Spring Undergraduate Research Forum

Welcome to SURF 2011

The Spring Undergraduate Research Forum 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, approximately 165 abstracts were submitted for presentation, and over 100 faculty members representing all disciplines on campus provided over 550 reviews of the submissions. Students were invited to present at SURF at the recommendation of that body of reviewers.

SURF is an integral part of CELEBRATE! – 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 Prof. Joel Hollingsworth
Dr. Megan Isaac Prof. Lauren Kearns
Dr. Byung Lee Dr. Kyle Altmann
Dr. Mark Kurt Dr. Mark Enfield
Dr. Meredith Allison Dr. Ryan Kirk
Dr. Yuko Miyamoto

Dr. Paul Miller, Director, 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.
# TABLE OF CONTENTS

## PROGRAM LISTING by SESSION and TIME

<table>
<thead>
<tr>
<th>SESSION</th>
<th>DATE AND TIME</th>
<th>ROOMS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>POSTER SESSION I</strong></td>
<td>(9:00am - 11:00pm; Authors Present 9:30am - 11:00am)</td>
<td>4</td>
</tr>
<tr>
<td><strong>POSTER SESSION II</strong></td>
<td>(12:00pm - 2:00pm; Authors Present 12:30pm - 2:00pm)</td>
<td>5</td>
</tr>
<tr>
<td><strong>POSTER SESSION III</strong></td>
<td>(2:30pm - 4:30pm; Authors Present 3:00pm - 4:30pm)</td>
<td>7</td>
</tr>
<tr>
<td><strong>SESSION I</strong></td>
<td>(10:40am - 12:20pm)</td>
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<td>LaRose Digital Theater</td>
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<td>KOBC 353</td>
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<td>(12:40pm - 2:20pm)</td>
<td>13</td>
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<td></td>
<td>LaRose Digital Theater</td>
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<td>KOBC 353</td>
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<td><strong>SESSION III</strong></td>
<td>(2:40pm - 4:20pm)</td>
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<td>LaRose Digital Theater</td>
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<td>KOBC 242</td>
<td>KOBC 353</td>
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</table>

## ABSTRACTS BY DEPARTMENT

<table>
<thead>
<tr>
<th>DEPARTMENT</th>
<th>NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting</td>
<td>20</td>
</tr>
<tr>
<td>Art History</td>
<td>20</td>
</tr>
<tr>
<td>Biology</td>
<td>22</td>
</tr>
<tr>
<td>Chemistry</td>
<td>29</td>
</tr>
<tr>
<td>Communications/Journalism</td>
<td>34</td>
</tr>
<tr>
<td>Computing Sciences</td>
<td>40</td>
</tr>
<tr>
<td>Economics</td>
<td>42</td>
</tr>
<tr>
<td>Education</td>
<td>46</td>
</tr>
<tr>
<td>English</td>
<td>47</td>
</tr>
<tr>
<td>Environmental Studies</td>
<td>50</td>
</tr>
<tr>
<td>Exercise Science</td>
<td>53</td>
</tr>
<tr>
<td>Foreign Language</td>
<td>60</td>
</tr>
<tr>
<td>Health &amp; Human Performance</td>
<td>62</td>
</tr>
<tr>
<td>History/Geography</td>
<td>63</td>
</tr>
<tr>
<td>Human Service Studies</td>
<td>69</td>
</tr>
<tr>
<td>International Studies</td>
<td>70</td>
</tr>
<tr>
<td>Leadership Studies</td>
<td>72</td>
</tr>
<tr>
<td>Management</td>
<td>73</td>
</tr>
<tr>
<td>Marketing</td>
<td>73</td>
</tr>
<tr>
<td>Mathematics</td>
<td>74</td>
</tr>
<tr>
<td>Music</td>
<td>74</td>
</tr>
<tr>
<td>Physics</td>
<td>75</td>
</tr>
<tr>
<td>Political Science and Public Administration</td>
<td>77</td>
</tr>
<tr>
<td>Psychology</td>
<td>80</td>
</tr>
<tr>
<td>Religious Studies</td>
<td>90</td>
</tr>
<tr>
<td>Sociology/Anthropology</td>
<td>92</td>
</tr>
<tr>
<td>Women and Gender Studies</td>
<td>93</td>
</tr>
</tbody>
</table>
**Poster Session I**
9:00am - 11:00pm; Authors Present 9:30am - 11:00am

**McKinnon Hall**

**Mary Bedard** (Dr. Lisa Ponton & Dr. Karl Sienerth)
Binding Analysis Study of Estrogenic Compounds and Humic Substances using NMR Spectra

**Amanda L. Clark** (Dr. Kathy Matera)
Understanding the Role of the Body's Immune System in Atherosclerosis through Analysis of TLR4 and Fibrinogen Interactions

**Anthony Pratt** (Dr. Kathy Matera)
The Effect of Amyloid-Beta on Acetylcholinesterase

**Julie Corbett Ronecker** (Dr. Benjamin Evans)
Temperature-Dependent Release of a Model Drug from Ferroelastomeric Microspheres for the Purpose of Targeted Drug Delivery

**Meghan R. Clark** (Dr. Antonio Izzo)
Fungal Population Response to Increased Temperatures in Soil

**Brittany Diana Corbin** (Dr. Tonya Train)
Titanium Dioxide Nanoparticle Toxicity in Neuronal Cells

**Alyssa Drosdak** (Dr. Tonya Train)
The Effect of Titanium Dioxide Nanoparticles on T-Cell Survival and Signaling

**John Furniss** (Dr. David Vandermast)
Atmospheric Pollution and Tree Core Chemistry in High Elevation Forests of Great Smokey Mountains National Park

**Katherine C. Jones** (Dr. Matthew Clark)
The Origin and Classification of the Spinal Accessory Nerve

**Jon J. Mirabito** (Dr. Antonio Izzo)
An Examination of Bacterial Associations with Ectomycorrhizae of The Elon Forest

**Alexandra Pedicone** (Dr. Antonio Izzo)
Effects of Gasoline on Soil Fungi Diversity and Composition

**Kara E. Salpeter** (Dr. David Vandermast)
Evidence for Biotic Resistance to Invasion across Spatial Scales in Riparian Forest Vegetation

**Victoria Van Vliet & Geoffrey F. Hall** (Dr. Dan Wright)
Project-Based Laboratory Development

**David Muñoz** (Dr. Joshua Kapfer)
The Impact of Human Scent on Efficiencies of Camera Traps in Wildlife Studies
Poster Session II 12:00pm – 2:00pm
12:00pm - 2:00pm; Authors Present 12:30pm - 2:00pm

McKinnon Hall

Stuart H. Batten & George Wentz (Dr. Paul C. Miller & Dr. Stephen P. Bailey)
The Impact of Varying Carbohydrate-Electrolyte Solutions on Exercise Performance in the Heat

Courtney Graham, Rachel M. Perron, Jamie R. Feldman, & Rebecca A. Moffett
(Dr. Eric Hall)
Do Exergames Allow Children to Achieve Physical Activity Intensity Commensurate with National Guidelines?

Jordan T. Lee (Dr. Wally Bixby)
The Effects of an Acute Overspeed Warm-Up on Sprint Performance in Collegiate Athletes

Krysten W. Malcolm (Dr. Caroline Ketcham)
Kinetics and Kinematics of Passé Relevé Balance in Dancers

Rachel M. Perron & Courtney A. Graham (Dr. Eric Hall)
Exergaming in Adults: Can Appropriate Intensity Levels Be Achieved for Health Benefits?

Meredith L. Ramsey (Dr. Eric Hall)
The Relationship between Personality, Motivation to Exercise, and Physical Activity Habits

Julianne A. Taylor (Dr. Caroline Ketcham)
Kinematics of Aiming Movements in 2 – 5 Year Old Children

Lindsey B. Wolson & Bridget Cashen (Dr. Caroline Ketcham)
Fine and Gross Motor Skill Development in Pre-School Aged Children

Bridget Kelly (Dr. Caroline Ketcham)
The Kinematic Differences Between Novice and Advanced Dancers when Performing Tendus, Dégagés, and Battements

Sarah A. Baker & Katelyn M. Barbiasz (Dr. Wally Bixby)
Impact of a Multi-Faceted Intervention on Increasing Physical Activity among Students on a College Campus

Stuart H. Batten & Robert B. Rosell (Dr. Wally Bixby)
Physical Activity and Exercise Adherence in College Students: The Effect of a Multiple-Psychological Theory Based Exercise Intervention

Elizabeth E. Cooper (Prof. Elizabeth Bailey)
The Effect of Supplemental Support Via E-Mail and Text Messages on Perceptions of Body Image, Self-Esteem and Social Support in 4th And 5th Grade Participants in Alamance Girls In Motion
Poster Session II....continued

Sabrina D. Fogleman, Emerald A. Graham, & Jessica A. Foust (Dr. Wally Bixby)
Motivating University Students to Exercise using the Constructs of the Self-Determination Theory

Drew Gardner (Dr. Eric Hall)
The Influence of Concussion History on Cognitive Performance in College Athletes

Andrew Genova & Francesco P. Worley (Dr. Joyce Davis)
Reliability of the Three Point Shoe Test

Justin Gianni, Hilary A. Fogle, & Emily B. Fournier (Dr. Wally Bixby)
Preventing Exercise Relapse after Spring Break

Andrew Garrison (Dr. Mark Kurt)
Impacts of Educational Attainment Risk Factors on Wages

Charles P. Smith (Prof. Dae Hyun Yoo)
"Virtual Water” and Its Effects on GDP Growth

Jennifer A Kirts (Dr. Susan Manring)
An Investigation of the Effectiveness of Extensive Sustainability Strategies on the World’s Largest Hotel Groups
Poster Session III  2:30pm – 4:30pm
2:30pm - 4:30pm; Authors Present 3:00pm - 4:30pm

McKinnon Hall

Alison Deatsch (Dr. Benjamin Evans)
Production of Magnetic Microspheres for Application in Magnetic Drug Delivery

Aaron C. Summers (Dr. Dan Evans)
Using Nasa’s Suzaku X-Ray Observatory to Study Black-Hole Accretion in the Radio-Loud Galaxy NGC-6251

Lauren Kolodrubetz (Dr. Harlen Makemson)
Cold War Cultural Influences: A Content Analysis Study of Time Advertisements

Stephanie Olsen (Dr. Nicole Triche)
Dance for the Camera

Amy Kenney (Dr. Sophie Adamson)
French and American Perceptions Regarding the Role of Social Media in Their Undergraduate Study Abroad Experience

