, Puerto Rican, Cuban, and Chilean heritages, first-generation college students, and Latino businesses. For the audience, I created a lobby display with photographs I had taken in Washington Heights and an interactive graffiti wall. Next to the graffiti wall were markers and a list of prompts relevant to the show: for example, "What does home mean to you?" I chose a graffiti wall because graffiti is prominent in the landscape of Washington Heights and this was a way for the audience to engage with themes from the show. Before the last performance, I gave a pre-show talk on how the show's overarching messages of "home" and "identity" were applicable to the Elon community. I found that highlighting universal themes such as "home" and "heritage" while supplementing them with unfamiliar ideas such as the landscape of Washington Heights was most effective in getting the actors and audience to connect with the production.

PHILOSOPHY

REIMAGINING DIVERSITY: TOWARD A MORE ASPIRATIONAL ALTERNATIVE IN HIGHER EDUCATION

Claire A. Lockard (Dr. Anthony Weston), Department of Philosophy

This research examines dominant discourses of diversity in higher education and aims to develop a new, more creative and optimistic conceptualization of diversity. Many diversity advocates and practitioners concerned with these issues acknowledge that they do not have adequate language to express the aspirational nature of their work (Ahmed, 2006, p. 751) and that they must be more creative with their efforts (Hoag, 2008, p. 18). Drawn from an ongoing Lumen/Honors project, this presentation will focus on the following question: How might today's diversity initiatives be re-designed and expanded to create better universities? My project grounds itself in the literature of diversity in higher education and "provisional utopian," imaginative methodologies. In this presentation, I will illustrate some of this imaginative work. I will begin by reviewing a selection of the literature of diversity in higher education, which will allow me to provide a detailed definition of diversity and distinguish between its connotative definition and the more optimistic definition universities often adopt instead. I will then present some possibilities for transformation, citing recent progressive policy changes at various univerisities and suggesting ways that these initiatives might go even further towards the optimistic, utopian goals of diversity practitioners. The policy initiatives that I describe will include the University of Vermont's recent recognition of a third gender, as well as other policies about which I learned during a set of university visits conducted over spring break of 2015. I will use these examples to argue that an understanding of identity fluidity might reframe the conversation around diversity into one that better matches its connotative definition.

PHYSICS

SUPERPARAMAGNETIC SILICONE MICROSPHERES FOR APPLICATIONS IN BIOTECHNOLOGY

David T. Han (Dr. Benjamin A. Evans), Department of Physics

Magnetic microbeads are used in a wide variety of applications within the biophysics community, including magnetic separations, microscale force spectroscopy, or biochemical testing for the presence of certain molecuels. In addition, they show promise in targeted hyperthermia and drug delivery applications, such as in the treatment of cancerous tumors. For most purposes, a high magnetic content is of primary importance.
We present here a bottom-up approach for fabricating magnetic beads that allows for large magnetic forces proportional to bead volume. We begin with a high concentration of magnetic-nanoparticle content and a silicone-polymer composite, containing as much as 50% wt. nanoparticles, which is subsequently formed into beads through cross-linking. The resulting magnetic beads contain magnetic content throughout their volume. In addition, our beads exhibit minimal autofluorescence, or natural emission of light when exposed to light, relative to standard polystyrene spheres. This is particularly helpful in sensitive fluorescence-based assays, in which autofluorescence would otherwise obscure the signal.To measure magnetic forces, we pulled magnetic beads of varying diameter through a viscous fluid using a fixed magnetic field geometry. Calculations of fluid drag forcesobtained via video tracking software allowed us to determine applied magnetic forces on each bead. Our data shows that magnetic forces on our microbeads compare favorably with leading commercial microbeads of similar diameters. In addition, we are able to produce spherical beads in sizes ranging from 0.5 to 50 microns, enabling forces in the nano-Newton or even micro-Newton range in the larger sizes when paired with typical magnetic tweezer geometries. Larger beads may be useful in tissue-scale mechanical measurements (ex. wound healing) while the lack of autofluorescence makes the smaller beads ideal for microbead-based assays.

ATTITUDES OF LIFE SCIENCE MAJORS TOWARDS COMPUTATIONAL MODELING IN INTRODUCTORY PHYSICS

Anna E Lewis (Dr. Brandon Lunk), Department of Physics

Biological and health care majors comprise one of the largest populations of students enrolled in physics courses each year. Despite there being deep connections between physics and biological systems, the introductory physics courses for life-science majors (IPLS) are typically treated as ``calculus-light'' versions of the major-track introductory sequence (Meredith and Reddish, 2013). Consequently, this marginalizes these courses from the perspective of the life-science communities. Because of this, there is growing interest within the physics and biology communities to restructure the IPLS courses to better support the needs of the life-science majors by focusing on biologically and medically relevant topics, such as fluids, diffusion and entropy. Computational modeling presents itself a compelling tool in this context. By emphasizing modeling and step-by-step reasoning, deemphasizing challenging mathematics, and including elements of visualization, computational modeling could prove to be an exciting and accessible tool for IPLS students to explore biologically and medically relevant phenomena within physics courses. However, much of the research on making computational modeling suitable for introductory physics has focused exclusively on its use in the major-track courses. This suggests an important thread of research to be done. The long-term scope of this research project is to build towards the development and execution of computational modeling activities for the IPLS course. While there are many questions that will need to be addressed, the focus of this exploratory study is on the question of suitability, that is, how appropriate of a tool is

computational modeling within an IPLS course. Our goal is to learn about life-science majors' attitudes towards programming and the role it might play in physics, in their major, and in their target professional fields. In order to address this question we interviewed 5 undergraduate life-science majors enrolled at North Carolina State University about these topics. We transcribed and have started to identify patterns in these interviews. While data analysis is still ongoing, preliminary observations suggest that these students had an apprehension towards the idea of programming but held a positive attitude towards data tables, which could be used as an introduction to programming in the classroom.

AN ATLAS OF STARBURST GALAXY EMISSION LINES

Helen Meskhidze (Dr. Chris Richardson), Department of Physics

Astronomers expand our understanding of star formation by observing the light given off by distant starburst galaxies (galaxies undergoing exceptionally high rates of star formation). However, there are some limits to what we can deduce by observations alone, and, in some cases, we turn to computer simulations to overcome these limits. Simulations give us greater insight into starburst regions by predicting the simulated light of the system. The comparison of the real and simulated light allows us to both tune our simulations to match observations and infer what is occurring within the physical systems. This project utilizes such simulations to better understand galaxy evolution. Our project is focused on modeling starburst galaxies and their surrounding gas and dust clouds. We hope to better understand the effects that various parameters have on the light emitted from starbursts. Our study addresses the following two questions: 1. What are specific cloud parameters that influence the strength of emission lines in starburst galaxies? 2. How can these parameters be tuned in simulations to match observations? We present the results of hundreds of photoionization simulations spanning 15 orders of magnitude in hydrogen ionizing photon flux and 10 orders of magnitude in hydrogen density. We vary both properties of the starbursts (spectral energy distributions, evolutionary histories, ages), as well as cloud properties (such as the abundances and metallicity), tracking nearly 100 emission lines ranging from the ultraviolet to the near infrared. Finally, we compare our parameter space and our results to the parameter space and results of previous simulations. The results of our photoionization calculations comprise our atlas, which should prove useful to other astronomers for the analysis of starburst galaxy emission-line data.

A HIGH-SURFACE-AREA ACTIVE MICROARRAY FOR BIOSENSING APPLICATIONS

Aaron J. Neaves (Dr. Ben Evans), Department of Physics

We have developed a dense microarray of tall, flexible silicone posts which demonstrates strong potential for use in point-of-care medical diagnostic devices or in targeted cell capture techniques. The posts in the array are 25 μm tall by 0.5 μm in diameter with densities ranging from from 2-20 million posts per square centimeter. Under normal conditions, such tightly-packed silicone posts are highly susceptible to collapse via irreversible adhesion to neighbors. However, we have treated our post array with a hydrophilic silicone surfactant which prevents them from adhering to each other in a fluid suspension. This enables free motion of individual upright posts, resulting in an array with a very large surface area accessible to analytes. In addition, the posts can be fabricated using a *magnetic* polymer, which allows us to actuate the entire array using an external magnet. This has been shown to induce chaotic fluid flow within

the array. The post array was fabricated by filling the pores of a polycarbonate track-etched membrane with liquid silicone or magnetic silicone composite. The filled membrane was placed on a glass substrate and the silicone was cured, after which the polycarbonate membrane was removed by dissolution. The surfactant treatment was applied during dissolution, allowing the completed array to be resuspended in a variety of solvents. Both the active (magnetic) and passive silicone arrays provide a very large surface area which may be well-suited for use in a variety of biosensing applications, such as magnetic-bead and nanoparticle based sandwich assays. In addition, the chaotic flow produced within a magnetically-actuated array dramatically increases opportunities for contact with targeted materials. This constitutes an ideal platform for capturing and sequestering targeted cell types, such as circulating tumor cells for the early diagnosis of cancer.

MAGNETICALLY STIMULATED RELEASE OF A MODEL DRUG FROM A MAGNETIC DRUG CARRIER

Thomas F Riley (Dr. Ben Evans) Department of Physics

The use of particles in the micro- and nanometer ranges has become increasingly important as a therapeutic tool in medicine. In particular, *magnetic* micro- and nanoparticles may allow for both a) magnetically-controlled transport of drugs to a target location within the body and b) magnetically-stimulated release of drugs upon arrival at those targeted locations. As an example, chemotherapeutic agents could be delivered and released directly at the site of a tumor, dramatically increasing the local dose while decreasing systemic side effects. Our lab has previously developed a micron-sized magnetic microsphere which consists of magnetic nanoparticles embedded in a hydrophobic silicone matrix. This unique matrix enables the sphere to absorb significant quantities of a hydrophobic chemical species, such as the chemotherapeutic taxanes, which are poorly soluble in water. The ultimate goal of this line of research is to evaluate the potential of these microspheres for targeted drug delivery in cancer patients. Using ibuprofen as a model drug, I have characterized the drug-carrying capacity of the spheres and have begun to quantify the natural release rate of the drug from the spheres over time. Changes in concentration and chemical structure of the drug can be observed using a UV-visible spectrometer and Olis 3D kinetic modeling software. Results indicate that the spheres can hold an amount of drug comparable to their own mass, and that without magnetic stimulation the drug releases very slowly from the spheres with a time constant on the order of several days. Future studies will investigate directed drug release upon remote magnetic stimulation. By studying the kinetics of drug release, we can evaluate the sphere's potential as a drug delivery vehicle.

POLITICAL SCIENCE AND POLICY STUDIES

MODEL CITIES: RETREAT OR REDISTRIBUTION OF STATE POWER

Jordan M. Grover (Dr. Jason Kirk), Department of Political Science

To date, scholarship in political economy has been slow to catch up with responses to global interdependence. Established research in comparative and international political economy generally views developing countries as weak in the face of global market forces, but states in the global South may be adapting to globalization in ways that retain more power than assumed by the conventional wisdom. The Honduran attempt to create *model cities* may appear to be a

case of state "retreat," but upon closer review, it represents a redistribution of state power. This study investigates Honduras's example of a developing state colliding with an external and independent proposal for radical globalization. It concludes that in the Honduran case, the state has maintained power, but that globalization has also revealed issues within state and society relations and opened a venue for both conflict and change.

MITT ROMNEY: THE STRUGGLE TO FRAME AN IMMIGRATION MESSAGE FOR HISPANICS

Gabriela R. Alvarez (Dr. Laura Roselle), Department of Political Science and Policy Studies

This research studies Governor Mitt Romney's rhetoric surrounding immigration policy during the 2012 primary and general election campaign. It attempts to illuminate how his vocabulary and tone towards Hispanics (as viewed through the lens of immigration discourse) shifted throughout these two time periods. As *The Economist* poignantly penned, "In large part Mr. Romney was the (willing) victim of a primary system that prodded candidates to take ferocious positions that were catnip to partisans, but poison to the general electorate" (Hart and Lind 2013). Five speeches each from the primary and general campaigns were coded for words that regarded immigration policy. After counting the phrases most frequently used and categorizing them according to theme, it was discovered that an initial hypothesis that Romney would speak less to Latinos in the primaries as compared to his general election bid was supported, as was the researcher's assumption that the tone of the language he used in the primaries would be harsher than his general election rhetoric. Despite this finding, however, it was also discovered that the terms he most frequently mentioned derived from more negative vocabularies in the general election than the primary run. In addition, above all other categories of communication aimed at Hispanics in the 2012 election season, American patriotism vocabulary was orated most often, as opposed to immigration rhetoric. These findings suggest that Governor Romney's rhetoric played to conservative partisans throughout his campaign, while his tone towards Hispanics remained largely ambiguous.