Katherine N. Atkins (Dr. Alan Scott)
Visibility of Pedestrian Signals by Pedestrians with Varying Levels of Vision

Meghan Elizabeth Braun & Molly H. Campbell (Dr. Meredith Allison)
Undergraduates' Knowledge of North Carolina Crime

Jennifer Champ & Katy J. Milizio (Dr. Amy Overman)
A Study of the Effects of Associative Encoding in Younger and Older Adults: Improvement of Memory for Pairs

Lauren Finn (Dr. Maureen Vandermaas-Peeler)
Parental Teaching at Home: Children’s Engagement in Literacy and Numeracy While Cooking with Parents and Siblings

Charles Fleischmann (Dr. Amy Overman)
Examining the Mechanisms of Information Integration in Speech Perception

Anna L. Hulett (Dr. Patrick Rosopa & Dr. Chris Leupold)
Helping Yourself by Helping Others: An Examination of Personality Perceptions

Kelly R. Molin (Dr. Gabie Smith)
Social Perceptions of Alcohol-Risk Behaviors as Affected by Age, Gender, and Gender Role Ideology

Stephanie Alayne Robinson (Dr. Amy Overman)
The Effect of Encoding Strategies, Semantic Relatedness, and Practice on Memory

Laura Sweeney (Dr. Meredith Allison)
Crime Beliefs: Stereotypes of Criminals and Crime Victims
Poster Session III....continued

Willem Prins (Dr. Benjamin Evans)
Optimization of a Novel Material for Application in Magnetic Microactuators

Michael F. Caputo (Dr. Tonya Train)
Effects of Thimerosal on Survival and Biochemical Signaling Pathways in Jurkat T-Cells
### Session I  (10:40 am - 12:20 pm)

**LaRose Digital Theatre (Moderator: Dr. Mat Gendle)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>10:40 am</td>
<td>Megan McGrath (Dr. Mat Gendle)</td>
<td>Can the 8 Coil Shakti Alter Subjective Emotional Experience? A Randomized, Placebo Controlled Study</td>
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<td>11:00 am</td>
<td>Anna K. Stroman &amp; Danielle P. Mullin (Dr. Mat Gendle)</td>
<td>Effect of Crude Kava Root Extract on Helstead Category Test Performance in Young Adults</td>
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<td>11:20 am</td>
<td>Chris Gay (Dr. Maurice Levesque)</td>
<td>The Relationship between Online Avatar Use and Self-Discrepancy Theory</td>
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<td>11:40 am</td>
<td>Brendan J. Igoe (Dr. Maurice Levesque)</td>
<td>The Effect of Mood and Cognitive Load on Nonverbal Sensitivity</td>
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<td>12:00 pm</td>
<td>Alexandra M. Dunn &amp; Renee D. Robinson (Dr. Linda Wilmshurst)</td>
<td>How Are College Students’ Time Perception, Prospective Memory, and Self-Concept Affected by Attention Problems?</td>
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</tbody>
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**Koury Business Center 200 (Moderator: Dr. Glenn Scott)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker(s)</th>
<th>Title</th>
</tr>
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<tbody>
<tr>
<td>10:40 am</td>
<td>Brittany L. Dewey (Dr. David Copeland)</td>
<td>Network Television Broadcasting During United States Crises</td>
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<tr>
<td>11:00 am</td>
<td>Kirsten Bennett, Andre J. Smith, &amp; Samantha Baranowski (Dr. Glenn Scott)</td>
<td>Global Internet Core Values from Internet Governance Forum 2011</td>
</tr>
<tr>
<td>11:50 am</td>
<td>Paul Billings (Dr. Melody van Lidth de Jeude)</td>
<td>Culture, Communication, and Christianity: The Challenges of Contextualizing the Gospel in the 21st Century</td>
</tr>
</tbody>
</table>

**Koury Business Center 208 (Moderator: Dr. Clyde Ellis)**

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<thead>
<tr>
<th>Time</th>
<th>Speaker(s)</th>
<th>Title</th>
</tr>
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<tbody>
<tr>
<td>10:40 am</td>
<td>Jacob Chitwood (Dr. Clyde Ellis)</td>
<td>Assimilating Athletics: The Role of Football at the Carlisle Indian Boarding School</td>
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<td>11:00 am</td>
<td>Kristen Lee DelForge (Dr. Clyde Ellis)</td>
<td>A County in Crisis: A Critical Analysis of the 1988 Robeson County Newspaper Office Hostage Situation</td>
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<td>11:20 am</td>
<td>Carl W. Dagger (Dr. Clyde Ellis)</td>
<td>Lacrosse and Passports: Tribal Sovereignty in the 21st Century</td>
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</table>
Session I (10:40 am - 12:20 pm) ...continued...

**Koury Business Center 211 (Moderator: Dr. Katy Rouse)**

10:40 am  Ian J. Grady (Dr. Greg Lilly)
The Intertemporal Choice of Subprime Borrowing

11:00 am  Stephanie A Franz (Dr. Steve DeLoach)
A Re-Examination of the Environmental Kuznets Curve: A Cross-Country Analysis of the Impact of Trade and Economic Growth on Water Pollution

11:20 am  Micah P. Boomer (Dr. Katy Rouse)
Homosexual Wage Discrimination in the 21st Century

11:40 pm  Kaylyn E. Swankoski (Dr. Katy Rouse)
The Influence of School on Childhood Weight Gain

12:00 pm  Daniel Shulman (Dr. Anthony Amoruso)
The Profitability of Small-Market Baseball Teams

**Koury Business Center 242 (Moderator: Dr. Barbara Miller)**

10:40 am  James Alex Moss (Dr. Barbara Miller)
Death-Related Media’s Impact on News and Donation Preferences

11:00 am  Stephen Ferguson (Dr. Kenn Gaither)
A Church Under Fire: The Roman Catholic Church in America through Online and Social Media

11:20 am  Gabrielle Dean (Dr. Brooke Barnett)
Courage Through Faith: A Look at Religion and Immigration

11:40 pm  Carolyn Baumgarten (Dr. Vic Costello)
Chirping For Charity: How US Nonprofit Organizations are Using Twitter to Foster Dialogic Communication

**Koury Business Center 244 (Moderator: Dr. Prudence Layne)**

10:40 am  Jensen Suther (Dr. Kevin Boyle)
Joyce's Razor: A Misreading of the Divine Comedy in Ulysses

11:00 am  Caitlyn E. Byrne (Dr. Cassie Kircher)
Narrative Medicine: The Expression of Healing: an Examination of Contemporary Medical Literature Written by Physicians

11:20 am  Courtney N. McClelland (Dr. Prudence Layne)
The Aim of the Tale: Edgar Allan Poe and the Psychological Grotesque

11:40 am  Alexandra G. Hanner (Prof. Paula Patch)
So Much to Write, So Little Time: Measuring the Successes and Challenges of Community Creative Writing

12:00 pm  Morgan Ferretti (Prof. Michael Strickland)
Returning to My Italian Roots: Food and Travel Writing as Cultural Research
Session I  (10:40 am - 12:20 pm)  ...continued...

Koury Business Center 310 (Moderator: Dr. Cindy Fair)

10:40 am  Alexandra Pierce Lawrence (Dr. Cindy Fair)
“The Pediatric Social Worker Really Shepherds Them Through the Process”: Care Team Member Roles in Transitioning Adolescents with HIV To Adult Care

11:00 am  Emily Anne Wise (Dr. Cindy Fair)
“It Was Really Cool Because We Could Share Our Stories”: Assessing the Impact of a Creative Writing Group for Youth Living With HIV

11:20 am  Virginia A. Fischer (Dr. Beth Warner)
The Wake County Student Assignment Policy: The Politics and Consequences of Snubbing the Public

12:00 pm  Jack Dodson & Chas Smith (Dr. Thomas Arcaro)
The Effects of Sri Lankan Culture on Its Environment

Koury Business Center 346 (Moderator: Dr. Ryan Kirk)

10:40 am  Sam Shoge (Dr. Ryan Kirk)
The Impacts of Impervious Surface Change on Water Quality in Alamance County: 1984-2010

11:00 am  Danielle Nicole Whitman (Dr. Janet MacFall)
Enzyme Activity in the Hyporheic Region of Piedmont Streams

11:20 am  Elizabeth Winchester (Dr. Aaron Peeks)
A New Look at Environmental Attitudes: Relationships to Other Social Issues

11:40 am  Katherine Lampe (Dr. Brian Digre)
Evaluating the Success of Rural Education Initiatives and Development Projects- Sokode, Ghana: A Case Study
Session I  (10:40 am - 12:20 pm)  ...continued...

Koury Business Center 353 (Moderator: Dr. Rissa Trachman)

10:40 am  Jana Murdock (Dr. Rissa Trachman)
The Role of Environmental Degradation in Collapse as Studied Through the Ancient Maya
in the Eastern Petén Forest of Northwestern Belize

11:00 am  Brett Evans (Dr. Amy Allocco)
Jainism’s Intersection with Contemporary Ethical Movements: An Ethnographic
Examinination of a Diaspora Jain Community

11:20 am  Hannah Dowling (Dr. Amy Allocco)
New Conceptions of Motherhood: The Context and Implications of Embryo Adoption and
Donation

11:40 pm  Amanda Olmstead (Dr. Rebecca Peters)
Charity or Justice: The Response of a Faith-Based Community Organizing Group

Session II  (12:40 pm - 2:00 pm)
Session II  (12:40 pm - 2:00 pm)

LaRose Digital Theater (Moderator: Dr. Kimberly Epting)

12:40 pm    Laura Sweeney (Dr. Meredith Allison)
Decision-Making in Criminal Justice

1:00 pm      Kaya S. Forstall, Jenna R. Chenault, Kelly A. Means, & Victoria E. Hill (Dr. Alexa Darby)
Student, Faculty, and Community Members’ Motivation in Academic Service-Learning

1:20 pm      Meg Gourd & Gabrielle Newman (Dr. Alexa Darby)
Teachers’ Ways of Dealing with Emotional Situations

1:40 pm      Sarah Borowski, Elizabeth N. Palmer, Traci A. Weisberg, & Candice B. Bowers (Dr. Kimberly Epting)
Project Emo: Influences of Writing about Personal Experiences on Production and Content

2:00 pm      Julia Sage Telfer (Dr. Paul Fromson)
Self-Processes and Depression: Therapeutic Implications