CONFLICTING PRIORITIES: THE MORAL AND SECURITY IMPLICATIONS OF RELIGIOUS FREEDOM ON UNITED STATES FOREIGN POLICY IN SUDAN

Pamela C. Gutermuth (Dr. Sean Giovanello), Department of Political Science

This study focuses on the role of International Religious Freedom in United States Foreign Policy through the application of the International Religious Freedom Act (IRFA) to United States foreign policy in Sudan before and after September 11th under the Clinton and Bush administrations. Freedom of religion and from religious persecution have long been central values for many Americans and were recognized internationally in Article 18 of the United Nations Universal Declaration of Human Rights of 1948. Despite this early statement of universal freedom of religion internationally, American law did not codify its support of religious freedom until 1998 with the passage of IRFA. IRFA implemented significant changes and signified the rising importance of religious freedom in American foreign policy. Some, however, feel that the changes were dulled by the ability of the president to waive the mandate for presidential action if this would harm national security. This is seen particularly amongst domestic religious organizations and councils, who have been angered by this waiver, arguing that it also undermines the veracity of American claims that the act is not one of neo-

imperialism, but rather a genuine interest in the universal human right to freedom of religion. Others argue that it is vital to have this national security waiver to ensure stable relations with those who can assist the United States in security efforts. In the wake of September 11th, there was an increase in the number of Countries of Particular Concern (CPCs) who were granted national security waivers, including Sudan. The application of a national security waiver to Sudan angered many Christian lobbying groups in the United States. Those primarily concerned with national security disagreed, arguing it was the proper action to ensure access to the intelligence resources made available by strengthening relations with the Sudanese government. Overall, the results of this study will argue that by applying a waiver to Sudan as granted by the International Religious Freedom Act, President Bush adversely impacted United States foreign policy in the wake of September 11th by creating a precedence of apathy and undermining United States Human Rights foreign policy around the globe.

HILLARY CLINTON'S MEDIA PORTRAYAL IN DIFFERENT ROLES

Emily O. Haley (Dr. Roselle), Department of Political Science

Hillary Clinton has held several roles throughout her political career, including First Lady (1993-2001), Democratic Presidential contender in 2008, and Secretary of State (2009-2013). Due to Clinton's high profile career, she has often been the center of media attention. Much research exists on how female politicians face sexism, or discrimination on the basis of sex, in the media (Bystrom, 2001; Carlin 2009; Miller 2010; Scharrer 2009). This qualitative content analysis analyzes article titles through 5 different time periods in which Hillary Clinton served different roles in her career for key gender words and politically gendered issues, such as mother or education. The current research analyzed article titles from three sources: The New York Times, The Washington Post, and The Wall Street Journal. The results showed that of all of Hillary Clinton's different roles, the media mentioned 'perceived masculine issues' such as foreign policy and finances in article titles the most during her time as First Lady and Secretary of State. Additionally, the results show that references to Hillary Clinton as just 'Hillary' are found more during some roles in others. More specifically, Clinton was referred to as 'Hillary' the most during the 2008 campaign. This research is significant in analyzing how Hillary Clinton's gender impacts her media portrayal and how that may shape her future political career as a potential contender in the upcoming presidential election.

TWELVE MINUTES TO MID-KNIGHT: COLD WAR, CHESS AND THE EVOLUTION OF MEDIA COVERAGE OF BOBBY FISCHER

Nicholas C. Massey (Dr. Harlen Makemson and Dr. Laura Roselle), School of Communications and Department of Political Science and Policy Studies

In the 1972 World Chess Championship, American Bobby Fischer faced reigning Soviet champion Boris Spassky in what Fischer would refer to as a microcosm of the entire Cold War. Fischer's victory over Spassky propelled him to fame that was unprecedented for chess players. However, he would later plunge from the pedestal on which the media had placed him because of his virulent anti-Semitic and anti-American sentiments. Previous studies on the media framing of the rise and fall of sports heroes suggested that early coverage of Fischer would frame him as an "American," while later coverage would attempt to sever any ties he had with the country that had once supported him while he was battling the Soviets on the chess board. This research attempted to identify trends in the evolution of Fischer's coverage, from his Cold War chess

match to his lonely death in Iceland thirty-five years later. To do so, thirty articles were compiled from *The New York Times* and *The Washington Post*, five articles from the coverage of each of six major events that were identified in Fischer's long-term story. The articles were then coded, and seven recurring themes were observed and defined, including: "Fischer the Hero," "Fischer the American," "Anti-Soviet,' "Cold War Rivalry," "Anti-Fischer," "Fischer's Demands," and "Fischer the Un-American." After qualitatively analyzing the articles, it was found that the media's framing of Fischer changed drastically over time, with early coverage framing him as an American hero of undeniable genius and later coverage framing his as an Un-American loner of unforgiveable eccentricities. This study lays a foundation for larger-scale scholarship on the changing images of heroes in the media.

CHANGES IN ALLIANCE POLITICS: A STUDY OF THE UNITED STATES SENATE RESOLUTION TO RATIFY THE NORTH ATLANTIC TREATY ORGANIZATION

Cory M. Nagel (Dr. Sean Giovanello), Department of Political Science

In the years since the end of the Cold War, NATO expansion has been hailed as a great triumph of diplomacy and also slammed as the one of the great mistakes of American foreign policy. The first and most influential wave of expansion was after the Cold War and brought Hungary, Poland, and the Czech Republic into the defensive alliance. For all the controversy in academic and policy circles at the time of expansion, there was little serious opposition to the treaty among government elites. The Clinton administration took a vocal and leading role in pushing NATO expansion at home and abroad. The Senate provided its advice and consent as well. The relative ease with which NATO expansion moved through the Senate stood at odds with the controversy it produced in academic and policy circles. This project examines the Senate debate over NATO expansion in 1998. It is a qualitative case study of the Senate process of advice and consent to expansion. It borrows from Krepon and Caldwell's method of analyzing United States treaty ratification efforts (Krepon & Caldwell, 1992). This project analyses this specific effort through four different lenses: 1) international political context; 2) domestic political context; 3) congressional-executive relations; 4) role of public opinion and media. The purpose of this study is to identify why this major national security issue received minimal debate while the Senate was considering it. Three factors seem to explain this. First, there was bipartisan consensus that NATO expansion was in the national interest of the United States. Second, the weakness of Russia at the time meant few Senators publicly questioned the possibility that Russia might seek to reassert itself in its former sphere of influence. Finally, the political skill of the Clinton administration and the willingness of the Senate Foreign Relations Committee to attach conditions to the treaty mollified potential opponents, making the treaty an easier sell in the Senate.

WHAT'S INTELLECTUAL CLIMATE? A CASE STUDY CONCEPTUALIZING, MEASURING, AND EXAMINING FACTORS OF CAMPUS CULTURE.

Sarah E. Paille-Jansa (Dr. Jason Husser), Department of Political Science

"Intellectual climate" as a topic in higher education is far less researched than many facets of campus culture. What is the appropriate conceptualization of intellectual climate in a higher education setting? How should researchers go about measuring the concept? What independent variables influence intellectual climate as a dependent variable? And, what other aspects of the university experience are influenced by intellectual climate? The answers to these questions will

inform university administrators in making policy, establishing and sustaining programs, and evaluating the university structure as it relates to campus culture centered on a vibrant intellectual community. This project is a case study of Elon University, a private comprehensive master's level institution in the Southeast. I address the question of conceptualization of "intellectual climate" through in-depth interviews of over a dozen administrators, faculty, staff, and students as well as documents and notes from multiple group discussions. I explore measurements of "intellectual climate" based on several metrics available to the university as well as through identification of proxies of positive intellectual engagement such as "time spent outside of class discussing academic topics". Through analysis of the qualitative interview-based study, I offer theoretical concepts that may influence intellectual climate at an institution as well as aspects of the university setting that might, in turn, be changed by intellectual climate. The results of this project are on-going. Preliminary findings include the need for depth and integration of curricular, co-curricular, and extra-curricular experiences. The subjects of vulnerability, authenticity, and whole-person learning have been the focus of many of the interviews. These concepts are used throughout units on campus through various modes (ie mission statements, strategic plans). Analysis of the interview data in relation to university metrics and theoretical concepts of the purpose of higher education further provides a means of assessing the intellectual climate at Elon University.

DEFACING HISTORY: ANALYZING DAMNATIO MEMORIAE

Michael M Papich (Dr. Laura Roselle), Department of Political Science

This research attempts to answer the question of why governments use *damnatio memoriae* — the destruction of records and iconography of past leaders by the current leadership. Examples of Soviet and Roman *damnatio memoriae* were qualitatively analyzed to assess the type of defacing done and the individuals who were defaced under the Roman Empire (examples taken from 63 BC to 208 AD) and the Soviet Union (examples taken from 1920 to 1960). Main sources for these *damnatio memoriae* examples were David King's The Commissar Vanishes and Eric Varner's Mutilation and Transformation because they are the most extensive collections of visual examples available. Analysis shows that there were similarities in how earlier Roman governments (42 BC to 37 AD) and the Soviet government used *damnatio memoriae*. Roman use changed over time as *damnatio memoriae* was less thorough and was reserved for overthrown political opponents while Soviet *damnatio memoriae* totally erased a person from the visual record and was used on those who questioned the path of Stalin's Soviet Union. One conclusion is that younger empires may be interested in trying to create a substantial change in a culture and can accomplish this through erasing history by using *damnatio memoriae*. Established empires, like the Roman empire in later periods, have a more established political culture and use *damnatio memoriae* to warn about what happens when that culture is not upheld. Analyzing the differences in the way damnation memoriae was applied in these political bodies can unlock larger realizations about the make-up of these world powers and about empires in general. In addition, present-day examples of *damnatio memoriae* can now be better measured and understood along the guidelines set in this research.

SAYING ONE THING, DOING ANOTHER: HYPOCRISY IN THE FOREIGN POLICY OF THE UNITED STATES AND SOVIET UNION

Mary A. Rouse (Dr. Laura Roselle), Department of Political Science

The literature on strategic narratives suggests what political leaders say matters in world politics because narratives help construct acceptable norms for foreign policy behavior. But what are the repercussions if strategic narratives and actions contradict each other, in other words when states are perceived to act hypocritically? This research examines the role of hypocrisy in US and Soviet foreign policy during the Cold War, focusing on four cases from 1954 to 1968: the Prague Spring, Hungarian Revolution, Guatemalan coup d'état, and occupation of the Dominican Republic. These historical cases inform a current debate in international relations theory about the role of strategic narratives and repercussions of hypocrisy in global politics more broadly. Using Atlas.ti, to code government documents, speeches, and measures undertaken by each country, a case study analysis of Soviet and US strategic narratives about broad foreign policy goals was first conducted. Espoused values of freedom, self-determination, and territorial sovereignty were proclaimed by both super-powers while blaming the other for destabilization and failing to acknowledge the discrepancies between their own narratives and actions. The study then analyzes how charges of hypocrisy in the four cases affected each country's international credibility and relations with allies through internal government documents. The unique bipolar hegemony of the Cold War suggests the credibility of United States and Soviet Union was negatively impacted, but allies of each country remained committed because of global uncertainty during the period.

THE GREAT ENIGMA: HOW AMERICAN HISTORY TEXTBOOKS PORTRAYED THE COLD WAR

Kelly E. Swaim (Dr. Laura Roselle and Dr. Harlen Makemson), Department of Political Science and School of Communications

The Cold War affected nearly every piece of media for forty years. However, few people have studied how the Cold War was portrayed in history textbooks. The research question in this study is how did American history textbooks published in 1966 and designed for High School students portray Cold War conflicts? Previous literature suggests that American history textbooks are more ethnocentric and present fewer contrasting viewpoints on the Cold War when tensions between the United States and the Soviet Union are higher. This study analyzes three American History textbooks published in 1966. A qualitative content analysis focused on how the textbooks present four Cold War conflicts between the United States and the Soviet Union—the Yalta conference, the Berlin Blockade and Airlift, the U-2 Affair, and the Cuban Missile Crisis—by categorizing the explanations as ideological or "real politik" as defined by Carlson. An ideological explanation simplifies complex situations by presenting information in an uncontested format and blaming decisions on ideology instead of on strategic political and military concerns, while using ethnocentric or derogatory language in association with the Soviet Union (Carlson, 1985, p. 57). "Real politik" explanations acknowledge the existence of multiple viewpoints, and present strategic interest on both sides as a cause of conflicts (Carlson, 1985, p. 58). Also a quantitative frequency analysis examined how often each category of explanation was used. The findings of this study show that ideological explanations were used approximately three times as often as "real politik" explanations. There was not a significant difference in the percentage of ideological and "real politik" explanations between the four events studied. The textbooks studied were highly patriotic and ethnocentric and portrayed the Soviet Union in a particularly negative light. This study could be used to help create an analysis

of textbook coverage of the Cold War over time seeing as most studies of the Cold War in textbooks focused on later textbook editions.