Koury Business Center 208 (Moderator: Dr. Kathy Matera)

12:40 pm     Meredith N. Frazier (Dr. Kathy Matera)
Investigating the Oxidative Abilities of Amyloid-Beta

1:00 pm      Kevin Clark Harrison (Dr. Kathy Matera)
Preventing Heart Disease: Myleoperoxidase Lipid Oxidation Product Determination

1:20 pm      Hannah Grace Lane (Dr. Karl Sienerth)
Investigation of a New Method for Analysis of Explosives

1:40 pm      Anthony Rizzuto (Dr. Karl Sienerth)
Study of BMIM-Pf6 : Acetonitrile Mixtures as Solvents for Electrochemical Studies Involving CO2
**Session II  (12:40 pm - 2:20 pm) ...continued...**

**Koury Business Center 211 (Moderator: Dr. Michael Matthews)**

12:40 pm  Anna E. Powell (Dr. James Bissett)
The Decline of African American Farmers in the American South: The Role of the Land-Grant College System, the Cooperative Extension Service and the United States Department of Agriculture’s Farm Service Agency

1:00 pm  Amber M. Woods (Dr. Charles Irons)
That “Wild and Fanatical Spirit”: Controlling the Slavery Debate amongst Kentucky Evangelicals

1:20 pm  Caitlin Clarke (Dr. Scott Windham)
Judgment at Nuremberg: Defining a Society through Film

1:40 pm  Christopher Carleton Jarrett (Dr. Michael Matthews)
Hacia el Buen Convivir: Experiments in ‘Development With Identity’ in the Ecuadorian Amazon

**Koury Business Center 242 (Moderator: Dr. David Vandermast)**

12:40 pm  Gabrielle A. Burn (Dr. Brant Touchette)
Contrasting Plant-Water Relations and Performance Indexes in Two Understory Plant Species in a Coastal Maritime Forest

1:00 pm  Emily C. Adams (Dr. Brant Touchette)
Salinity Stress on Different Age Classifications of Black Needle Rush as Determined Through Chlorophyll Fluorescence

1:20 pm  Daniel R. Millemann (Dr. Brant Touchette)
Harmful Algal Blooms in Estuarine Rivers of North Carolina

1:40 pm  Stephanie Matson (Dr. David Vandermast)
Effect of Experimental Shading on a Wintergreen Plant, the Crane-Fly Orchid (Tipularia Discolor), in the Piedmont of North Carolina

2:00 pm  Lora L. Sigmon (Dr. David Vandermast)
Composition and Structure of Mature Second Growth Riparian Forests along the Haw River in Central North Carolina

**Koury Business Center 244 (Moderator: Dr. Evan Gatti)**

12:40 pm  Meg Hemmingson (Dr. Michelle Trim)
The Effects of Domesticity and Heterosexual Relationships on the Portrayal of Gender in Buffy the Vampire Slayer and Supernatural

1:00 pm Erin Day (Dr. Evan Gatti)
Theoretical Perspectives on the Nature of Art Collecting

1:20 pm Amanda B. Kennedy (Dr. Evan Gatti)
A Culture Ignored: The Looting of the Iraq National Museum

1:40 pm Maggie Pahos (Dr. Evan Gatti)
Undergraduate Study Abroad: The Approach and the Question of Transformation
Session II  (12:40 pm - 2:20 pm) ...continued...

Koury Business Center 310 (Moderator: Dr. Jason Kirk)

12:40 pm McKenzie Young (Dr. Hunter Bacot)
North Carolina: Partisanship and Ideological Changes in an Evolving Southern State

1:00 pm Kelsey E. Renner (Dr. Jason Kirk)
Politics of Power Sector Reform in Tamil Nadu and Uttar Pradesh, India

1:20 pm Catherine T. Serex (Dr. Jason Kirk)
Transcending the Security Dilemmas: A Comparative Multilevel Study of Trust in Peace Processes

1:40 pm Linda Kurtz (Dr. Laura Roselle)
Online: A Case Study of Nonprofit Communication Strategies in the United States and the United Kingdom

2:00 pm Taylor N Foshee (Dr. Sharon Spray)
Poverty and Environmental Stress: Africa in the Post-Millennium Development Goal Era

Koury Business Center 346 (Moderator: Dr. Richard Landesberg)

12:40 pm Catherine E. Reynolds (Dr. Amanda Gallagher)
Relationship-Building and Other Uses of Social Networking Tools by Nonprofit Organizations

1:00 pm Laura Schutter (Dr. Derek Lackaff)
Free Marketing Strategies for Socially Responsible Startups: A Case Analysis of Four Effective Organizations

1:20 pm Jennifer Henricks (Dr. Richard Landesberg)
The Content and Effectiveness of Social Media in Election Campaigns

1:40 pm Evann P. Clingan (Dr. Glenn Scott)
The Relationship of Participation in Online Sports Sites with Self-Identities as Fans and Commentators

Koury Business Center 353 (Moderator: Dr. Lynn Huber)

12:40 pm Elizabeth Dobbins (Dr. Evan Gatti)
Peter of Cluny: Interpreter of Islam & a History Interpreted

1:00 pm Andrew T. Black (Dr. Michael Pregill)
Rhetorical Battlefields: Examining the Dialectical Components of Islamic Intra-Sectarian Conflict and Competition in Post-Ba’athist Iraq

1:20 pm Kiva Shiri Nice-Webb (Dr. Lynn Huber)
Reconsidering the Goddess in the Saint: Reading Brigit through a Postcolonial Lens

1:40 pm Katelyn Elise O'Dunne (Dr. Jeffrey Pugh)
Female Ordination in the Anglican Church
### Session III  (2:40 pm – 4:20 pm)

**LaRose Digital Theatre (Moderator: Dr. Michael Terriblini)**

<table>
<thead>
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<th>Time</th>
<th>Speaker</th>
<th>Title</th>
</tr>
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<tr>
<td>2:40 pm</td>
<td>Erin Keim (Dr. Greg Haenel)</td>
<td>Directional Selection in the Mitochondrial DNA of Lizards Caused by Living in Extreme Environments</td>
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<tr>
<td>3:00 pm</td>
<td>Bryan A. Strelow (Dr. Greg Haenel)</td>
<td>Exploring Species Boundaries: Morphological Evidence for Interactions Between North American Cricket Frogs, Acris Crepitans and A. Gryllus</td>
</tr>
<tr>
<td>3:20 pm</td>
<td>Lauren Stranahan (Dr. Linda Niedziela)</td>
<td>Antidepressant Impairs Zebrafish Motor Development and Behavior: Ramifications of Pharmaceutical Drugs in the Environment</td>
</tr>
<tr>
<td>3:40 pm</td>
<td>V. Claire James (Dr. Michael Terriblini)</td>
<td>Peptide Binding Affinity of the Rheumatoid Arthritis Susceptibility Allele HLA-DRB1*0401 through Molecular Dynamics Simulation</td>
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**Koury Business Center 208 (Moderator: Dr. Joel Karty)**

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<th>Time</th>
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<tr>
<td>2:40 pm</td>
<td>Kelly A. Giffear (Dr. Lisa Ponton)</td>
<td>Estrogenic Activity of Wastewater Effluent in the Piedmont Triad Area Using a Four-Hour Yeast Bioassay</td>
</tr>
<tr>
<td>3:00 pm</td>
<td>Leah Krieger (Dr. Joel Karty)</td>
<td>Y-Aromaticity in the Trimethylenemethane Dianion and the Guanidinium Ion: Contributions by Resonance and Inductive Effects toward the Stability of Each Ion</td>
</tr>
<tr>
<td>3:20 pm</td>
<td>Caroline M. Peckels (Dr. Joel Karty)</td>
<td>Investigating the Role of Gallic Acid Derivatives in the Treatment of Alzheimer’s Disease</td>
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## Session III  (2:40 pm – 4:20 pm)  ...continued...

### Koury Business Center 211 (Moderator: Dr. Karen Yokley)

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker(s)</th>
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<tr>
<td>2:40 pm</td>
<td>Allison Stolte (Dr. Steven Bednar)</td>
<td>Earthquakes and Their Effect on Infant Mortality Rates in Indonesia</td>
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<tr>
<td>3:00 pm</td>
<td>Kevin Sheridan (Dr. Thomas Tiemann)</td>
<td>State Laws and Foreclosure Rates: A Brief Analysis</td>
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<tr>
<td>3:20 pm</td>
<td>Lauren Kay Flood &amp; Anna L. Hulett (Dr. Christopher Leupold)</td>
<td>The Impact of the Elon Experiences on Student Growth Outcomes</td>
</tr>
<tr>
<td>3:40 pm</td>
<td>Danica A. Shipley (Dr. Sharon Hodge)</td>
<td>The Impact of Emerging Mediums for Customer Service Delivery in Online Purchasing: A Study of Customer Satisfaction and Loyalty among College Students</td>
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### Koury Business Center 242 (Moderator: Dr. Mark Enfield)

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<tr>
<th>Time</th>
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<tr>
<td>2:40 pm</td>
<td>Jon Moore (Dr. Victoria Fischer Faw)</td>
<td>Musical Attitudes in Pre-Soviet Russia: Glazunov and the Saxophone</td>
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<tr>
<td>3:00 pm</td>
<td>Lauren Rodriguez-McCleary (Dr. Mark Enfield)</td>
<td>Why Isn't Science Being Taught? Investigating Contraints on Elementary Teachers</td>
</tr>
<tr>
<td>3:20 pm</td>
<td>Christy Zimmerman (Dr. Mary Knight-McKenna)</td>
<td>Reported Experiences of Elementary General Educators Working with English Language Learners</td>
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<tr>
<td>3:40 pm</td>
<td>Lindsay R Mann (Dr. Carolyn Stuart)</td>
<td>A Case Study Comparison of Dual Language Programs and English as a Second Language Pull-Out Programs: Differential Outcomes on Student Learning</td>
</tr>
<tr>
<td>4:00 pm</td>
<td>Kaitlyn Fay (Dr. Matthew Buckmaster)</td>
<td>The Effects of Learning Jazz Improvisation on Student Performance in Second Language Acquisition</td>
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Session III  (2:40 pm – 4:20 pm)  ...continued...

**Koury Business Center 244 (Moderator: Dr. Hui-Hua Chang)**

2:40 pm  Keelia Evans (Dr. Hui-Hua Chang)  
The Reality of Livia's Power in Imperial Rome

3:00 pm  Marissa R. Semon (Dr. Hui-Hua Chang)  
Why Were the Punishments for Adultery So Severe in Classical Athens?

3:20 pm  Megan Wynn (Dr. Hui-Hua Chang)  
The Real Spartan Military

3:40 pm  Joanna N. Rabiej (Dr. Rod Clare)  
From Betty to Peggy and Everywoman in Between: The Shift from Housewife to Career Woman in Three Leading Women’s Magazines, 1963-1978

**Koury Business Center 310 (Moderator: Dr. Duke Hutchings)**

2:40 pm  Katherine Vogt, Lauren Bradel, Christopher Andreews, Dr. Chris North, & Alex Endert (Dr. Duke Hutchings)  
Co-Located Collaborative Sensemaking on a Large High-Resolution Display with Multiple Input Devices

3:00 pm  Daniel Robert Cresse (Dr. Shannon Duvall)  
Creating a Virtual World and Navigating through It Using Gesture Recognition

3:20 pm  Andrew Z. Sutherland (Dr. Shannon Duvall)  
Exploring Data Visualization

3:40 pm  Amy Eubanks (Prof. Joel Hollingsworth)  
Catching Fireflies: A Persuasive Augmented Reality Game for Android Phones

4:00 pm  Carter Kozak (Dr. Megan Squire)  
Automated Collection of Code-Level Metrics for the Debian Package Repository

**Koury Business Center 346 (Moderator: Dr. Nina Namaste)**

2:40 pm  Abby Rosalyn Broughton (Dr. Sophie Adamson)  
Frolics in Lyon: My 6 Months in France’s Second City

3:00 pm  Jacy Lance (Dr. Donna Van Bodegraven)  
The Impact of International and Domestic Factors on the Success of the Zapatista Movement in Chiapas, Mexico
Session III  (2:40 pm – 4:20 pm)  ...continued...

3:20 pm  Melissa Kansky (Dr. Scott Windham)
Günter Grass through the Looking Glass: The Memoir of a Once Beloved Holocaust Perpetrator

3:40 pm  Amanda McBride (Dr. Nina Namaste)
Madres, Mujeres y Trabajadoras: Protesta Implícita Por Chilenas En Paula (1973-1979)
[Mothers, Women, and Female Workers: Implicit Protest by Chilean Women in Paula (1973-1979)]

Koury Business Center 353 (Moderator: Dr. Laura Roselle)

2:40 pm  Elizabeth Leman (Dr. David Crowe)
The Role of International Humanitarian Law in Three International Conflicts: World War II, Rwanda, and Sri Lanka

3:00 pm  Natalie P. Lampert (Dr. Bud Warner)
Glitter Or Gloom?: Natural Resource Extraction and Community Standards in Ghana

3:20 pm  Zachary L. Jordan (Dr. Laura Roselle)
Colonel Sanders vs. Ronald Mcdonald: A Comparative Case Study of KFC and Mcdonald's in China

3:40 pm  Catherine T. Serex (Dr. Laura Roselle)
Mediation Hegemony: The United States as a Third Party Mediator in the 1990s

4:00 pm  Kelsey L. Glover (Dr. Laura Roselle)
Ikhwan Al-Muslimin: Their Strategic Narrative and Its Metamorphosis over Time
ACCOUNTING

THE PROFITABILITY OF SMALL-MARKET BASEBALL TEAMS

Daniel J. Shulman (Dr. Anthony J. Amoruso) Department of Accounting

Our study seeks to understand how some of the least successful teams in Major League Baseball (MLB), with low revenues and low payrolls, were able to generate sizable profits in the midst of a major US recession. Unlike other major North American professional sports leagues, MLB has no salary cap and only limited revenue sharing. This has led to an ongoing source of tension in labor negotiations—the growing gap between high-revenue teams, with correspondingly high payrolls, and low-revenue teams with low payrolls. The significance of the revenue gap is magnified by the strong link between team payrolls and on-field success. For years, MLB has been secretive about the finances of individual clubs, but during the past year financial statements for certain franchises were leaked to the press and others became public through bankruptcy proceedings. One of the most surprising revelations of the newly-public information was the strong profits posted by some teams with the lowest payrolls and poorest records in the league. The timing of the release is also significant as MLB approaches the end of its current collective bargaining agreement. We are analyzing the financial statements and other publicly-available data regarding MLB team finances and performance in order to compare the strategies of small-market and big-market teams. Preliminary evidence suggests that low-revenue teams use revenues redistributed by the League to bolster their finances, rather than spending all of the funds on player salaries. The results of our study are relevant to MLB management as they consider future revenue-sharing arrangements, as well as to players and their representatives in upcoming labor negotiations. The results are also of potential interest to fans of baseball and to host cities, which are frequently pressured by teams to provide public financing for stadiums.

ART HISTORY

A CULTURE IGNORED: THE LOOTING OF THE IRAQ NATIONAL MUSEUM

Amanda B. Kennedy (Dr. Evan Gatti) Department of Art History

During the recent Egyptian Revolution, the people of Egypt stood side by side with the people of the world outraged by the looting of Egypt’s cultural treasures. The “Western” art historical community long ago adopted ancient Egypt as part of its narrative, along with ancient Greece and Rome. Because of this long tradition, the general public also thinks of them as their predecessors. This is evident by the exuberant reactions to the King Tut exhibit that toured the United States. While the ancient Near East is often included at the beginning of history and art history textbooks, it has not been adopted into Western society in the same way.

For example, there was no immediate, or united, response to the 2003 looting of the Iraq National Museum in Baghdad during the first phase of the Iraq War. Even though most of the stolen pieces originated from Mesopotamia, or the “cradle of civilization,” the lack of protection during the Iraq War demonstrates a lack of concern, or lack of awareness of, ancient Mesopotamian culture as a part of the modern Iraqi state.

Using historical precedents of protecting cultural property during wartime, including World War II and the first Gulf War, I argue that the lack of attention paid to ancient Near Eastern culture derives from the traditional art historical canon. While this concept is art historical in nature, it has permeated the “West’s” public mindset. In their article, “The Mirage of Islamic Art: Reflections on the Study of an Unwieldy Field,” Sheila Blair and Jonathon Bloom explain that, while the art historical community has tried to correct this bias against cultures that do not fit into “Western” society, it has not translated into the general public’s viewpoint. Because of this, they note that there is a separation between what Islamic scholars expect to study and what the general public expects them to study. Not until this bias is rectified, will ancient Near Eastern culture be properly defended.
THEORETICAL PERSPECTIVES ON THE NATURE OF ART COLLECTING

Erin T. Day  (Dr. Evan A. Gatti) Department of Art & Art History

The art collector is a vastly diverse, notoriously evasive, and subtly alluding character. Yet something of this enigmatic soul is imbedded and dispersed amongst the objects of a collection. Plastic Civil War statuettes (diverse in ranks of the confederacy), aluminum painted belt buckles, tea sets, Celtic crosses, and even dead, fanned out butterflies appear in clusters or groups, and reside on decorative shelves, in protective boxes, or gilded frames—It is in this profound exhaustion of visual stimulation that we find the desire of the collector; serving as a demarcation of the collector his or herself and as a perpetual reminder of the pleasure the objects serve, whether in humble count or abundance.

Theoretical perspectives on the nature and process of art collecting help locate the essence of the collector and encapsulate the meaning of their collection. Psychoanalytic theory bridges the collector’s psychological and behavioral motivations for collecting with the objects themselves, while historiographic analyses of collections such as the Kunstkamer and early twentieth-century “bric-a-brac” establish a precedent and point of comparison for understanding present-day collectors.

In this project I use the private collection of my grandfather to unveil the numerous meanings and conceptions created through the process of art collecting. The narratives shared with me by my grandfather allow me to unpack and reorganize the objects according to the theoretical and methodological frameworks. This approach will be the focus of an exhibition of the collection to be mounted in the Arts West Gallery, April 11th-15th. My SURF paper will present documentation of the exhibition including photographs and viewer responses as well as a discussion of how the display and concepts of the physical exhibit communicated these ideas about art collecting.

UNDERGRADUATE STUDY ABROAD: THE APPROACH AND THE QUESTION OF TRANSFORMATION

Maggie E. Pahos  (Dr. Evan Gatti) Department of Art and Art History

My Elon College Fellows and Lumen Prize project has been focused on the concepts of cross-cultural perception and creative expression. As part of this project, I created an exhibition last fall called A Point of Perception that attempted to process my experience surrounding and during my semester in Ghana. Through analysis of the exhibition, conversations with others on campus and reflection of my personal experience, I realized the depth of my struggle in re-integrating into my Elon lifestyle after living abroad. I am not the only Elon student who has had difficulties navigating the space between life abroad and life that is “familiar” but now changed due to the study abroad experience. For this paper I propose an extension of my original project with the specific goal of proposing an approach to the study abroad experience using my exhibition and project as a case study. I will create a “module” (including “Pre-Departure,” “While You Are Abroad,” “Upon Return,” and “Photography in Cross-Cultural Experience” sections) and an annotated bibliography that can be used by faculty and students throughout their study abroad processes. I will do this research by reading and analyzing relevant material in the aforementioned areas; by gathering resources from the Isabella Cannon International Centre (ICIC) with the aim of understanding the ICIC’s primary goals, approaches, and challenges; and by fully understanding and analyzing the ICIC’s website in conjunction with these goals. This research is important to my disciplines of art history and English (creative writing) because I will be researching the anthropology of tourism, post-colonial analysis in visual culture, and the role of written creative culture within these areas.
BIOLOGY

SALINITY STRESS ON DIFFERENT AGE CLASSIFICATIONS OF BLACK NEEDLE RUSH AS DETERMINED THROUGH CHLOROPHYLL FLUORESCENCE

Emily C. Adams (Dr. Brant W. Touchette) Departments of Biology and Environmental Studies

Coastal wetlands are important in controlling shoreline erosion, removing or filtering environmental pollutants, and providing important food and habitat for a variety of coastal organisms. These marshes are also strongly influenced by water salinities that can affect primary productivity and promote well-defined plant zonations (upper-, middle-, and lower-marshes). Nevertheless, despite its importance, the biological and physiological responses to rapidly changing salinities in salt marsh plants are not well characterized, and there is a critical need for understanding these outcomes as both sea-level rise and increased coastal storm events (due to climate change) will likely cause dramatic changes in environmental salinity in many coastal areas. Chlorophyll a fluorometry is a noninvasive process that measures photosynthetic performance in plants. In this study, polyphasic chlorophyll a fluorescence and growth measurements (biomass, leaf area, and plant height) were used to determine how increases in salinity effect different age classifications (6-, 24-, and 60 month old) of the coastal marsh plant black needle rush (Juncus roemerianus Scheele) previously acclimated to freshwater. The observed fluorescence responses were also used to derive performance indexes, which consider plant performance in light energy absorption, excitation energy trapping, and conversion of excitation energy in photosynthetic electron transport. It was hypothesized that younger plants, in the process of producing new tissues, would respond more favorably to higher salinities than older fully-mature plants with limited ability to adjust or modify to higher environmental salts. The results of this study indicate that after eight weeks of treatment, the salt treated 60-month old plants exhibited significant decreases in plant growth in comparison to controls grown in freshwater. These older plants also had significant increases in fluorescent output as both effective and potential quantum yields (i.e., the amount of absorbed energy) decreased over time. These diminished yields were also reflected in a lower performance index for 60-month old plants after five weeks of salt treatment (changes that were not observed in younger plants). Therefore, the results of this study support the hypothesis that younger J. roemerianus are better able to tolerate rapid increases in salinities than older fully-mature plants.