TO GREEN OR NOT TO GREEN: UNDERSTANDING VARIATION IN CLIMATE CHANGE POLICY ADOPTION BY U.S. STATES

Shannon A. Temlak (Dr. Jason Husser, Dr. Sharon Spray), Department of Political Science & Policy Studies

Individual states in the United States play an increasingly important role in addressing climate change (Rabe, 2008). However, they vary greatly in their level of effort in reducing carbon emissions that contribute to climate change. A rich literature attributes variation in state policy adoption, in general, to factors such as legislative professionalism, income per capita, and gross domestic product, but variation in climate policy adoption, specifically, remains less understood. Why do some states enact substantial climate policies while other states have taken minimal legislative action? This study identifies the primary factors explaining variation in climate change policy among the fifty states. Adhering to the internal determinants model (Berry & Berry, 1990), I maintain that state policymakers adopt policy in response to the internal characteristics of their state. I hypothesize that an additive relationship between political institutions, economic circumstance, and underlying environmental characteristics explains significant difference between high policy adopter states and low policy adopter states. Specifically, states with high pollution severity, high legislative professionalism, high gubernatorial power, and high urbanization are more likely to adopt climate policies. I also hypothesize that low carbon-generating activities and low fossil fuel economic dependency cause states to enact substantial climate policies. Evidence from a cross-sectional analysis of state-level measures suggest the following factors increase state climate policy adoption: low carbon dioxide emissions per capita, high legislative professionalism, high gubernatorial power, large urban populations, low highway vehicle-miles-traveled per capita, low gasoline use per capita, low farming share of GDP, low electricity generation from fossil fuels, few coal reserves, and low employment in the natural resources and mining sector. Results suggest wide-scale subnational implementation of climate and environmental policies faces a host of both remaining barriers and unexploited opportunities.

STUDENT, FACULTY, AND STAFF PERCEPTIONS OF HIGHER EDUCATION POLICIES TO PROMOTE INCLUSIVE COMMUNITY

Lori R. Schachle (Dr. Kenneth Fernandez), Department of Political Science & Policy Studies

In the realm of higher education, the presence of an inclusive community, one which actively accepts and celebrates diverse perspectives and backgrounds beyond mere tolerance or structural diversity, has shown benefits for educational, social, interpersonal, and developmental aspects of student life. However, the effectiveness of administrative efforts promoting inclusive community in a campus environment heavily relies on student feedback and perception of the administrator-driven policies and programming. This research seeks to identify perceptions of stakeholders in the community at Elon University regarding policies intended to foster an inclusive community. Under the framework of Deweyan Multiculturalism and the seven dimensions outlined in the Foundations of Excellence Project, policies are examined regarding three key areas: effectively communicating the importance of diversity and expectations for behavior, encouraging

encounters with diverse perspectives, and mitigating incidents of controversy or conflict. Student, faculty, and staff perceptions of inclusive community policies are measured through an online survey and semi-structured interviews of each group. The online survey yielded 965 student responses (approximately 26% response rate) and 356 responses from faculty and staff. Data is analyzed using logit and order logit regressions to understand variation in attitudes and support for the concept of inclusive community and perceptions of university actions. Preliminary findings have uncovered diverse and complex attitudes regarding the importance of promoting an inclusive community. Furthermore there is not a consensus as to how effective the university has been as an advocate for inclusiveness. There is evidence of a disconnect between the university's stated goals and how students, staff, and faculty perceive university actions.. Potential policy alternatives regarding pedagogy, co-curricular programming, and effective communication are discussed. As a private regional university in the south, Elon University poses an exemplary but informative case that can be used as a guide for many other types of institutions in the United States seeking to implement policies to improve and strengthen an inclusive community.

PROGRAM FOR ETHNOGRAPHIC RESEARCH AND COMMUNITY

PERCS SYMPOSIUM: ETHNOGRAPHY ACROSS DISCIPLINES

Justin Brown (Dr. Amy Allocco), **Leena Dahal** (Dr. Mussa Idris), **Rachel N. Shippee** (Dr. Michael Matthews)**, Omolayo N. Ojo** (Dr. Tom Mould), Departments of Religious Studies, Sociology and Anthropology, and History and Geography

The Program for Ethnographic Research and Community Studies (PERCS) is dedicated to the ethical exploration of local, national and global communities through ethnography - a method of studying the social and cultural diversity that depends heavily on participation, observation and interviewing. The goal of PERCS is to foster the understanding and use of ethnographic field research across all the social and behavioral sciences. The symposium highlights the ethnographic research of undergraduate scholars in the fields of Anthropology, Communications, English, International Studies, and Religious Studies. This multidisciplinary panel showcases ethnographic scholarship in global contexts as well as in our local community. Omolayo Ojo (Mould) explores transnational identity within the Senegalese diaspora. Rachel Shippee (Matthews) investigates women's social movements for the advancing women's rights in Argentina. Religious Studies major Justin Brown (Allocco) examines gender, culture, and religion through narratives from a Hindu temple in Cary, NC. Finally, Leena Dahal (Idris) uses ethnography to understand African and Asian refugee resettlement in Greensboro, NC as a pathway to a community-based participatory impact assessment. The panel of researchers will engage in dialogue with each other as well as audience members about themes that emerged in all of their work. These themes include immigration, resettled refugees, gender, religion, ethical dilemmas, and identity. They will examine the relationship between a person's multiple identities and how people construct religious, cultural, political, and gendered identity in different contexts, particularly during times of social change or upheaval. We hope that this panel will highlight the work of ethnographic research and how these themes impact methodology.

PSYCHOLOGY

IMPLICIT LEARNING AND MENTAL PRACTICE IN A PREDICTIVE MOTOR TASK

Kristen Alyssa Iler (Dr. Thomas Green), Department of Psychology

Previous studies have concluded that implicit learning processes (no instruction) can be more beneficial to performance on a task than explicit processes, when explicit instructions about a pattern are given (Gobel, 2013; Green and Flowers, 2003). Also, previous research has shown that mental practice can be an effective practice method that rivals or surpasses physical practice, especially for tasks with more cognitive components (Feltz & Landers, 1983; Shanks & Cameron, 2010). The current study combined these two research areas to investigate the effect of learning and practice types on performance in a serial reaction time (SRT) task. Participants were initially presented with 1440 SRT trials, in which a dot could appear onscreen in one of four locations. Participants pressed the key that corresponded with the position of the appearing dot as quickly as possible, and the computer measured reaction time to the stimuli. The dot location followed a specific 12-digit pattern. Following completion of the SRT pretest trials, participants received instructions specific to their condition. Those in the explicit learning groups received instructions about the pattern present within the dots of the SRT, whereas the implicit learning group was not informed about the presence of the pattern. Similarly, participants were given practice instructions per assigned practice condition, and completed 15 minutes of either physical (n=30), mental (n=30), or no practice (n=29). Participants in the physical practice conditions were instructed to complete SRT trials that were identical to those in the pretest, whereas participants in mental practice were guided through mental imagery of the SRT task for 15 minutes. Following the 15 minute practice phase, all participants completed a posttest of 1440 SRT trials. Data was analyzed via ANOVA for mixed factorial designs. Results revealed significant improvement (lower RT scores) from pre- to post-test for all conditions. The results also showed mental practice to have the greatest improvement from pre- to post test. Further, the results revealed all conditions learned and used the predictive pattern regardless of if they were told the predictive pattern or not. The findings are discussed in terms of difficulty of task and cognitive resource limitations.

"DEEP LIKE THE SEA AND STRONG LIKE THE EARTH": EXPLORING THE IDEAL PARTNER CHARACTERISTICS OF YOUNG ADULT BLACK WOMEN

Brenda M. Reavis (Dr. Buffie Longmire-Avital), Department of Psychology

Research indicates that only 52% of Black American women (BAW) will marry by age 30, compared to 81% of White American women. Research also shows that BAW prefer a partner of the same race; however due to factors that disproportionately affect Black American men such as incarceration and early death rates, unemployment rates, and lower educational attainment, finding a desirable Black male partner is more difficult. Inability to find an ideal partner correlates with an increase of sexual partners over the life course, thus exposing BAW to health risks. The current study investigates why the discrepancy in marriage rates for BAW exists. Particularly, we looked at which characteristics heterosexually active Black American women are seeking in an ideal partner as well as what three characteristics are considered non-negotiable. Data gathered from 128 non-married Black American women (ages 18-29, mean age=23) who completed an anonymous survey was analyzed. The data was reviewed and an

initial code book was created with previous literature as the basis. That codebook was then used with Atlas.ti . and data was analyzed for themes related the type of traits that BAW look for in a male partner. Then, unique themes that emerge from the data itself (which is a process in grounded theory approach) was noted and used to reanalyze the results for theory development. Three main themes emerged: an overwhelming desire for companionship, interest in the investment potential of possible partners, and a "tall, dark, and handsome" narrative. Surprisingly, the desire for a Black male partner was only mentioned 18 times as an ideal, and only once as a must have trait. Possible implications for this are that BAW who are highly educated or seeking higher education have learned not to expect Black American men to be a part of the pool of viable partners.

TESTIMONY ACCURACY AND COMMUNICATION PROCESSES OF ENGLISH-AS-A-SECOND-LANGUAGE EYEWITNESSES

Cecily A. Basquin (Dr. Meredith Allison), Department of Psychology

American and Canadian police officers have to interact with community members who are not proficient in English (National Institute of Justice, 1999). Few psychology and law studies have considered ESL speakers (e.g., Lee, 2009) even though 20.6% of Canadians' first language is not English or French (Statistics Canada, 2011) and 15% of Americans reported that they did not speak English well (Ryan, 2011). I examined testimony accuracy during questioning when mock police officers interviewed English-as-a-second-language (ESL) eyewitnesses. The participant-witnesses were recruited from the English Language Center at a Canadian university and spoke English with moderate proficiency. The seventeen undergraduate Psychology-student mock officers spoke English as their first language. Eyewitnesses viewed a video of a mock theft and were later interviewed on video. After I identified 78 details in the crime video, I measured eyewitness accuracy for the details for both their free recall and cued recall responses. Eyewitnesses gave more accurate information in free (M = 17.41, SD = 5.29) than cued recall (M = 5.94, SD = 1.68, $F(1, 16) = 378.53$, $p < .001$) but made more errors in cued (M = 3.88, SD = 2.12) than free recall (M = .94, SD = .66, $F(1, 16) = 74.92$, $p < .001$). Second, I analyzed the tapes using an annotation software program (ELAN) to get a finer measure of accuracy. I identified idea units or "complete thoughts" in the testimonies (Dritschel, 1991), which I analyzed for accuracy using detailed rules (inter-rater reliability for two groups was 85.3%). Eyewitnesses made an average of 42 accurate statements and an average of 8.58 errors. Of the 17 eyewitnesses, 16 had one or more inaccurate idea units about the perpetrator, and 11 had one or more inaccurate idea units about the getaway vehicle. Accurate details, especially perpetrator and vehicle descriptions, can be imperative to solving crimes where strangers are involved, and these results indicated that accurate recall is difficult for eyewitnesses. Future research will focus on misunderstandings due to language.

PARENTS' PERCEPTIONS OF THE TRANSITION TO ADULTHOOD FOR YOUNG ADULTS WITH INTELLECTUAL DISABILITIES IN FAMILY AND COMMUNITY CONTEXTS

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A growing body of research focuses on the transition to adulthood as a time of tremendous growth and change. Research is lacking, however, on atypical populations. This study examined the extent to which parents believed their children had experienced cognitive, social and

behavioral development in the context of a sheltered workshop program, and the extent to which they perceived their children as adults. Twenty-five parent-child dyads were recruited from an adult day-training program run by a community-based non-profit organization in the Southeastern United States. The Family Life Survey (McConnell, Savage, & Breitkreuz, 2014) was used to collect information on family resources, congruence, and adaptation along with information on the nature and severity of the child's disability and level of adaptive functioning. The mean age of the young adults in the sample was 27.4 years (range 21 to 34 years). Parents reported their children had moderately severe intellectual disabilities (n=10), autism (n=5), both intellectual disabilities and autism (n=9) and cerebral palsy (n=1). Parents reported overall low levels of disruptive and stereotypic behaviors. In addition, low levels of financial hardship and moderate levels of social support were reported. Semi-structured interviews were conducted with the parents regarding perceived adult status of their children and developmental growth in the sheltered workshop. Most parents believed their children had experienced significant social, cognitive and/or behavioral development. A majority of parents considered their children adults due to their age, the accomplishment of the developmental task of identity achievement, the ability to sustain mutual social relationships, and ability to engage in meaningful work. However, many stated that their children are not 'typical' adults due to constraints on their independence. These results suggest that the ability of young adults to participate in high-quality community-based programs has a positive effect on young adult development. Research on the dynamics of the transition to adulthood of an atypical population can contribute to the development of supportive systems and services for youth with disabilities. In addition, it contributes to the diverse developmental trajectories of young people.