EFFECTS OF THIMEROSAL ON SURVIVAL AND BIOCHEMICAL SIGNALING PATHWAYS IN JURKAT T-CELLS

Michael F. Caputo (Dr. Tonya Laakko Train) Department of Biology

Humans inadvertently encounter low levels of mercury on a daily basis. Organic mercury is primarily toxic to the central nervous system while inorganic mercury is nephrotoxic. Thimerosal, an organic mercury, can rapidly decompose to form ethyl mercury. Humans are exposed to these toxins through amalgam tooth fillings, thimerosal as a preservative in vaccines and methyl mercury in fish. Havaranasab et al. (2005) has found that ethyl mercury suppresses the immune system by decreasing B and T lymphocyte cell numbers. Furthermore, it has been shown that thimerosal induces cell death at low concentrations. There has been little research on the effect of thimerosal on normal T cell growth and immune function following short term exposure at low concentrations. By investigating the response of Jurkat cells (a cultured T cell line) incubated with or without thimerosal, cell survival and the changes in growth signaling pathways were determined. Cell survival was calculated by microscopic counts. A viability dye was used to distinguish viable from dead cells. Thimerosal caused a dose-dependent decrease in cell survival and an increase in cell death over a 24 hour period. In addition, the effect of thimerosal on the MAPK signaling pathway, which is involved in normal cell growth, was examined. Short-term exposure to thimerosal did not alter activation of the MAPK growth pathway. Given that thimerosal induces cell death without altering the MAPK pathway, future experiments will investigate the mechanism by which thimerosal induces cell death in T cells.
FUNGAL POPULATION RESPONSE TO INCREASED TEMPERATURES IN SOIL

Meghan R. Clark (Dr. Antonio Izzo) Department of Biology

Fire is an important form of disturbance in forests worldwide. Fungi in the soil play important roles in these systems and are also impacted by these fires similar to the plants and animals on the surface. Some fungi are known to be adapted to survive increases in temperature, and therefore may be important in natural fire-disturbed systems as well. To understand how fungal populations respond to increased temperatures in soil, a treatment was performed in the lab that simulated the heat disturbance of a fire. Culture-based techniques were performed to compare the changes between fungal community composition and diversity prior to and after treatment. The heat treatment caused a significant decrease in number of fungi detected in the cultures. Three fungal types were isolated for further analysis because of their observed responses to the heat treatment (positive, negative, and neutral). Spores from these fungi were harvested and subjected to the same heat levels that the soils had been exposed to, and then monitored for germination and growth. Spores from the isolate that had the positive response were not impacted by the heat treatment. Spores from the other two fungal isolates were able to survive, however they showed a significant delay in their germination. Results support that the observed increase of the resistant isolate was probably not due to being more prominent in the soil, but instead managed to germinate faster and have an advantage. Knowing about the presence of resistant fungi in soil and researching their properties can give insight on how communities and ecosystems are rebuilt after a wildfire.

TITANIUM DIOXIDE NANOPARTICLE TOXICITY IN NEURONAL CELLS

Brittany D. Corbin (Dr. Tonya Laakko Train) Department of Biology

Nanotechnology is an emerging field which utilizes nanoparticles to develop new materials with improved physical, chemical, and biological properties. However, the toxicity and risk of the widespread use of most nanoparticles is unknown. Specifically, few studies have been conducted on the effects of nano-sized titanium dioxide, an active ingredient in sunscreen and many others consumer products. Uninvestigated potential hazards include the use of nano-sized TiO$_2$ as a food additive, oral digestion of lip balm containing sunscreen, and workplace exposure in factories producing these nanoparticles. Additionally, as nanoparticles are integrated into the environment through pollution, exposure via inhalation could be an issue. Since there is a potential for TiO$_2$ nanoparticles to enter the body, it is important to study the effects of these particles on cells, specifically neurons, since nanoparticles can cross the blood-brain barrier. This neurotoxicology study investigated potential adverse effects in PC12 cells, a neuronal-like cell line, by determining the effect of titanium dioxide nanoparticles on cell survival. Viability experiments were done to test cell survival. PC12 cells were cultured with or without various concentration of TiO$_2$. The number of viable cells at each TiO$_2$ concentration was then counted at 0, ~12, and ~24 hours. Trypan blue dye was utilized to differentiate live and dead cells. Results indicated a significant difference in live cell concentration from the control group at 23 hours for 50 µg/mL and 100 µg/mL TiO$_2$. No difference was seen at 10 hours. This indicates a time- and dose-dependent toxicity of TiO$_2$ nanoparticles in PC12 neuronal cells. In further experiments, neurotoxicity of zinc oxide nanoparticles will be tested along with comparing the toxicity of TiO$_2$ nanoparticles to microparticles.

THE EFFECT OF TITANIUM DIOXIDE NANOPARTICLES ON T-CELL SURVIVAL AND SIGNALING

Alyssa D. Drosdak (Dr. Tonya Laakko Train) Department of Biology

Titanium dioxide nanoparticles (TNP) are a part of many consumer products including sunscreens, cosmetics, paints and pharmaceuticals due to the long-lasting binding properties that their small size and high surface area create (Newman, Stotland and Ellis, 2009). Recently, the scientific community has raised alarm concerning the specific risks these particles might pose to human health. If ingested or inhaled, TNP particles have the potential to interact with multiple body systems as they circulate through the bloodstream. Concern for the particles’ impact on the immune system has grown as autoimmune disease and chronic inflammation become more common in the population. Early research has shown that TNP
induces T-cell death (Park et al. 2008). In the studies conducted here, T-lymphocyte cells were used to confirm the Park et al. findings of increased cell mortality and to additionally investigate TNP’s effect on cell growth regulation. To determine the effect on cell signaling, T-cells were cultured with growth factors and either treated with or without TNP for 30 minutes. After treatment, the cells were analyzed for activation of the protein ERK which is involved in signaling growth and proliferation. Western-Blot analysis revealed that ERK protein was activated by treatment with growth factors. By contrast, cells cultured with growth factors and TNP did not show ERK activation, suggesting TNP blocks growth factor activation of ERK. In summary, these results indicated that the T-cells’ ability to regulate growth and maintain viability was compromised by TNP exposure. Ongoing research will determine TNP’s effect on T-cell activation; the process by which cells divide and produce proteins important to an effective immune response.

ATMOSPHERIC POLLUTION AND TREE CORE CHEMISTRY IN HIGH ELEVATION FORESTS OF GREAT SMOKEY MOUNTAINS NATIONAL PARK

John W. Furniss (Dr. David Vandermast) Department of Biology

Atmospheric pollution from industrial activities and automobile exhausts deposit high levels of nitrogen in the high-elevation forests of Great Smoky Mountains National Park (GRSM). Although nitrogen is a nutrient for plant growth, it also acidifies soil and the effects of this acidification can cause forest decline. At pH values < 4.5, soil metals such as aluminum become mobile and can poison plant roots and clog vascular tissue. However, data indicate that high-elevation beech (Fagus grandifolia) forests in GRSM have been growing at an anomalously high rate since the mid-1970s. Our research attempts to link the high rates of nitrogen deposition to the anomalous growth through means of dendrochronological and dendrochemical analysis. We collected > 30 cores from high-elevation beech trees (and a few co-occurring species) in three plots in GRSM. In the lab, we measured the cores in 5-year increments to examine growth rates over the lifetime of the trees. This analysis indicates that the trees in this analysis grew significantly faster from the period 1950-80 than they have in the past 30 years (p < 0.05). Currently we are using Flame Atomic Absorption Spectroscopy (FAA) on 5-year segments of each core to analyze changes in their aluminum, calcium, magnesium and lead concentrations. Correlations between the results of this analysis and that of the tree growth will be presented.

PEPTIDE BINDING AFFINITY OF THE RHEUMATOID ARTHRITIS SUSCEPTIBILITY ALLELE HLA-DRB1*0401 THROUGH MOLECULAR DYNAMICS SIMULATION

V. Claire James (Dr. Michael Terribilini) Department of Biology

Rheumatoid arthritis (RA) is an autoimmune disease characterized by chronic swelling and stiffness of joint tissues and affects up to 1% of the US population. Like other autoimmune diseases, RA is caused by an adaptive immune response against self-tissues. The adaptive immune system normally functions as a specialized line of defense, recognizing specific bacterial or viral pathogens and remembering them for future encounters; however, in autoimmune diseases, white blood cells mistakenly identify normal body tissues as foreign pathogens and begin to attack these cells. Certain HLA-DRB1 alleles of MHC class II proteins have been associated with greater susceptibility to RA. The peptide binding affinity of these alleles has been studied in order to characterize their role in the immunopathogenesis of RA; however, little molecular dynamics data has been generated for these interactions. We modeled binding of the RA risk allele HLA-DRB1*0401 (DR4) with the immunodominant peptide (CII263-270) and used molecular dynamics simulations to predict the molecule’s binding affinity. We performed both peptide-bound and unbound simulations of the DR4 molecule and quantified the molecule’s movement by calculating each residue’s root mean square fluctuation (RMSF) value. Thus far, we’ve found the DR4 molecule to be stabilized by peptide binding and to show a similar peptide binding pattern to the closely related risk allele HLA-DRB1*0101 (DR1). We also ran a series of simulations in which each of the 9 amino acids of the CII peptide was individually mutated to alanine, and calculated the resulting RMSF values. From this data, we expect to be able to identify key areas for binding on the DR4 allele and to see marked changes in the peptide’s binding affinity to DR4, corresponding to higher or lower risk of RA.
“THE ORIGIN AND CLASSIFICATION OF THE ACCESSORY NERVE”

Katherine C. Jones (Dr. Matthew Clark) Department of Biology

In humans, the eleventh cranial nerve (CN XI), the accessory nerve, controls movement of the Trapezius and Sternocleidomastoid muscles. Studies have shown that both muscles are derivatives of neuro cranial branchial arches, however, the derivation of the accessory nerve is not yet decided upon. Similarly, the classification of the type of information carried by the accessory nerve is highly disputed. This study addresses and provides further insight into this dilemma by using two approaches: analyzing and synthesizing existing research as well as benchtop dissection and analysis of the accessory nerve within humans. The pedagogical approach explores previously existing research in order to analyze the classification types of information carried by the accessory nerve as well as its’ origin. Three schools of thought are revealed. First, some research suggests that only a portion of CN XI, the cranial component, descends as a branchial arch derivative from the medulla oblongata, with special visceral efferent (SVE) nerve fibers. Furthermore, it is suggested that these SVE fibers quickly join the tenth cranial nerve SVE fibers and project to neck structures to implement similar neurological controls. The second commonly accepted theory asserts that fibers which form the spinal component of CN XI originate from the spinal accessory nucleus located in the lateral horn of the spinal cord. Investigators suggest these fibers contain general somatic efferent (GSE) nerve components. Finally, research suggests that all spinal accessory nerve fibers arise from the spino-medullary junction and are all GSE nerve fibers in origin. Pedagogy data related to each of the three theories was collected. These pedagogy results are from both human studies as well as from other organisms. Conclusions regarding the most likely origin and classification of CN XI according to pedagogy research are drawn. These results indicate that spinal accessory nerve carries GSE nerve fibers, primarily. This conclusion is supported by the benchtop portion of this study. This involves gross dissection, identification, and tracking of accessory nerve fibers within 3 human donor specimens. The injection of methylene blue within CN XI allows for tracking of this nerve to its’ origin. The dissections suggest that both the cranial and spinal portions of the accessory nerve may arise from the spino-medullary junction and are all GSE in origin. Therefore, the pedagogy and bench studies suggest that the branchiomeric muscles migrate into the peripheral somatic area and are thus innervated by the GSE component of CN XI. These human donor specimens provide a visual descriptive component of the adult innervations of the accessory nerve. However, further developmental studies and more human donor specimens need to be investigated to gain conclusive classification of the type of neural information carried by CN XI.

DIRECTIONAL SELECTION IN THE MITOCHONDRIAL DNA OF LIZARDS CAUSED BY LIVING IN EXTREME ENVIRONMENTS

Erin A. Keim (Dr. Gregory Haenel) Department of Biology

Sequence variation in mitochondrial DNA (mtDNA) was traditionally considered to be selectively neutral, meaning mutations in the DNA had no effect on proteins function. However, recent evidence found that mtDNA may be under directional selection. This research focuses on the mtDNA sequence of two lizard species that live in the Southwest: the tree lizard, Urosaurus ornatus, and the long-tailed brush lizard, Urosaurus graciosus. Under the neutral selection theory, all differences in the mtDNA sequence of these two species should have no effect on their ability to survive. However, lizards are ectotherms that must use external means to control their body temperature. Urosaurus ornatus uses the shade of rocks and trees in order to keep from overheating. Urosaurus graciosus lives in desert flats with higher temperatures and fewer places to escape the extreme heat. Urosaurus graciosus appears to deal with these higher temperatures by maintaining an increased metabolic rate, which is controlled to a large degree by the mitochondria. Our hypothesis explores the possibility of directional (non-neutral) selection within the mtDNA of Urosaurus graciosus for modifications to their genes that would promote survival at the elevated temperatures. We predicted that Urosaurus graciosus would have a greater number of non-neutral mutations that would change the actual protein code. To determine selection, sequence from both species was collected for comparison. Polymerase Chain Reaction (PCR) was used to amplify five specific genes: CytB, 16S, ATP6, ND4, and ND1. These genes were sequenced using a Beckman-Coulter GenomeLab GXP Genetic Analysis System or were collected from GeneBank, a database containing published DNA sequences. In total, about 10,680 base pairs were collected for the two species. Using the Molecular Evolutionary Genetics Analysis (MEGA) computer program, the sequences were compared to determine
where mutations are located in the mtDNA and the type of mutations present. Preliminary analyses indicate a clear signal of directional selection in the *Urosaurus graciousus* mtDNA. This study will contribute to the knowledge about evolution and selection within the mitochondrial genome, the effect of environment on mutation, and the deeper understanding of the role that mitochondria function and dysfunction plays in all organisms, including humans.

**EFFECT OF EXPERIMENTAL SHADING ON A WINTERGREEN PLANT, THE CRANE-FLY ORCHID (**_Tipularia discolor_)** IN THE PIEDMONT OF NORTH CAROLINA

**Matson, Stephanie** (Dr. David Vandermast), Department of Biology

Crane-fly orchid (*Tipularia discolor*) is a wintergreen herb commonly found in the understory of deciduous woodlands in the eastern part of the United States. It produces one leaf per plant, which emerges each fall and photosynthesizes during the winter, dying back when leaves on canopy trees emerge in spring. One effect of global warming is that deciduous forests retain their leaves longer each fall and gain them earlier each spring, which shortens the canopy free period for Crane-fly orchid photosynthesis. The inflorescence of this plant emerges in late summer, independently of its leaves. To determine the effect that the reduction in leaf-free period might have on Crane-fly orchid, we experimentally shaded 20 Crane-fly orchids in the Piedmont of North Carolina in February 2010 and again in winter 2010-11. During summer and early fall and of 2010 we measured fecundity (inflorescence emergence date, death date, emergence period, height, and number of flowers). Results of this analysis indicate that the spring 2010 shading did not affect fecundity. Given that *T. discolor* stores photosynthetic products in underground corms, this result was not unanticipated. We are currently measuring *in situ* biochemical markers of stress using a PAM fluorometer and will measure chlorophyll a/b ratios using spectrophotometry. We hypothesize that shading will result in significant measures of leaf stress such as an increase in chlorophyll b production. Results of the leaf stress measures will be presented.

**HARMFUL ALGAL BLOOMS IN ESTUARINE RIVERS OF NORTH CAROLINA**

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Globally, there are more than 75 species of planktonic algae that can form dense populations (or blooms) within surface waters and are known to release toxins. These blooms often have deleterious effects on natural aquatic systems by promoting fish kills, contaminating shellfish, and fostering periodic declines in light and oxygen within the water-column. While high nutrients (nitrogen and phosphorus) have long been held as primary mechanisms for promoting and maintain harmful algal populations, few studies have considered the importance of other causative factors. Therefore, the purpose of this study was to better understand the conditions that initiate and sustain harmful algal blooms in three coastal rivers of North Carolina (Neuse, Pamlico, and New Rivers). This involved analyzing a 10-year data set using multivariate analyses to compare cell densities with ambient physiochemical parameters. The results indicate that over the ten year period, often dynamic inter-annual fluctuations in cell densities were observed in three harmful algal taxa - the cyanobacterium *Cylindrospermopsis raciborskii* and the dinoflagellates *Karlodinium micrum* and *Prorocentrum minimum*. *C. raciborskii* tended to have strong temperature responses as it frequently bloomed during mid- to late summer (July to September) between 2005 and 2009. In contrast, *P. minimum* favored the cooler temperatures of winter and early spring (December to April), especially in 2006 and 2007. *K. micrum*, however, was prevalent throughout most of the study during all seasons. Nevertheless, peak abundances of *K. micrum* did occur between June 2001 and February 2002, March through October in 2006, and January 2008 through June 2009. In the Pamlico and Neuse Rivers salinity was determined to be an important factor in shaping algal populations. In the Neuse and New Rivers, nutrients (such as ammonium, nitrate, and phosphorus) were also important predictors of harmful algal blooms.
AN EXAMINATION OF BACTERIAL ASSOCIATIONS WITH ECTOMYCORRHIZAE OF THE ELON FOREST

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The vast majority of plants form mutual symbioses, called mycorrhizae, with a variety of fungal species. In such symbioses each organism is often highly dependent and influenced by the well being and activities of the other. Therefore, the study of mycorrhizae is critical to people from many fields, especially those who are trying to promote plant health and productivity, and most of the research surrounding this has focused on the interactions between the fungi and the plants. However, much less is known about the interactions of soil bacteria and mycorrhizae. The goal of this research project was to compare and contrast the populations of bacteria that can be isolated from individual mycorrhizal root tips from different mycorrhizal fungi and from oak and pine trees within the Elon forest. Culture-based analyses of bacterial populations that associate with ectomycorrhizae from the Elon forest were conducted during the fall semester of 2010. It was discovered that there is extremely high variability between the types and numbers of bacteria that were associating with the ectomycorrhizae. This finding was true when the comparison was between bacteria that associated with a specific type of fungus on an oak tree or a pine tree, and when the comparison was between bacteria that associated with different fungi on a specific type of tree. These results indicate that specific species of bacteria may not have critical roles for certain mycorrhizae. While no clear patterns of bacterial abundance were observed, 6 unique strains of actinobacteria were isolated from the mycorrhizae. Actinobacteria are well known for their capacity to produce antibiotic compounds. To test for antibiotic production, these isolates were cultured in the same media with 4 unique species of bacteria representing a variety of morphological features. By cultivating the actinobacteria on the same plates as the tester strains, it was found that the actinobacteria were producing a diversity of antibiotics that differentially affected Gram positive and Gram negative bacteria. These properties bring up the possibility that the actinobacteria maintained around the mycorrhizae could have direct impacts on the interactions of the mycorrhizae with other soil microbes.