PERCEPTIONS OF TRANSGENDER INDIVIDUALS: INTERNAL AND EXTERNAL DESCRIPTIONS AS PREDICTORS OF PREJUDICE

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In comparison to attitudes towards gay, lesbian, and bisexual individuals, attitudes towards transgender individuals are relatively underrepresented in psychological research (Worthen, 2013). One reason for this may be that the definition of transgender is not universally understood by participants, which can make assessing attitudes challenging. A transgender person is someone whose gender identity does not completely correspond to their sex assigned at birth. Whereas gender identity is an internal and personal experience of one's own gender, lay-understanding of the term "transgender" might instead mistakenly focus on the more visible external characteristics of gender expression, such as attire, behavior, and physical appearance. The current research used an online survey method to assess both the content of undergraduate students' thoughts and beliefs about transgender people as well as their level of anti-transgender prejudice. Participants were asked to respond anonymously to two open-ended questions. The first question asked respondents, "What does the word transgender mean?" and the second question prompted respondents to, "Please write a few sentences describing some of the thoughts, images, or ideas that come to mind when you think of a transgender person." After the free-response questions, participants filled out a series of questionnaires that included a scale designed to measure anti-transgender prejudice. Participants' responses to the first two questions were coded by independent raters, and several important themes emerged. Analyses of these codes showed that responses that referenced internal factors (e.g., identity) as a defining component of being transgender were associated with lower levels of anti-transgender prejudice. In contrast, responses referencing exclusively external attributes (e.g., appearance and behavior)

were associated with higher levels of prejudice. This research shows that people's beliefs about what it means to be transgender are an important predictor of their attitudes toward transgender individuals. Though this research is correlational in nature, one possible interpretation of these findings might suggest that educating people on the internal nature of gender identity could be important for combating anti-transgender prejudice.

THE TRANSITION TO ADULTHOOD IN COLOMBIAN IMMIGRANTS: ETHNIC IDENTITY, FAMILY OBLIGATION AND THEIR EFFECT ON CAREER ASPIRATIONS

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This study explored the transition to adulthood in a sample of Colombian immigrants in the United States. Previous research on the transition to adulthood has shown that those with higher levels of resources tend to flourish, while those with low levels of resources are more likely to flounder (Côté, 2005). Although Colombian immigrants tend to be low on financial resources, a strong sense of ethnic identity and family interdependence might provide additional resources that contribute to academic and career success. Previous research has shown that higher levels of family obligation are associated with higher levels of motivation for academic achievement in adolescence, as students want to meet their parents' high expectations and do well for the benefit of the entire family (Fuligni, 2001). In this sample of emerging adults, higher levels of ethnic identity were predicted to be associated with higher levels of family obligation which would then predict higher career aspirations. A bilingual online survey was created which included measures of ethnic identity (Phinney, 1992), family obligation (Fuligni & Tseng, 1999) and career aspirations (Seginer, 2003). Local Colombian immigrants between the ages of 16 and 25 were recruited, and social media was used to locate participants throughout the United States. A snowball technique was then used; participants were asked to pass on the survey to anyone else they knew who fit the criteria, until a total of 60 participants had responded. A correlational analysis revealed that those young adults who identified more strongly with their Colombian heritage also more strongly endorsed family obligation and had higher levels of career aspiration. A mediation analysis indicated that family obligation significantly mediated the relationship between ethnic identity and career aspirations. Qualitative data allowed us to illustrate these findings with specific personal narratives. The results supported the hypothesis that this group's interdependent relationship with their family would lead to a strong motivation to have a successful future career. Despite the relatively low socioeconomic status of their parents, these participants reported intentions of pursuing advanced degrees in prestigious fields.

ORAL 5-HTP DOES NOT AFFECT FINE MOTOR CONTROL

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Although marketed as a psychoactive nutritional supplement, knowledge of the cognitive effects of the serotonin precursor 5-hydroxytryptophan (5-HTP) is limited. Animal studies have demonstrated that exogenous 5-HTP promotes the production of serotonin (and reduces dopamine production) in dopaminergic neurons. Such a dopamine reduction has been suggested by our lab's behavioral studies, which demonstrated 5-HTP induced cognitive deficits in the Iowa Gambling Task and the Tower of London task. However, it remains unclear if the 5-HTP induced performance decrement observed on the Tower of London task was the result of a motor

or cognitive impairment. The objective of this study was to clarify this point by determining if oral administration of 150 mg of 5-HTP produces reductions in fine motor control, as measured by the Grooved Pegboard Test. Participants also completed a computerized adaptation of the Russell Revised Short form of the Halstead Category Test (RCat) as a general measure of executive function. This study followed a double-blind, placebo-controlled design. Seventy five university undergraduates randomly received three unmarked capsules containing either a gelatin placebo or a total of 150 mg of 5-HTP, and self-administered these capsules following standardized instructions. Each participant completed the Grooved Pegboard Test and the RCat. The two groups did not differ in the amount of time needed to complete the place ($p = 0.67$) and remove ($p = 0.48$) tasks for the Grooved Pegboard Test. For the place task, there were significant effects of self-identified sex ($p = 0.01$) and handedness ($p = 0.03$). In the remove task, only handedness was significant ($p = 0.04$). The two groups did not differ on any component of the RCat (all p's > 0.65). The oral administration of 150 mg of 5-HTP does not cause impairments to fine motor skills. This clarifies our lab's earlier findings, as 5-HTP induced reductions in performance on the Tower of London task must be cognitive in nature, and cannot be the result of motor impairment. These results also provide important safety information for 5-HTP, as oral doses that approximate a recommended daily dose as a supplement do not produce measurable motor impairment.

CORE SELF EVALUATIONS, ACADEMIC BURNOUT, AND THE MODERATING EFFECT OF PERCEIVED ORGANIZATIONAL SUPPORT

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This survey-based study examined two popular constructs in organization psychology research, core self-evaluation (CSE) and perceived organizational support (POS), in the context of a college setting. More specifically, the study sought to determine whether CSE and POS could individually predict academic burnout (AB) among a sample of 199 undergraduate students. CSE is a latent construct that underlies the familiar traits of self-esteem, self-efficacy, emotional stability, and locus of control (Judge, 1997); whereas POS reflects the degree to which an individual feels that her organization cares about her well-being and values her individual contributions (Eisenberger et al., 1986). Academic burnout refers to the phenomena of long-term fatigue and loss of interest in schoolwork, and is characterized by a student's lack of engagement, dulled emotions, and feelings of helplessness (Gold, 1988). The hypotheses that CSE and POS would each individually predict AB were supported; an additional hypothesis that POS would have a significant moderating effect on the CSE-AB relationship was also supported. More specifically, the CSE-AB relationship was found to be significantly stronger when POS was high than when POS was low. Implications and potential applications of these results are discussed as a means to mitigate the negative effects of AB experienced by so many college students.

EXPLORATION OF THE PIT BULL STIGMA IN AN ONLINE ENVIRONMENT: AN ANALYSIS OF IMPRESSION FORMATION AND ONLINE DISCUSSION GROUPS

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Although the pit bull was once one of the most beloved dog breeds in America, today it is widely feared. The stigma associated with the breed may possibly spread to pit bull owners as well, inducing a "courtesy stigma" (Twining, Arluke, & Patronek, 2000), as people may judge them

for owning such a dangerous dog. This project contained two studies. The primary empirical study investigated how the presence of a picture of a pit bull, as opposed to a Labrador retriever, in a person's online profile would influence impression formation. We hypothesized that the emotional state evoked by depictions of pit bulls would cause people to form more negative first impressions of the person pictured with the pit bull, regardless of the corresponding verbal information on the profile. Analyses of variance showed participants rated the person when depicted with a pit bull rather than Labrador to be lower on Agreeableness, $F(2, 72) = 3.67$, $p = .03$, and lower on approachability, $F(2, 72) = 2.681$, $p = .075$. Further, the results of path analyses supported a partial mediating effect of positive affect on both Agreeableness – indirect effect = -.34, with 95% CI (-1.0782, -.0028) and approachability – indirect effect = -.45, with 95% CI (-1.3845, -.0217). The power of stigmatized first impressions to become self-fulfilling prophecies (Madon, Willard, Guyll, & Scherr, 2011) points to a potentially serious adverse influence on owners' social relationships. Earlier research has suggested that people may turn to online discussion groups as one way to cope with such stigma (Beals, Peplau, & Gable, 2009). Thus, this project also included an exploratory study examining how pit bull owners may utilize online discussion groups, such as Facebook's Pit Bull Rescue Central fan page, to manage their stigma. The site presents positive PR for their beloved breed, a place to post positive sentiments for their dogs, and to view similar postings by others. Taken together, the two studies suggest that the stigma associated with pit bulls as a breed affects pit bull owners as well, and that the owners may turn to online support groups to manage their felt stigma.

RACE-RELATED STRESS AND ITS RELATIONSHIP TO OBESITY RISK BEHAVIORS FOR EMERGING ADULT BLACK AMERICAN WOMEN

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More than half (52.9%) of Black American women (BAW) over age twenty are labeled obese, compared with 37% of Black men and only 33% of White women. BAW's sociocultural experience has been shown to be a critical social determinant of health. A facet of this sociocultural experience is racial microaggressions, which are small actions that communicate hostilities or disregard toward a person as a result of their ethnic identity. While microaggressions are often not overtly racist, they frequently result in higher sensitivity and increased internalizing responses in BAW. This internalization produces race-related stress. However, there has been limited research that directly examines how the internalization of that experience is linked to both maladaptive and health-promoting behaviors among BAW. This study examined how race-related stress is related to maladaptive health behaviors in emerging adult BAW. Specifically, is race-related stress a significant an independent predictor of exercise behavior and emotionally-driven eating habits? One hundred and seventy-nine BAW who identified as current college students or recent graduates (ages 18–25, m = 21) completed an anonymous online survey. A 3-step hierarchical linear regression with an $R^2 = 0.31$ found that emotional eating is a function of race-related stress (B=.241, p =.015) in addition to body anxiety (B=.27, p =.001) and depressive symptomology (B=.27, p =.004). Further, race-related stress is the only psychosocial variable related to health-promoting behaviors. Higher reported levels of race-related stress are associated with greater frequencies in swimming (r=.16), yoga (r=.19), and exercise machine use (r=.223). The ongoing experience of racial inequities and the resulting oppressive structures BAW must navigate through can be internalized and related to psychosocial well-being and physical health. The implications of these findings will be discussed with regard to targeted interventions to reduce health disparities.

PARENTAL SUPPORT OF YOUNG CHILDREN'S SCIENTIFIC REASONING THROUGH INQUIRY GUIDANCE

Melissa J. Mischka (Dr. Vandermaas-Peeler), Department of Psychology

In school environments, it has been found that the use of inquiry-based approaches in science teaching is beneficial for students. Inquiry-based approaches utilize open-ended guiding questions to encourage children to observe, question, predict, evaluate and draw comparisons in order to enhance their understanding of abstract concepts (Bruner, 1986; Peterson, 2009). However, much of the knowledge base that young children acquire comes from within the social context of the home and family, not just school. This observational, experimental study investigated parent guidance of math- and science-related activities. Participants included 28 parent-child dyads, with children 4 or 5 years of age. The dyads were randomly assigned to a control or an inquiry group. The inquiry group received training regarding the inquiry-based approach and was asked to use this method for the duration of the study. Over four weeks, each dyad completed a total of eight activities; one activity each week was audio-recorded for later analysis. The primary dependent variables were the type of guidance provided by parents, and children's abilities to observe, question, predict, evaluate, and compare. Results of one-way analyses of variance indicated that inquiry training influenced the types of questions parents used to guide their child's learning in various activities. Parents in the inquiry group were significantly more likely to use open-ended phrases, such as "what do you notice?" which led to higher frequencies of spontaneous observations and questions from children. Parents in this group were also significantly more likely to ask prediction, evaluation, and comparison questions, prompting the child to demonstrate more complex thinking, such as comparing and classifying objects, plants and animals. Furthermore, results indicated that as parents continued to use the inquiry method throughout the activities, children in the inquiry group made significantly more spontaneous predictions and evaluated them with evidence. Further results concerning types of guidance and children's reasoning processes in different activities are in progress. The findings will inform parents and early childhood educators about the effectiveness of using an inquiry-based approach to support young children's mathematical and scientific thinking, and highlight the importance of early childhood learning within the context of the home.

MATHEMATICAL LEARNING IN EARLY CHILDHOOD: PARENTAL GUIDANCE DURING VIRTUAL AND PHYSICAL GAME

Kaitlin R. Sands (Dr. Vandermaas-Peeler), Department of Psychology

Research conducted in preschool settings has shown that when young children practice predicting and evaluating difficult mathematical concepts, they are more likely to have increased numeracy performance by evaluating their own predictions in the future (Gelman & Brenneman, 2004; Gelman, 2006). However, no known research has examined this in the context of numeracy activities at home. There is also very little research examining parent guidance of preschoolers' math learning in virtual and physical games. Therefore, this study investigated the effect of training parents to employ a predicting and evaluating method of guidance on children's numeracy abilities; the influence of parent-child engagement in experiences related to the mathematical skills over a one-month period; and the nature of the activities (physical versus virtual). It was expected that with parent guidance for predicting and evaluating math skills, children would be more likely to spontaneously evaluate their predictions and demonstrate

increased accuracy. Furthermore, it was expected that parents across all conditions would be more likely to guide numeracy during physical games in comparison to virtual games. Twenty-eight families with a 4- or 5-year-old (11 girls, 23 mothers, 2 fathers, 3 families with mothers and fathers) were randomly assigned to a guidance or control group. After a short assessment of the child's mathematical abilities, families in both conditions were left with games and other activities to do together over a four-week period. After four weeks, a post-test was conducted where families in both conditions played a new set of physical and virtual games focused on counting, fractions and measurement, and the math assessment was repeated. Preliminary results suggest that parents provided more guidance in physical activity contexts as opposed to virtual contexts. Parents who received training were more likely to ask their children to make and evaluate predictions, but this varied across activity contexts. Further analyses are in progress. Results of this project will provide evidence of the importance of the social environment for young children's learning, particularly regarding the support parents provide as they engage in various activities with their preschoolers.

PERCEPTION AS "ITEM" OR "CONTEXT" CHANGES MEMORY ACCURACY: IMPLICATIONS FOR MEDIAL TEMPORAL LOBE CONTRIBUTIONS TO OLDER ADULT MEMORY

Abigail B. Steinsiek & Luisa B. Cesar (Dr. Amy Overman), Department of Psychology & Neuroscience Program

The population of older adults is steadily growing, and there is an urgent need to understand the basis of older adults' memory impairment. Studies of young adults have demonstrated that making associations in memory depends on the contributions of structures in the medial temporal lobe (MTL), but the effect of aging on these contributions is not known. The Binding Item and Context (BIC) model of memory (Diana, Yonelinas, & Ranganath, 2007) predicts that hippocampal decline in older adults results in a shift toward greater contributions by perirhinal cortex for item-item binding, but that the hippocampus remains critical for item-context binding. All prior studies of item-item and item-context binding have used different stimuli for the item-item and item-context conditions thus confounding *stimulus* type with *association* type. Our hypothesis is that by manipulating the presentation of the same category of stimuli such that one presentation is more context-like and the other is more item-like, older adults should be able to complete the item-item binding better than the item-context binding. Older (n=26) and younger (n=28) adults participated in an experiment in which they encoded pairs of item-item and item-context stimuli for which the "itemness" and "contextness" was manipulated. Participants were later asked if they remembered both the item and the associative information. We found that the age difference in associative memory was larger for Item-Context memory than Item-Item memory (encoding condition X age group interaction, $F(1,52)=6.43$, $p=.014$; YA > OA overall, $F(1,52)=27.6$, $p<.001$). Critically, age differences in *item* memory were not affected by encoding condition, demonstrating that our manipulation did not affect memory per se but only the associative binding itself, as intended. Our findings provide support for the BIC model and suggest differential contributions of MTL structures based on the type of association that is being made in memory rather than MTL contributions that reflect the inherent properties of the stimulus itself as the domain dichotomy account would predict (Davachi, 2006). A follow-up fMRI study is planned. The detailed understanding of age-related memory impairment gained from this project is critical to developing strategies to overcome memory difficulties experienced by healthy older adults.

PUBLIC HEALTH STUDIES

INTERGENERATIONAL IMPACT OF HIV: PERCEPTIONS OF ADOLESCENTS WITH PERINATALLY-ACQUIRED HIV ON PARENTING AND THEIR CHILDRENS' FUTURE

Hannah M. Allen (Dr. Cynthia D. Fair), Department of Public Health Studies

Little is known about intergenerational effects of HIV, which include living with a transmissible and stigmatized illness and possibly the loss of biological parents. The socio-cultural context of an HIV affected family influences parenting perspectives and experiences of adolescents and young adults (AYA) with perinatally-acquired HIV (PHIV). This project explores the perception of AYA living with PHIV as they assume their role as parents to the third generation of an HIV-exposed family. Eleven AYA with PHIV – current or former patients at pediatric infectious disease clinics – who had children or were currently pregnant, completed semi-structured interviews. The mean age of the participants was 22 years (range 18-29). Ten participants were female. Participants were asked about the rewards/challenges of parenting, their childhood experiences with their own guardians, and future goals including anticipated fertility desires/intentions. Qualitative analyses revealed that participants expressed normative parenting rewards and challenges as well as unique themes associated with their HIV status. These included concerns about not "being there" for their child due to sickness and worries that their child may experience HIV-related discrimination. Many participants expressed surprise that they could have a child who was HIV-negative. Some participants intended to have another child in the future, which was motivated by a strong desire to create a family unit that they did not have because of HIV-related illness or death. One participant noted, "I always wanted a big family because… I lost my family." AYA with PHIV grapple with many of the same issues as other young parents. However, they also have HIV-specific needs that influence their parenting experiences. Providers should anticipate the fear of transmission to the child and the effect that losing a parent has on fertility desires. Increased understanding of the effect that intergenerational HIV has on these parents will allow providers to better counsel this population. Many of these AYA report the important role that support from providers can have in their parenting perspectives. The experiences of these unique adolescents in their transition to adulthood and parenthood may greatly impact the development and success of their uninfected children.

HEALTH CARE TRANSITION FOR CHILDREN WITH SPECIAL HEALTH CARE NEEDS: PROVIDER PERSPECTIVES ON PARENT OUTCOMES

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As children with special health care needs (CSHCN) mature into adolescents they will ultimately need to transition from pediatric to adult care. Pediatric clinics are primarily family-based where caregivers and parents play a large role in disease management Parents are responsible for scheduling appointments, filling medications, communicating with physicians and other care team members and having specific knowledge about their child's disease. In the adult care setting the adolescent, not the parent, is expected to be fully responsible for their own disease management. Limited research has explored parent emotional and behavioral outcomes associated with successful health care transition for CSHCN. A web-based survey was

distributed through the international Health Care Transition Research Consortium (HCTRC) list serve, which is comprised of providers, patients, and family members, dedicated to improving the health care transition of CHSCN. Participants responded to the open-ended question, "What parent-related outcome(s) would represent a successful health care transition?" Respondents included 118 providers (83 medical providers, 14 social service providers, and 21 researchers or other). Responses were coded for emergent themes. The most commonly reported emotional outcome, mentioned by 50 respondents (42.4%), was the parents' ability to "let go" or "take a step back" from managing their child's disease and become more of an advisor. Parent satisfaction and confidence in their child's care and transition was identified by 42 respondents (35.6%). Respondents also noted that parents should experience an improved sense of well-being and decreased stress (n=9, 7.6%) due to a successful transition. Behavioral outcomes included early preparation and planning for transition of care (n=12, 10.2%) and parents teaching their adolescent the knowledge and skills necessary to independently manage their disease (n=10, 8.5%). Parents may need assistance from healthcare providers in learning how to teach transition strategies for teaching disease-related knowledge and skills to their child as well as receive support in order to "let go" of the caregiver role. Communication between the pediatric care team, adult care team, parent and adolescent patient must be consistent and comprehensive in order to insure continuity of care.

PROVIDER PERCEPTIONS OF STIGMA AND DISCRIMINATION THAT ADOLESCENT AND YOUNG ADULT, HIV-POSITIVE PATIENTS ENCOUNTER IN HEALTH CARE SETTINGS

Meredith L. Berk (Dr. Cynthia D. Fair), Department of Public Health Studies

Historically, children with perinatally-acquired HIV (PHIV) were viewed as the "innocent victims" as their HIV infection was not acquired through sexual/drug related means. Today, adolescents with PHIV are surviving into young adulthood and are engaging in developmentally expected behaviors such as establishing intimate, sexual relationships. Like other youth, those living with PHIV often need to access sexual and reproductive health (SRH) services particularly as they begin developing sexual relationships. Previous research has documented stigma and discrimination experienced by adult women living with HIV as they try to access SRH care. However, little is known about the experiences of stigma and discrimination encountered by the maturing adolescents and young adults (AYA) with PHIV when accessing services. HIV health care providers (HHCPs) who frequently care for AYA with PHIV are in a unique position to learn about and understand the stigma and discrimination experienced by their patients in formal service settings. HHCPs (n = 59, 29 medical and 30 social service providers) were recruited using snowball sampling, and completed an online survey based on patient-shared experiences of stigma and discrimination when accessing health care and social services in general and specifically when seeking SRH care. More than half (n=32) of the respondents believed that patients with PHIV were no more or less likely to encounter HIV-related stigma when accessing SRH services compared to patients with behaviorally-acquired HIV. However, 38.5% (20/54) of providers reported that their patients with PHIV had shared encounters of stigma or discrimination when accessing medical care or social services related to sexual and reproductive health. Coded open-ended provider comments indicated that AYA patients experienced challenges with providers who were unfamiliar with PHIV and believed that those with HIV should not have children and often counseled patients to terminate their pregnancy, were surprised that someone with PHIV is still alive, and lectured AYA about their "poor choices." As AYA with PHIV transition out of pediatric and adolescent care, it is important for providers

to simultaneously help them navigate care in other health settings, as well as educate adult health care providers about possible misconceptions of caring for individuals with PHIV.

ALL WORK AND NO PLAY? HOW THE PSYCHOLOGY BEHIND WORKPLACE PEDOMETER-BASED PROGRAMS CAN PREDICT ADHERENCE

Megan T. Flynn (Dr. Eric Hall), Department of Public Health Studies

The health and economic benefits of workplace wellness programs are well founded, but the favorable results only occur when employees choose to participate and adhere with the programs. Participation is a key factor in any intervention, and this study furthers current knowledge on the subject. This study used a prospective design to examine if the Theory of Planned Behavior (Ajzen, 1985) and Self-Efficacy Theory (Bandura, 1977) could predict participant adherence to a pedometer-based walking program, where participants were required to walk 5 miles a day for 9 weeks. The sample consisted of 110 faculty and staff at a private North Carolina university who enrolled in a walking program through the university's wellness center. There were 93 females, mean age was 42.0 ± 11.6 years and mean BMI was 27.2 ± 6.0. Participants completed surveys at the beginning of the program, which measured self-reported physical activity, barrier self-efficacy, walking self-efficacy, and Theory of Planned Behavior constructs (e.g., attitude, subjective norm, perceived behavioral control and intention). The participants' survey answers were analyzed alongside how many miles each participant walked during the program to determine which factors were most effective in predicting adherence. 60% of participants met the program's goals of walking 225 miles over 9 weeks. Self-reported physical activity ($p = .036$), barrier self-efficacy ($p=.016$), walking self-efficacy ($p=.002$), and intention ($p=.001$) were greater in those who met the goals than those who did not meet the goals of the program. There were no differences for attitude ($p = .090$), subjective norms, perceived behavioral control, BMI or age ($p > .10$). This suggests behavioral interventions aimed at increasing participant self-efficacy and intentions could positively affect program adherence and the successfulness of a workplace wellness program.

EMBODIMENT OF INEQUALITY: EXPLORING CULTURAL CONSTRUCTIONS OF CHILDBIRTH AND THE PRENATAL DECISIONS OF EXPECTANT MOTHERS

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This study explores the embodied experiences of inequality, by asking how the birth experiences of low-income women reflect broader structural inequalities that are known to influence birth outcomes in the United States. The ways in which women discuss agency in their stories about pregnancy and birth give insight into how expectant mothers are making their prenatal health decisions and more about the factors that affect birth outcomes. The way that the body and birth are perceived becomes embedded in the functions and standards of pregnancy and childbirth, thus disparities can be better understood through the embodied experience, necessary for understanding the intersubjectivity of experience. Semi-structured interviews were conducted with women with different experiences of birth options available in NC (e.g., hospital birth attended by an OB/GYN, out of hospital birth attended by a midwife, hospital birth attended by a midwife). Data collection began with a preliminary study at Women's Birth and Wellness Center (WBWC) in Chapel Hill, NC and more participants were recruited from the Women, Infant, Children (WIC) clinic in Alamance County. Eleven face-to-face interviews were conducted and lasted from twenty to ninety minutes. Interviews were fully transcribed using the program F5 and

Atlas.ti was utilized to code and analyze the data thematically. Analysis of completed interviews revealed that distrust of medical authority, feeling emotionally supported, and cultivating autonomy and agency in the birth process figure strongly in perinatal care, birth decisions, and the perceptions of the experience of childbirth. Themes of attachment, trust, and being heard are juxtaposed against anxieties of detachment, suspicion, and oppression in birth stories. Contextualizing women's experiences with patterns of disparities in prenatal care and childbirth choices and outcomes reveal more about reproductive health disparities. The narratives collected illustrate the range of experiences women have in pregnancy and childbirth. They also tell an intricate story about inequality through the embodied experiences of pregnant women in the United States. The political economy of birth was examined through themes found in the narratives: agency and decision making, fear and excitement for the baby, and empowerment and interactions with medical care providers.