EFFECTS OF GASOLINE ON SOIL FUNGI DIVERSITY AND COMPOSITION

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Gasoline and other products derived from crude oil are in widespread, daily use, and they may often contaminate soils and affect the organisms found therein. Though much literature exists on the subject of gasoline and hydrocarbon effects on bacteria, less is known about the effects on fungal communities. This research examined the change in fungal viability and community composition in the soil in response to gasoline exposure. In order to assess these variables, soil was taken from Elon Forest and exposed to various treatments in a laboratory setting. These treatments included 1) exposure to gasoline vapor and 2) exposure to different concentrations of liquid gasoline. Fungi that survived were then quantitated, characterized, and individually isolated by plating the soils on fungal-specific media. In order to compare compositional changes due to the treatments, fungi were distinguished based on their physical characteristics (e.g. color and form) seen when grown in culture. Exposure to vapor significantly reduced the number of fungi that grew from the treated soil. In addition, a dramatic change in species composition resulted. The fungi showed a clear response to the liquid treatments, with the least number of fungi growing from the soil exposed to the higher concentrations of gasoline. Four specific fungi were found to respond differently to the liquid gasoline treatment, either increasing or decreasing in their abundance relative to the other fungi. Collectively, these results imply that exposure to gasoline impacts fungi in the soil both by reducing the overall number of viable fungi and differentially affecting certain species.

EVIDENCE FOR BIOTIC RESISTENCE TO INVASION ACROSS SPATIAL SCALES IN RIPARIAN FOREST VEGETATION

Kara E. Salpeter (Dr. David Vandermast) Department of Biology

Charles Elton’s biotic resistance hypothesis suggests that areas that are rich in native species are more resistant to invasion. Our research tests Elton’s hypothesis for accuracy in a riparian forest environment.
Riparian forests are regularly scrubbed by floodwaters, which can remove existing species and deposit seeds of invasive ones. Our work involves collecting data from 41 vegetation survey plots along the Haw River in the Piedmont of North Carolina. In this study, we 1) report on the identity and frequency of invasive species encountered in the watershed, and 2) report on the average cover of invasive species, and 3) examine the relationship between native and invasive species richnesses across spatial scales ranging from 0.01 m² to 100 m². Of 249 species identified, 31 (12.4%) were invasive. The most frequent invasive species were still grass (*Microstegium vimineum*: 92.7%), Japanese honeysuckle (*Lonicera japonica*: 73.2%), and ground ivy (*Glechoma hederacea*: 61.0%). At all scales (0.01 m² - 100 m²) there was a negative relationship between native and invasive species diversity, however none of the results were significant, (R²-values ranging from 0.06 to 0.001). Furthermore, at smaller scales (0.01 m²) the negative relationship is stronger than at larger spatial scales, which suggests that at small scales the presence of any species will exclude the establishment of any other species. Our data indicate that invasive species have successfully established themselves in Haw River riparian forests and that there is no evidence for biotic resistance.

**COMPOSITION AND STRUCTURE OF MATURE SECOND GROWTH RIPARIAN FORESTS ALONG THE HAW RIVER IN CENTRAL NORTH CAROLINA**

**Lora L. Sigmon** (Dr. David Vandermast) Department of Biology

The Haw River drains a watershed encompassing important central North Carolina cities within its > 1500 mi². The river is historically important as a source of hydropower for numerous textile mills and demand for raw materials in the region means that virtually all of its riparian forests were harvested at some point in the past. There is much interest in maintaining a healthy riparian buffer along the river that can be used for recreational purposes and to enhance the quality of water that flows from the Haw into Everett B. Jordan reservoir. The purpose of our study was to document the composition and structure of Haw River riparian forests with special interest in invasive species in this highly modified landscape. We established 45 vegetation survey plots in areas containing mature forest. We found 49 woody species (including important shrubs and vines > 2.5 cm DBH) of which 4 were invasive: Chinese privet (*Ligustrum sinense*), Tree-of-heaven (*Ailanthus altissima*), Russian olive (*Elaeagnus umbellata*), and Japanese honeysuckle (*Lonicera japonica*). Five species represented over 53% of all woody stems: boxelder (*Acer negundo*), sweetgum (*Liquidambar styraciflua*), green ash (*Fraxinus pensylvanica*), southern sugar maple (*Acer barbatum*), and yellow-poplar (*Liriodendron tulipifera*). Despite representing 8% of all species found in Haw River riparian forests, invasive species represented only 0.75% of all woody stems by abundance. Our results suggest that, in the stratum of woody plants > 2.5 cm DBH, Haw River riparian forests have been resistant to invasion. Possible reasons for this will be presented.

**ANTIDEPRESSANT IMPAIRS ZEbraFISH MOTOR DEVELOPMENT AND BEHAVIOR: RAMIFICATIONS OF PHARMACEUTICAL DRUGS IN THE ENVIRONMENT**

**Lauren W. Stranahan** (Dr. Linda Niedziela) Department of Biology

Antidepressants are one class of drug used for the treatment of human psychological conditions that work by altering brain chemistry. They are one of the most widely prescribed drugs and have been found contaminating surface water in the US and internationally. Fluoxetine (Prozac™) is one popular antidepressant that increases serotonin levels in the human brain and has been detected in rivers at concentrations in the ng/L range. Previous studies have found that high concentrations of fluoxetine permanently impaired the swimming activity of zebrafish exposed embryonically. In this research, zebrafish larvae were exposed acutely to concentrations similar to previous studies and chronically (over the course of several weeks) to several lower concentrations designed to better approximate environmental levels. Swimming activity was monitored by counting number of lines crossed in a testing arena and by using video tracking software (TopScan LITE) to detect any suppression in swimming activity through measurements of velocity and total distance traveled. Our data confirmed previous acute studies by demonstrating that larvae (6-14 days post fertilization) crossed significantly fewer lines in the testing arena than did controls. This investigation also revealed that despite an overall suppression in activity levels,
larvae are still capable of eliciting a brief but robust escape response to an artificial predator. The two methods for assessing activity levels were additionally compared, with the software being far more sensitive to larval movement but with consequently higher levels of variation.

**EXPLORING SPECIES BOUNDARIES: MORPHOLOGICAL EVIDENCE FOR INTERACTIONS BETWEEN NORTH AMERICAN CRICKET FROGS, ACRIS CREPITANS AND A. GRYLLUS**

Bryan A. Strelow (Dr. Gregory Haenel) Department of Biology

Genetic interaction often occurs when two closely related species come into contact. This interspecific gene-flow can lead to stable coexistence or local extinction. Due to climate change, many species’ ranges are shifting; a phenomenon which brings previously isolated species together. This is evident within the NC piedmont where the range of the northern cricket frog, Acris crepitans, and its southern counterpart, A. gryllus, overlap. This study seeks to establish the evolutionary interactions between these groups of frogs. Identifying these specific relationships will allow me to determine the evolutionary history and trajectory of these species, which is important for conservation in light of the global trend of declining amphibian populations. Utilizing morphology as an indicator of the genetic interaction within this overlap region, I can identify the exchange of genes (or lack thereof) through the comparison of species specific morphological characters. To do this, I compared 8 physical traits (including snout-to-vent length, leg measurements, etc.) from 94 specimens obtained from the NC Museum of Natural Science. These specimens were taken from 4 populations: 1 population from the edge of each species’ range within the overlap zone and 1 isolated control population from each species. By comparing species’ traits from inside the overlap zone to control populations, I was able to determine whether these traits varied in response to heterospecific interactions. These results were quantified using two models. One model of species divergence explains a significant interspecific difference in trait expression as a factor of independent evolution and limited gene-flow. The alternative model of convergence explains decreasing phenotypic variation (blurring of species boundaries) by hybridization. A comparison of means and medians using Holm-Sidak and Fischer’s Exact Tests demonstrate that 4 of the 8 characters measured support a hypothesis of divergence, while the other 4 traits indicate convergence. These results clearly indicate that both species are affected by cohabitation. The mixed results likely indicate recent or ongoing genetic exchange and suggest several avenues for further investigation. Currently, I am moving forward with genetic analyses in order to resolve the patterns within these interactions and quantify how much gene-flow is taking place.

**CHEMISTRY**

**BINDING ANALYSIS STUDY OF ESTROGENIC COMPOUNDS AND HUMIC SUBSTANCES USING NMR SPECTRA**

Mary C. Bedard (Dr. Ponton and Dr. Sienerth) Department of Chemistry

This study characterizes binding between estrogens, known endocrine disruptors, and humic substances using NMR. Humic substances occur naturally as the result of biodegradation of formally living tissues. Current estrogen analytical techniques involve solutions that inherently contain humic substances, but such substances bind with estrogens and interfere with estrogen concentration estimates, especially in compounds present in water effluents. To accurately survey estrogen concentrations, the long-term interaction between estrogens and humic substances must be determined. If estrogens only weakly bind to humic substances, these can later dissociate in the environment or after consumption, thus resulting in higher effective concentrations of estrogens than established, which poses a significant health risk. Thus far the research has focused on experimentally collecting and analyzing proton and carbon NMRs of estrogens and humic substances individually to provide a baseline set of spectra. Additional studies involve a special NMR method that prevents interference by the solvent (in this case, water) so that high quality spectra can be obtained. In the long run, this study aspires to answer questions surrounding the validity of current estrogen analytical techniques at various concentration levels and persistence of these levels post consumption.
UNDERSTANDING THE ROLE OF THE BODY’S IMMUNE SYSTEM IN ATHEROSCLEROSIS THROUGH ANALYSIS OF TLR4 AND FIBRINOGEN INTERACTIONS

Amanda L. Clark, (Dr. Kathryn M. Matera), Department of Chemistry

Recent research has identified the body’s inflammatory response as a major contributor to the build-up of arterial plaques. Cellular receptors within the body, in particular toll-like receptors (TLRs), may hold the key to combating plaque formation. In particular, toll-like receptor 4 (TLR4) has been shown to interact with fibrinogen, a small protein that is important in blood coagulation, and help signal inflammatory molecules to the site of plaque formation. This interaction fuels the formation and progression of plaques. The mechanism by which TLR4 and specifically fibrinogen interact could hold the key to eradicating many of these interactions. The binding of TLR4 and fibrinogen was examined through gel electrophoresis, Western blot analysis, and column purification methods. Amino acid derivitization of the TLR4 protein was also used to pinpoint the locations necessary for binding to fibrinogen. Once the specific location of binding is determined, inhibitors can be synthesized in the future to prevent TLR4 and fibrinogen from interacting, thus lessening the body’s detrimental immune response to atherosclerotic plaques.