"I'M AFRAID WHAT THE KID IS GOING TO HAVE": A QUALITATIVE STUDY OF RELATIONSHIP AND CHILDBEARING PERSPECTIVES AMONG HISPANIC AMERICAN ADOLESCENTS WITH PERINATALLY-ACQUIRED HIV

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Little research has investigated Hispanic American youth with perinatally-acquired HIV (PHIV), who comprise 13% of those living with PHIV (CDC, 2012) and are now surviving into young adulthood. Previous research on typically developing Hispanic American adolescents indicates that their socio-cultural context can influence relationship and childbearing desires. Yet little is known about Hispanic American adolescents with PHIV. Fifteen Hispanic American adolescents with PHIV (10 females) recruited from a pediatric infectious disease clinic in southern California completed face-to-face semi-structured interviews (mean age = 19.8 years, range 15-25). Participants were asked open-ended questions about intimate relationships, fertility desires/intentions, knowledge of mother-to-child-transmission (MTCT), and the role PHIV has played in their lives. Participants also completed the Bidimensional Acculturation Scale for Hispanics (Marin & Gamba, 1996) to assess levels of acculturation. The majority of participants have been in a romantic relationship, and every participant acknowledged that PHIV had caused issues related to disclosure, fear of rejection and transmission. One-third indicated they stayed with a less than desirable partner as he/she knew and accepted the participant's HIV status. Six participants were parents, all of whom took steps to avoid MTCT, and had uninfected offspring. However, very few participants, including those with children, accurately reported the risk of MTCT with most overestimating the chance of transmission. The majority of participants expected to have children in the future and did not consistently use contraceptives or condoms. Eleven participants were acculturated to both Hispanic and American cultures, while the remaining four were only acculturated to the American culture. Hispanic American adolescents with PHIV, like other adolescents with PHIV, are engaging in romantic relationships and desire children. Since all participants in this study were acculturated to the American culture and therefore fluent in English, language barriers do not explain the low knowledge of MTCT or contraceptive use. However, it is possible that other Hispanic cultural expectations may influence how adolescents with PHIV utilize information on sexual and reproductive health. There is a need for culturally appropriate interventions that respect Hispanic cultural norms yet promote the development of healthy relationship and family formation goals.

RELIGIOUS STUDIES

CALL AND RESPONSE, AMBIGUOUS LANGUAGE, AND SAMPLING: USAGE AND FUNCTION IN SPIRITUALS AND RAP MUSIC

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In this paper, I investigate how contemporary rap music can be seen as a continuation of the tradition of African-American spirituals and camp-meeting songs. In so doing, I draw upon the Henry L. Gates Jr.'s concept of "signifying," a practice that has its roots in spirituals, and study how it is employed in rap music. I explore the function of certain elements such as call-and-response, ambiguous language, and signification in the tradition of spiritual songs and probe how they form religious meaning in their context. Then, I explore these same elements in rap music, seeking to explain how their function changes in this new setting. In order to address this question, I will use the methodological approach popularized by Vincent L. Wimbush in his essay, "Textures, Gestures, Power: Orientation to Radical Excavation." Wimbush puts forth an interpretive practice to be used when studying scriptures. His method, termed Signifying on Scriptures, has much to do with *what* a text communicates and *how* a text is used to communicate, both of which helps us see how both spirituals and rap music provide a venue for addressing the social injustices of slavery and current racism.

INTERPRETING *NEON GENESIS EVANGELION* THROUGH AN ANTI-WESTERN LENS

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Neon Genesis Evangelion is a popular animé television and film series that chronicles the lives of three young robot pilots trying to save the world from Angels (i.e., foreign invaders looking to destroy Earth). Much scholarship on this series focuses on the psychological themes of alienation and the question of self-identity. This paper, however, contributes to the series' academic scholarship by discussing the often-neglected socioeconomic context of the series, which was produced in the 1990s amidst Japan's trade imbalance with the US and its subsequent "bubble economy" crisis. The paper references academic and newspaper articles, pop culture websites, online interviews with the creator Hideaki Anno, the *International Journal of Political Economy*, and the series itself in order to determine the historical, economic and sociological context at the time. These investigations help to explain the franchise's overt expressions of anti-Western sentiment and "Japaneseness" (*nihonjinron*). In many parts of the series, cultural tensions between Japan and the West are exhibited on multiple levels. On the micro level, the personal rivalry between the Japanese pilot Shinji and the German-Japanese pilot Asuka reveals both attraction and aversion to the culturally unknown Other. Furthermore, on the macro level, tensions between the Japanese corporation NERVE and the global corporation SEELE reveal Japan's deep anxiety over the conflict between commercial and cultural protectionism vs. nascent globalization. As a result, this paper argues that Shinji embodies the need for a "truly Japanese" hero by serving as an anti-Jesus figure. That is, unlike Jesus who ultimately fulfilled his Father's divine plan for salvation on Earth, Shinji by contrast, lacks the confidence to save the Earth according to his father's command. This analysis of *Evangelion* thus provides a much needed historical context to the series, proposes that Shinji personifies "Japan" in light of both

foreign collaboration and competition, and ultimately argues that the series expresses the xenophobic attitudes of Japanese culture in the 1990s.

MAPPING BUDDHISM IN RURAL AMERICA

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This study focuses on Buddhist enclaves in rural America, and identifies the reasons behind the establishment of Buddhist temple and center clusters in rural US counties with relatively low populations (fewer than 50,000 people). Buddhism has grown significantly in the United States over the past 50 years, since the 1965 Immigration Act opened US citizenship to greater numbers of Asians, and Americans began experimenting with Asian traditions in a globalizing world. This growth has resulted in approximately 0.7% of the US population identifying as Buddhist as of 2010. This growth has not been limited solely to the urban settings that are the primary focus of religious studies scholars. Rather, it has also occurred in rural America, as demonstrated by new, original, maps created using data from the Association of Statisticians of American Religious Bodies. These maps were made for this study, illustrating 7 counties in which a much higher percentage than the national average self-identifies as Buddhist. Some counties indicate that as high as 10% of the population adheres to one of the three main schools of Buddhism (Theravada, Mahāyāna, or Vajrayāna). In these counties, detailed micro-histories of 11 case studies were gathered from temple and center websites and local articles. From this information, it was found that Theravada Buddhist enclaves in Virginia and Arkansas established their locations as a result of immigrant transplantation from Southeast Asia. Mahāyāna Buddhist temples and centers in Oregon, Iowa, and Texas chose their locations based either on proximity to specific towns and borders. The Idaho-Oregon Buddhist Temple in Oregon chose its location based on the local history of a town where ethnic Japanese clustered during WWII due to relocation from the coast and in Iowa, one center chose its location because it was close to other states as well and could serve more than just Iowa. Vajrayāna Buddhist enclaves in Colorado chose their locations according to traditional Tibetan geomantic principles and the resemblance between the Himalayas and the Rockies. In this way, this project on mapping Buddhism in the rural US also conceptually maps onto larger patterns of American Buddhist transplantation, hybridization, and transformation.

TRANSCENDING THE HYPHEN: THE GROWTH OF LATINO PROTESTANTISM IN THE UNITED STATES

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This paper explores the conversion of Latino immigrants in the United States from Catholicism to Protestantism by engaging sociological and anthropological accounts of the religious traditions of Latinos in the United States. As Latino immigrants are submerged into a foreign U.S. culture, they face the choice of assimilation into the new culture or preservation of their existing culture, in which religion plays a major role. Latino immigrants that convert to Protestantism are more likely to attain higher educational levels, occupational status, socioeconomic status, and levels of English proficiency, in comparison to their Catholic counterparts. However, through the process of segmented assimilation, in which second-generation immigrants become more assimilated and exposed to the U.S. culture than their parents, Protestantism also allows for parents to maintain and transfer their ethnic culture onto

their children by Spanish-language usage in religious settings and accruing social capital of fellow Latinos. In this way, the theory of segmented assimilation, explained by Stephen Warner, depicts the dual character of Protestantism, which aids in both acculturation to the United States and preservation of Latino culture.

CROSS EXAMINATION: BELIEF, WITNESSING AND CHANGE IN THE MARTYRDOM OF SAINT MAXIMILIAN KOLBE

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Saint Maximilian Maria Kolbe, a Franciscan brother, is arguably one of the most compelling martyrs of the 20th century, having been killed by the Nazis in Auschwitz in the place of a Polish army sergeant. Looking at his life and death, we are able to see how history *shapes* martyrs and how martyrs *shape* history. How does bearing "witness", the root meaning of the Greek *martus*, embody this reflexive dynamic? Through my research, I find that witnessing occurs before, during, and after an act of martyrdom, ultimately shaping the perspectives and actions of others within the theater of history. In the case of Kolbe, he witnesses against the Nazi party through his work with the Franciscans prior to his death, and the act of his death is a public act of witness. In the words of church historian Elizabeth Castelli (2004), following this act, communities of belief "reinscribe" the presence of martyrs onto the communities' identities, living out martyrs' examples (p. 4). According to Haynes (1994), this practice is carried out by Christian Holocaust theologians who use figures like Kolbe as lenses for understanding Jewish-Christian relations during and after the Holocaust. Mirroring this practice, I specifically use Kolbe as a lens for understanding historical and current "reinscriptions" of his presence onto the fabric of communities, especially those affected by the Holocaust. The life and works of Kolbe serve as a basis for my analysis, as I employ the methods of historical and textual analysis using methodological lenses provided by Castelli and early Christian historian L. Stephanie Cobb (2008). My scholarly investigation of Kolbe's martyrdom reveals how re-interpretation (and "reinscription") of the past through witnessing can challenge belief systems and expand the relevance of religious practice for both the present and future. Such influence and change testify to how martyrdom is not an isolated event but rather an evolving motivational force that others continually live out. The interplay between martyrdom and motive is integral to understanding how history *shapes* martyrs and how martyrs *shape* history.

THE SACRED SPACE OF CONVERSATION: CROSS CULTURAL COMMUNICATION AND PROTECTION OF IDENTITY IN 21ST CENTURY FRANCE

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The reciprocal relationship between the formation of language and culture has been studied since Aristotle first discussed *The Art of Rhetoric*. Repercussions of the clash of language and culture have modernized, and have formed gigantic rifts between cultures that struggle to accommodate each other. In combination with first hand experiences and the analysis of scholarly texts, this research explores the effects of both verbal and nonverbal communication across language barriers and between people of different cultures. More specifically, this research attempts to define the relationship between the hegemonic power of language and the protection of Muslim and French identities in 21st century France. From the perspective of postcolonial theory, this paper unearths the latent effects of dominant culture on modern religious, political, and social customs that continue to haunt the paradoxical French (who are both politically progressive and

customarily traditional). An example of the conflict existing between language and culture, as well as France's paradoxical culture, can be found from the reaction to the Charlie Hebdo terrorist attack in January of 2015: Personal conversations with French citizens (who identified as Jewish, Muslim, and Christian) revealed a conflict with Article XI of the Declaration of The Rights of Man and the foundational principle within Islam that forbids the depiction of Muhammad. Violent actions from the most conservative and radical sect of Muslims occurred as a reaction to the clash of two cultures, whose tension has a longstanding history with colonization (i.e. Algerian Revolution) and preservation of identity. An element of Islam that stems from the radical interpretation of the Quran and continues to clash with Modern French culture comes from its origins in the seventh century. Scholar Majid Khadduri claims that the religion addresses its ultimate objective as world domination, and refuses to negotiate with existing powers (1956). Since then, both cultures have evolved significantly on their own. However their shared desire to protect their identities through language and culture has inhibited such progress. Conclusions of this research reveal that language is integral to the formation of culture, and that communication is the most important element in negotiating cross cultural understanding. They also reveal that current unrest among Muslims and Jews in France will continue if the unwillingness to accommodate conversation persists at both an individual and community level.

SOCIOLOGY AND ANTHROPOLOGY

PEOPLE, PLANTS, AND BREASTFEEDING; THE CONTEMPORARY USE OF BOTANICALS IN MANAGEMENT OF LOW MILK SUPPLY AMONG HEALTH CARE PROVIDERS AND BREASTFEEDING MOTHERS

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In the U.S., a mother's perceived insufficient milk supply is one of the most common reasons for breastfeeding cessation. As a result, plant-based galactagogues have grown quite popular among breastfeeding mothers. The knowledge and use of plant-based lactogens has historically been the domain of women - midwives and experienced breastfeeding mothers. Increasingly the knowledge of and use of herbal galactagogues is conceptualized as a "risk behavior" in biomedicine. A major reason for biomedical anxieties around herbal galactagogue use is that the physiological mechanisms by which plants influence human lactation, and their impact on infant health, are not well-described in the biomedical literature. The prevalence of galactagogue use among breastfeeding mothers and health professionals has not been examined recently in the U.S. The purpose of this study is to describe the use of plant-based galactagogues among breastfeeding mothers as well as the health providers who oversee lactation care. This ongoing study relies on data from an anonymous online survey tool distributed to breastfeeding mothers, pediatricians, OBGYNs, midwives, doulas, lactation consultants, WIC breastfeeding peer counselors, and general family practice physicians. Breastfeeding mothers (n=102) have been reached through social networks, and medical professionals (n=93) have received the survey through administrators. Due to the online nature of the study, the survey has been spread internationally, although the majority of respondents (92%) of respondents live in the United States. While we are still collecting data, preliminary results have found that 63% of breastfeeding respondents (n=102) have experienced low milk supply, although only 48% of

respondents have been formally told by a healthcare professional that her milk supply was low. Seventy-one percent of breastfeeding mothers reported ever using a galactagogue. We will use descriptive statistics to compare breastfeeding mother's perceptions of herbal galactagogue safety and efficacy to healthcare providers' perceptions of herbal galactagogue safety and efficacy.

PATIENT-DOCTOR RELATIONSHIPS AROUND CONTRACEPTIVE CHOICES IN WOMEN DISCONTINUING REPRODUCTION

Nicole C. Panaggio (Dr. Alexis Franzese), Department of Sociology

Women seek a variety of methods when discontinuing reproduction and have varied reasons for arriving at the decision to use specific methods. This study investigates how patient-doctor relationships can impact a women's decision on contraceptive choices and permanent procedures to discontinue reproduction. Previous studies have focused on the specific outcomes of contraceptive methods such as their effectiveness and side effects, but neglect to examine how women come to the decision to use such methods and how relationships with medical professionals can influence this decision. This study analyzes the medical and biological methods used to discontinue reproduction in relation to a woman's larger decision-making process around family building and family size. Specifically, this study explores how Caucasian women age 30 to 39 choose specific methods to discontinue reproduction and patient-doctor relationships surrounding their contraceptive choices. Semi-structured interviews were conducted with approximately 50 females to explore the intricacies of this decision-making process and the nature of patient-doctor interactions around this process. These interviews provide important insights regarding factors that contribute to a woman's decision to discontinue reproduction and the implications of those choices for health and well-being. Preliminary analyses suggest that the following factors play an influential role in the likelihood of a dialogue about contraception occurring and about the content of that dialogue: how permanent the contraceptive method was, the number of children in the family, and the woman's age. In viewing family completion as a holistic process, this study emphasizes how women come to decide their family is complete, select methods to ensure this decision, and how this decision is impacted by patient-doctor interactions surrounding reproductive medicine. The implications of these contraceptive choices and patient-doctor relationships will be analyzed in the relation to public health and reproductive medicine.

AUTHENTICITY, SEXUAL ORIENTATION, AND MENTAL HEALTH AMONG COLLEGE STUDENTS

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How do individuals who identify with a non-majority sexual orientation negotiate authenticity in various settings? Recent research on youth and sexual orientation demonstrates that because adolescents are still undergoing emotional, social, and cognitive development, individuals who do not identify as heterosexual often endure a difficult path of coming to terms with their sexuality and 'true-selves,' and are at increased risks for negative mental health (Omoto & Kurtzman 2006). These health problems include but are not limited to alcohol and drug abuse (c.f., McKirnan & Peterson 1989), increase in sexual activity and HIV contraction (c.f., Grossman 2001), experiencing bullying and discrimination (c.f., Hall 2007), and suicidal

thoughts and actions (c.f., Russell 2003). The current study involves an extensive literature review and in-depth qualitative interviews that were conducted with 28 college students in the Southeastern United States. The sample included individuals who identify as queer (n= 4), gay (n=4), and bisexual (n=3). The sample of 28 students included a comparison group of 14 heterosexual individuals, which allows for exploration of how individuals of varying sexual orientations conceptualize, articulate and enact their sexual identity and broader sense of self and identity in ways that feel authentic. Sociologically, this work is important because it explores the influence of social structures and interpersonal relationships on individual health. Psychologically, this work is relevant because it examines the significance of personal identity and the challenges associated with the perception of the 'true-self.' Preliminary findings suggest that sexual orientation has a direct influence on authenticity such that individuals who do not identify as heterosexual reveal having a more difficult time expressing their 'true-selves.' In addition, we found that an individual's sense of self-presentation is altered depending on the social context. Furthermore, individuals who do not identity as heterosexual engage with the topic of authenticity more than individuals who do identify this way. However, these individuals may feel inhibited from expressing their authentic selves, often leading to cognitive dissonance, which can have negative impacts on their social interactions, and well-being.

A SOCIOLOGICAL ANALYSIS OF THE IMPACT OF ADOPTION ON FAMILY COMPLETION

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This study investigates how the experience of creating or expanding a family through adoption impacts the transition to becoming a completed family. It seeks to reveal the extent to which the role of adoptive parent influences self-views and emotional or psychological implications for completion. Families who chose to create or expand their families through adoption are of particular interest in the context of family completion. Since certain processes involved with building a family through adoption are dissimilar from building a family biologically, there is reason to believe that the transitions to family completion may also differ. Using a mixed methods approach, the current study will clarify the process of creating or building and also completing a family through adoption. Scholarship will be guided by three essential questions: (a) How has the adoption process influenced familes' willingness to expand further? (b) What specific factors implicated in adoption (e.g., time, age, financial cost, social support) influenced family building choices? (c) How has becoming an adoptive parent shaped participant's sense of themselves? Participants were recruited using flyers placed in adoption agencies and in online adoption discussion boards, and included 11 parents from the Southeastern United States who had adopted at least one child and now considered their families complete. Parents of various family structures (single- and two-parent households), sexual orientation (heterosexual, lesbian, and gay), types of adoption (international and domestic), and age of the child at the time of adoption (infant and older child) were represented. Data collection methods consisted of 30 – 80 minute semi-structured interviews, preceded by a brief questionnaire. Results were analyzed using the qualitative analysis software, ATLAS ti. Findings revealed that the adoption process did impact participants' willingness to expand their families further, particularly due to the time and financial investments required in adoption. Stress and other significant adverse emotions brought on by the adoption process reduced the likelihood of subsequent expansion through adoption. The adoption process also involved unique emotional preparations for family building.

Being an adoptive parent shaped some participants' self-views in that their relationship was based on social, rather than biological, ties.

RESILIENCE IN CHILDREN: EVALUATION OF NARRATIVE-BASED COMMUNITY INTERVENTIONS

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In recent years, the concept of resilience has evolved from a static psychological concept into a multidisciplinary field that takes into account the social context of the individual. Although discrepancies exist among definitions of resilience, the concepts of adversity and positive adaptation remain constant themes in most definitions of resilience (Fletcher & Sarkar, 2013). Sustainable resilience requires a focus on personal strengths, self-organization, self-control, and social connection. Further, communities foster personal resilience through connections individuals have with social institutions (Zautra, Hall & Murray, 2010). Within the current study the relationship between sustainable resilience and social connection during childhood is articulated and its implications explored. The current research builds on existing scholarship that demonstrates the importance of social support for well-being and incorporates the child's sense that he or she is a part of something larger than him or herself. This extension, combined with the authors' perspective that resiliency exists not only on the individual level, but also on the family and larger community levels and narrative-based intervention protocol, offers a novel, sociologically grounded contribution towards fostering sustainable resilience in children. This research agenda will be implemented through three studies which use an experimental study design and which are hypothesized to produce changes in children's sense of relatedness, a key marker of individual resilience (Resiliency Scale for Children and Adolescents, RSCA; Prince-Embury, 2008). Study 1 (completed) evaluated the extent to which participation in a film-based resiliency intervention was associated with changes in sense of relatedness among elementary-aged students. Study 2 will evaluate the ability of a narrative-based intervention to produce changes in sense of relatedness for a sample of high-school students. Study 3 will evaluate the extent to which children's sense of relatedness can be cultivated through participation in a dyadic narrative-based mentoring program. We expect that the interventions will universally be associated with an immediate increase in sense of relatedness following the intervention and a sustained increase in sense of relatedness for children with higher levels of relatedness prior to the intervention.

THE ROLE OF DEVELOPMENTAL DISABILITY IN FAMILY COMPLETION

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This study explores the impact having a child with a developmental disability has on an individual's determination that their family is complete. In doing so, it contributes to the inconsistent literature on the role of developmental disability in childbearing and family size. Participants were recruited for participation through the distribution of flyers and brochures, e-mail listservs, and online advertisements or social media pages. The participant sample includes 23 parents of children with developmental disabilities who consider their family complete. All participants reside in the Southeastern United States, and volunteered as part of a larger Family Choices Study. Male, female, and gender non-conforming individuals are represented, as well as individuals who identify as heterosexual, lesbian, bisexual and gay. Data was collected via semi-structured interviews and brief questionnaires. The interviews were held in public venues and

lasted between 45 and 90 minutes. Individuals also completed a pre-survey and post-survey questionnaire as part of the overall study protocol. Quantitative findings reveal that the impact of having a child with a developmental disability on family life varies significantly. Among the participants, a wide spectrum of responses from "no impact" to "severe impact" was reported. The majority of participants, however, gave responses that fell into the moderate-severe impact category. Despite this apparent impact, very few participants attributed the birth of their child with a developmental disability as the determining factor of their decision to discontinue reproduction or complete their family. Additional analysis of the qualitative-based interviews reveals themes of both negative and positive experiences directly related to having a child with a developmental disability. Commonly reported negative themes include increased stress and experiences of stigma, while positive themes of increased resiliency, improved self-efficacy, and a heightened sense of purpose were also frequently reported.

SPORT AND EVENT MANAGEMENT

THE FACTORS INFLUENCING MAJOR LEAGUE SOCCER: A SOCIOECONOMIC SUSTAINABILITY MODEL

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The purpose of this mixed methods study is to understand league executives' perceptions and examine factors that best represent socioeconomic sustainability for professional soccer in the United States. This study identifies key factors and emerging themes to explain sustainability for Major League Soccer (MLS). A conceptual model was developed that represents MLS socioeconomic sustainability. For this study, socioeconomic sustainability is defined as the combination of social and economic sustainability, which involves accessibility and affordability (Robinson, 2004) to develop stronger relationships among fans, teams, and the league. Social sustainability involves opportunity and inclusivity (Copus & Crabtree, 1996), how individual teams and the league as a whole are able to develop a relationship with a growing fan base. Economic sustainability is the financial ability (Copus & Crabtree, 1996) of an organization to grow, including the ability of teams to gain profits and generate revenue for MLS. The main research question for the study was: What factors best represent a model for socioeconomic sustainability of MLS? An interdisciplinary approach in methodology allows for a more complete understanding of socioeconomic sustainability for MLS. Qualitative research involved interviews with executives of MLS, teams, and other successful sports leagues. Quantitative analysis involved examining factors that represent socioeconomic sustainability. Preliminary results indicate an importance in fan experience, marketing, broadcasting, and international exposure. Interviews were conducted with industry professionals that led to the identification of emerging themes that executives in the sport management industry believe to be important for socioeconomic sustainability. These themes, in addition to existing literature and statistics, were analyzed to identify significant variables for socioeconomic sustainability in MLS. The evidence generated from the study provides a socioeconomic sustainability model for MLS. This conceptual model will be used by team and league executives to enhance professional soccer as a segment in the sport league industry.

HIGHER EDUCATION ADMINISTRATORS' PERCEPTIONS REGARDING THE ROLE OF CLUB SPORTS IN THE RECRUITMENT AND RETENTION OF MALE STUDENTS

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A current issue in higher education is the declining trend of males attending college. In 1970, males represented 58% of undergraduate enrollment; by 2010 that number dropped to 43%. By 2020, the National Center for Education Statistics (2014) anticipates that number will fall to 42%. Because of this downward trend, universities are working hard to attract males. Club sports are a potential strategy to help recruit and retain male students. One study reported 40% of students said club sports played a significant role in their decision to continue at the institution (NIRSA, 2010). The purpose of this study was to examine the perceptions of higher education administrators concerning the role club sports play in recruiting and retaining male students. In 2013, 4.5 million males participated in interscholastic sport (NFHS, 2014). Many will not play at the varsity level in college but may still want to play competitively. Club sport has provided that option. In 2009, 2 million college students played club sports, so there is a market for club sports to be used as a recruiting and retention method (Blumenthal, 2009). Four North Carolina schools were studied and 4-5 administrators from each school were interviewed (n=17). Administrators from campus recreation, admissions, and the department that oversees campus recreation (e.g., student life) were interviewed to gain an overall perspective at each institution. In addition to semi-structured interviews, campus tours and club sports facilities were also observed. Document analysis was conducted on admissions, campus recreation, and club sports brochures, pamphlets and webpages. A team of researchers using content analysis decided on final themes from each case. The results of this study found club sports are used at each institution to recruit and retain male students at varying levels. Due to the amount of academic and non-academic opportunities at each school studied, club sports may not be a first option when recruiting or retaining males. However, subjects interviewed acknowledged the possibility for success for a specific male market interested in playing competitive sport. If administrators are able to appeal to this market, universities could be more effective in recruiting and retaining male students.

ATTENDANCE BEHAVIOR AT COLLEGIATE FOOTBALL GAMES: A MIXED-METHODS APPROACH

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An increasing challenge in collegiate football programs is a fluctuation in attendance rates from game-to-game and year-to-year. This includes elite programs, with continuous winning records and national championships, to have attendance rates shift from 750,000 to 630,000 from one season to the next ("*NCAA football attendance*", 2014). Pre, during, and post-game variables influence attendance levels ("*College football fan market*", 2012). In addition, Division I football admission fees have increased by 28%, resulting in a 10% attendance drop (Coates & Humphreys, 2007). The purpose of this mixed-methods study was to understand athletic administrators' perceptions as to why consumers attend Division I collegiate football games. By doing this, athletic administrators will gain insight about attendance behavior at collegiate football games beyond examining attendance, performance records, and television viewership. This study used a quantitative approach to compare six university attendance profiles, performance records, and television viewership. In addition, qualitative data was gathered from six athletic administrators, representing different Division I universities within the southeast, that were interviewed and three game day observations that occurred during the 2014-2015 football season. Credibility, transferability, dependability, and confirmability were used as trustworthiness criteria to develop themes that best represent why consumers attend Division I

collegiate football games (Anfara, Brown, & Mangione, 2002). Through interviews conducted with administrators and field observations at games, the preliminary results revealed that the type of activities provided on game day and the facilities with technology were two themes that encourage higher attendance rates at games.

WORLD LANGUAGES AND CULTURES

L'ENVAHISSEMENT DU « FRANGLAIS » DANS LES MÉDIAS : PERCEPTIONS DE LA GÉNÉRATION « Y » EN FRANCE VIS-À-VIS LA LANGUE FRANÇAISE (THE INVASION OF "FRANGLAIS" IN THE MEDIA: PERCEPTIONS OF THE FRENCH MILLENNIALS TOWARD THE FRENCH LANGUAGE)

Astrid A. Adriaens (Dr. Sophie Adamson), Department of World Languages and Cultures

The French see their language as an art form. In fact, ever since 1635, the *Académie Française* has fervently tried to codify, standardize, and preserve their language through rules and regulations against the use of English in French media. This desire to protect their language can be attributed to the perception that France's unique position in the global arena has been undermined by the predominance of the United States, transitioning France from an empire to a "middle power." However, the "purity" of the French language is still challenged each day with the increase in Franglais – the mixing of English and French – in advertisements aimed at French youth. This research explores why, where, and how Franglais is used to attract young French consumers, known as Generation "Y" (Millennials). These 18-20 year olds have seen the country's largest unemployment rate in all of its history, causing many to seek opportunities abroad. The research reveals that the French youth's attitudes and perceptions about their own language offer insight into why this restless generation may be emigrating. Through an analysis of French advertisements and a survey of seventy-two French students aged 18-20, the results suggest that the French Millennials are largely unaware of the current laws that are in place to protect the French language. Additionally, there is a predominant common belief that in order for France to have a large presence in the global marketplace, the *Académie Française* must revisit certain laws that restrict both the growth of French companies outside of France and foreign companies inside of France. The findings highlight growing disparity between Generation "Y" and the older generations regarding the necessity to protect the "purity" of the French language.

L'IDÉE DU RELATIVISME MORAL PAR RAPPORT À LA LIBERTÉ SEXUELLE EN FRANCE (THE IDEOLOGY OF MORAL RELATIVISM AS IT RELATES TO FRANCE'S LIBERAL SEXUAL CULTURE)

Astrid A. Adriaens (Dr. Olivia Choplin), Department of World Languages and Cultures

This research focuses on the influence of the civil unrest that took place across France in May 1968 and its effect on the French perceptions and attitudes regarding sexual relations outside of committed relationships. This is a topic of interest due to France's reputation of being a sexually liberal country. One example that comes to mind immediately is the French's acceptance of the sexual infidelity of their politicians such as François Mitterrand and François Hollande. Wilhelm Reich, a prominent early psychoanalyst whose ideas were popular in 1960s France, used the term "moral relativism" to explain how moral judgments are true or false only relative to some

particular perspective. This research examines how moral relativism in the realm of sexual relations was popularized during the revolution of May 68. Through a close reading of both an interview by two French writers and philosophers, Philippe Sollers and Julia Kristeva, entitled "Quand l'infidélité sauve les couples", and the film *Le Genou de Claire* by the self-proclaimed moralist Eric Rohmer, it becomes evident how much the revolution of May 68 has shaped the French's perception of sexual infidelity. These sources explore the topic of infidelity in an alternative light, treating the subject of sexual desire as natural and questioning society's fundamental morals that condemn infidelity. This research concludes that both sources exhibit the ideology of moral relativism as it relates to sexuality, which in turn reveals that May 68 has indeed affected the perception of sexual relations outside of committed relationships. By gaining an understanding of Mai 68 and the ideology of moral relativism as it relates to sexuality, we are able to better understand the roots of France's liberal sexual culture. This research will be presented in French.

LA RECHERCHE DU « MOI » DANS LES FILMS DE CEDRIC KLAPISCH (THE SEARCH FOR « ME » IN CEDRIC KLAPISCH'S FILMS)

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Cédric Klapisch's popular cinematic trilogy *L'auberge espagnole*, *Les poupées russes*, and *Casse-tête chinois* follows main character Xavier on a long journey to find himself. Via a close reading of the cinematographic text and the application of current theories of psychology, this project analyzes Klapisch's depiction of the conscious and unconscious factors that drive Xavier to discover and improve his self-concept. The unstable movement of the camera and repeated scenes in which Xavier explores his own unconscious present a vivid view into Xavier's search for his ideal self across his relationships. Throughout the trilogy, which spans fifteen years, Xavier finds himself in and out of various romantic relationships, most of them cases of his own unfaithfulness to his current partner. This research examines how Klapisch depicts Xavier's desire for women as driven by his own lack of self-esteem. For Klapisch, Xavier seeks to improve his own self-views by becoming the object of desire of the one whom he deems most desirable. As this presentation will show, the cinematography of Klapisch's three films suggests that infidelity can be a symptom of one's own efforts to find oneself. For Xavier, this cycle occurs and continues across three stages of life, resulting from either his efforts to achieve his ideal self, or a crisis of self in which he must find himself again. This research project will be presented in French.

LES REPRESENTATIONS LITTERAIRES DES CHANGEMENTS HISTORIQES DANS LA SOCIETE FRANCAISE: *LE VENTRE DE PARIS* ET *UNE VIE*

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One can learn about significant historical changes in French society through two nineteenth-century novels, *Le Ventre de Paris* (1873) by Emile Zola and *Une Vie* (1883) by Guy de Maupassant. *Le Ventre de Paris* takes place in 1858, seven years after the Coup d'Etat of 1851 and the establishment of the Second Empire under Napoleon III. *Une Vie* is set in 1883, a period when the traditional powers of the monarchy and nobility were fading in the face of a new Republic. This research examines how the plot of each text models these historical changes on a smaller scale. Florent in *Le Ventre de Paris* returns from exile to a Paris that has been completely reconstructed since his departure, reflecting the growing consumerist culture that France has

adopted under the new regime. The corrupt power of the bourgeoisie leads Florent to political action. Jeanne in *Une Vie* finds herself in an abusive marriage that will eventually lead to her ruin, despite her efforts and those of her family to improve her circumstances. Her downfall is symbolic of the nobility's lost legitimacy in political and public life. Both texts are evidence of Zola and Maupassant's overall realist approach; the authors spend much time describing the misery and hopelessness of their protagonists' circumstances. However, I argue via a close reading of the texts that the protagonists' resistance against the groups or individuals that threaten their well-being is indicative of the authors' shared belief in resisting social constructs and changes brought about by society detrimental to their livelihoods. Despite the fact that Florent and Jeanne are ultimately doomed from the onset of both novels, the fact that the authors give primary voice to characters who act against the system in place and/or individuals harming them suggests that Zola and Maupassant, while perhaps not optimistic about the end-results, argue that the endeavor to resist is honorable in its own right. This research project will be presented in French.

VOIES DIFFÉRENTES, VOIX DIFFÉRENTES: DEUX APPROCHES AU FÉMINISME DANS LE MONDE DES AFFAIRES

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In contemporary society, it is clear that the feminist movement has made positive impacts on education, working conditions, and the overall quality of life for women. Yet in the professional world, a disparity between the number of women and the number of men that work in higher paying, executive positions still exists. This research project examines the ways in which French and American businesswomen have responded to this disparity. Via the close reading of interviews given by prominent women in French and American business contexts, my analysis revealed two different approaches that French and American businesswomen have taken to the fight for equality. As revealed by the types of language these women use to talk about their own experiences, one voice seems to argue that to be able to break the glass ceiling, teamwork between women and men is a necessity and that a woman might have to change herself to fit into the business world. The second voice argues instead that the professional world should change to incorporate a woman's uniqueness instead of asking women to alter themselves. Although there are many different voices contributing to feminist thought, the two types of arguments my analyses reveal are similar to the two prominent voices that one sees in scholarly texts about the waves of feminism. My research discusses what these voices are, how they are different from each other, how they might be a product of a certain culture, and how they have impacted today's professional setting.

PORTRAITS OF PARISIANS: A LOOK AT THE GLOBAL REPRESENTATION OF THE CITY

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This research examines trends and perceptions of Paris as a city and Parisians as a people through the lens of contemporary texts on the city and its inhabitants. Through a close reading of essays by French author and entrepreneur Olivier Magny, I address the following questions: Does the prominence of Paris as a tourist destination shape the disposition of its citizens? How does Magny's textual representation of Parisians and Paris align with its overall global media representation? Do the existing stereotypes of Parsians hold any resonance, or do they lack

complete validity? I also examine the tourism aspect of Paris in this research in terms of how Paris inhabitants perceive and interact with foreigners who visit the city. In an effort to gauge a broader overall perception of various facets of the city and those who live in it, I looked at the film Paris, je t'aime (2006) and examined the various portrayals of Paris through multiple vignettes by international directors. This research project was conducted in French and will be presented in French.

CUISINE AS AN INGREDIENT OF COMEDY: AN ANALYSIS OF THE WORKS OF MOHAMED FELLAG AND HIS REPRESENTATION OF COUSCOUS AS A METAPHOR FOR SOCIETY

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Food serves as a universal, uniting force through which cultures can connect and attempt to understand one another. France is the home of a detail-oriented, traditional culinary style but has recently adapted couscous, a popular dish from French-speaking North Africa (or *le Maghreb*), as its own population's third favorite dish. With a mutual admiration for the taste of couscous, the French and *Maghrébin* people have two different understandings of its cultural significance. Mohamed Fellag, an Algerian author and stand-up comedian, uses this misunderstanding as the background for his works. He uses couscous as a metaphor for each society and points out clichés and stereotypes about the people's misunderstandings of each other using a witty, sarcastic tone. By analyzing two of Fellag's texts – a collection of ideas in his book *Comment réussir un bon petit couscous* and his stand-up comedy routine *Petits chocs des civilisations* during which he prepares a couscous on stage – along with secondary interviews with the comedian and various studies about couscous in both French and *Maghrébin* cultures, this research defines Fellag's role in comedic commentary on *Franco-Maghrébins* relations and uncovers his strength in approaching a controversial subject by using food as a vehicle for mutual understanding. In a more tangible sense, he chooses verbs and phrases that are typically used to describe food and its preparation to describe people and their actions. As an overarching theme, he shows the difference between France's adaptation – not adoption – of the dish, which is representative of the French people's distanced acceptance of the North African people. This research project will be presented in French.