INVESTIGATING THE OXIDATIVE ABILITIES OF AMYLOID-BETA

Meredith N. Frazier (Dr. Kathryn M. Matera) Department of Chemistry

The oxidative abilities of amyloid beta (Aβ), the peptide which forms the characteristic plaques of the neurodegenerative disorder Alzheimer’s disease (AD), were investigated. Finding the exact mechanism by which Aβ-mediated oxidation happens could lead to a better-designed drug to retard the progression of this debilitating disorder. This was accomplished by looking at the effect of Aβ on enolase, a molecule with metabolic import in the brain, through assessment of oxidative markers by gel electrophoresis, Western and dot blots, and its effect on NADH (a model molecule) through UV-VIS spectrophotometry. The effect of copper—a metal hypothesized to play a key role in AD—on the ability of Aβ to oxidize biomolecules was also examined using the same methods. Data shows that Aβ can oxidize enolase, and that the presence of copper with Aβ leads to an increase in oxidation.

ESTROGENIC ACTIVITY OF WASTEWATER EFFLUENT IN THE PIEDMONT TRIAD AREA USING A FOUR-HOUR YEAST BIOASSAY

Kelly A. Giffear (Dr. Lisa M. Ponton) Department of Chemistry

The presence of estrogens in wastewater effluent has been attributed to the cause of various reproductive issues in aquatic organisms. Since estrogens are not regulated in wastewater treatment plants (WWTPs), many escape the WWTPs into the environment. Additionally, the interaction of humic substances and estrogens in wastewater effluent has recently come under investigation due to the suspected interference of humic substances with analytical techniques to determine estrogen levels. This is problematic because the level of estrogens present in water may be inaccurately characterized. Even more important than the concentration of estrogens is the estrogenic activity or the level of estrogens that is biologically available. The addition of a yeast bioassay, which can determine estrogenic activity is an important extension of this research. Recombinant yeast is modified to detect DNA changes caused by the presence of estrogens. This models the DNA in aquatic organisms in contact with wastewater effluent. Modifications were made to the yeast to enable detection of estrogenic compounds through the emission of visible light, which can be detected using a luminometer. The four commonly found estrogens in wastewater, 17α-ethynylestradiol, estriol, 17β-estradiol, and estrone, will be examined with the addition of humic substances to determine the impact the humic substances have on the bioassay. Through this process, it is hypothesized that the interaction of humic substances will dampen the estrogenic activity of the wastewater effluent collected from the sections of the Haw River in the Piedmont Triad area. The proposed project involves the application of a recently published four-hour yeast bioassay for estrogenic activity to both analyze...
wastewater effluent in the Piedmont Triad area and to further characterize the impact of humic substances on estrogen analysis.

PREVENTING HEART DISEASE: MYLEPEROXIDASE LIPID OXIDATION PRODUCT DETERMINATION

Kevin C. Harrison (Dr. Kathryn M. Matera) Department of Chemistry

Heart disease may occur because oxidation of low-density lipoproteins (LDL), which are protein carriers for cholesterol, prior to uptake by cells can cause the cells to later release their load of cholesterol. Three lipids found in LDL, arachidonic acid, oleic acid, and linoleic acid, were examined for the ability to be oxidized by myeloperoxidase (MPO) in the presence of hydrogen peroxide. Myeloperoxidase is known to be involved in the formation of arterial plaques in the presence of LDL, and therefore understanding the mechanism of the oxidation of these lipids affords insight into the progression of heart disease. Oxidized lipid structures were determined using various instrumental methods including nuclear magnetic resonance and gas chromatography-mass spectrometry. The results indicate that the carbon chain of the lipids is being oxidized at a position adjacent to two double bonds known as the allylic position, although further research is necessary to conclusively confirm this result.

Y-AROMATICITY IN THE TRIMETHYLENEMETHANE DIANION AND THE GUANIDINIUM ION: CONTRIBUTIONS BY RESONANCE AND INDUCTIVE EFFECTS TOWARD THE STABILITY OF EACH ION

Leah L. Krieger (Joel M. Karty) Department of Chemistry

“Y-aromaticity,” a unique stabilization property for molecules, has been debated for over 30 years. Y-aromaticity is related to “aromaticity,” a well-established stabilization phenomenon. A molecule is “aromatic” if it has a particular number and type of electrons arranged cyclically. Molecules that are purported to be “Y-aromatic” have the appropriate number and type of electrons, but those electrons are arranged in a Y-shape. Three molecular species that fit this description of Y-aromaticity are the trimethylenemethane dication (TMM$^{2+}$), the trimethylenemethane dianion (TMM$^{2-}$), and the guanidinium ion (GD$^+$. GD$^{2+}$ is particularly interesting, because it comprises part of arginine. Of all 20 amino acids, arginine is the strongest base, which gives it special biochemical roles in cell recognition and cell division. Arginine’s ability to act as a base would be explained by an unusual stability from the guanidinium ion portion of the molecule, which, in turn, could be explained by Y-aromaticity. Some previous studies have supported the existence of Y-aromaticity in these molecular species, while others have cast doubt. A major problem with studies that have cast doubt has been the fact that such studies have examined total stability of the molecules of interest. However, in each case, total stability has simultaneous contributions by two separate effects—“resonance effects” and “inductive effects.” Importantly, it is only the resonance effects that correspond to aromaticity. In this study, the separate contributions by resonance effects and inductive effects have been determined, using a vinylogue methodology developed previously by Karty. This methodology utilizes a commercial computer program, called Gaussian 03, to calculate the energies of the molecules of interest, as well as derivatives of these molecules, called “vinylouges.” In the vinylouges, contributions by resonance effects can be isolated from those by inductive effects, and therefore were determined directly. Extrapolating the trends that are observed involving the vinylouges, the contribution by resonance was extrapolated to obtain the contributions in the respective molecules of interest: 46.0 kcal/mol for TMM$^{2+}$, 55.6 kcal/mol for TMM$^{2-}$, and 52.2 kcal/mol for GD$^{2+}$. These numbers are significantly greater than for each molecule’s linear counterpart, which is consistent with the notion of Y-aromaticity in these species.

INVESTIGATION OF A NEW METHOD FOR ANALYSIS OF EXPLOSIVES

Hannah G. Lane (Dr. Karl Sienert) Department of Chemistry

At the scene of an explosion, investigators collect residue samples and send them back to the lab for analysis. This analysis reveals specific concentrations of components of the explosive, which can spark investigation of certain groups of interest through links in federal databases. Current lab methods require...
expensive instrumentation and methodology, and can take up to 48 hours to process. It is the objective of much forensic research to develop a method of measuring explosives directly at the scene, allowing the criminal investigation to begin right away. The majority of this research utilizes a method called fluorescence quenching (FQ), which involves excitation of a solution containing explosive substances such as TNT and PETN using a light source (such as a laser), then measuring the light the solution emits. The explosives have the ability to “quench,” or decrease, that emission of light by varying degrees depending on concentration. While FQ has shown some success as an on-site analytical method, it is very expensive and it requires complete blackness, which can be difficult to achieve. A method similar to fluorescence, electrochemiluminescence (ECL), shows promise as an inexpensive approach that could be employed on-site without the expense of a laser or need for pitch-black environment. In ECL, the solution is excited not by a light source but by applying an electrical pulse. This presentation will describe recent research into a method that quantifies the ECL signal observed from a solution of tris(bipyridine) ruthenium(III), [Ru(bpy)$_3$]$^{2+}$. A linear relationship was observed between concentration of added explosive quencher and associated signal reduction. The concentrations of [Ru(bpy)$_3$]$^{2+}$ required to achieve an analytically significant signal and meaningful calibration sensitivity were determined using ferricyanide as a model quencher. The parameters determined were then employed in test systems with TNT. Initial results indicated a quenching efficiency, and therefore sensitivity, more than 50% higher than that seen in many fluorescent methods. These results indicate that ECL is a promising new, less expensive on-site method for quantification of explosive substances.

**INVESTIGATING THE ROLE OF GALLIC ACID DERIVATIVES IN THE TREATMENT OF ALZHEIMER’S DISEASE**

Caroline M. Peckels (Dr. Joel Karty and Dr. Kathryn Matera) Department of Chemistry

Alzheimer’s disease (AD) is a neurodegenerative disorder that primarily affects the elderly. There are numerous hallmarks of Alzheimer’s disease including holes in the brain, low levels of acetylcholine (a neurotransmitter that is linked to memory), amyloid beta plaques (which are insoluble deposits that are found within the brain of people with Alzheimer’s), and oxidative stress (which is when unstable molecules called free radicals outweigh the antioxidants needed to remove these unstable molecules). In people with Alzheimer’s, low levels of acetylcholine have been found as well as amyloid-beta plaques. Current drugs on the market only focus on alleviating one of these characterizes at one time. Usually, these drugs focus on preventing the breakdown of acetylcholine. However, this research project focuses developing compounds that alleviate multiple problems at once, which is something of great interest to pharmaceutical companies.

Compounds found in walnuts (specifically gallic and ellagic acid) have been shown to alleviate several characteristics of AD at one time. Using standard biochemical techniques, compounds similar to gallic acid were studied to determine their ability at inhibiting the breakdown of acetylcholine. The standard biochemical techniques include enzyme kinetic assays and Congo Red assays. It was determined that four out of the ten compounds studied successfully inhibited acetylcholinesterase. These compounds were then tested to determine their ability at preventing the formation of amyloid-beta plaques. It was concluded that several compounds were able to stop the breakdown of acetylcholine and prevent the formation of plaques. These compounds also have antioxidant properties. Through this study, multifunctional compounds that can alleviate several symptoms of Alzheimer’s at once were determined successfully determined and a mechanism for this multipotent ability of the compounds was proposed.

**THE EFFECT OF AMYLOID-BETA ON ACETYLCHOLINESTERASE**

Anthony T. Pratt (Dr. Kathryn Matera) Department of Chemistry

The effect of binding the protein amyloid beta to the enzyme acetylcholinesterase on inhibition of the enzyme’s activity in breaking down acetylcholine, a neurotransmitter, was examined. This research is important because low levels of acetylcholine and the presence of amyloid beta in the brain are characteristic of Alzheimer’s disease. In patients with Alzheimer’s, the protein tangles together and aggregates, which possibly causes the death of neurons (brain cells). This research investigated whether or not the amyloid beta (aggregated and unaggregated) inhibits acetylcholinesterase from breaking down acetylcholine and thus preserves what little is left of the neurotransmitter in Alzheimer’s patients.
results would reveal an important connection between these two factors of Alzheimer’s disease. UV-vis spectroscopy and gel electrophoresis were used to examine the interactions between amyloid beta and acetylcholinesterase. The results were that unaggregated amyloid beta binds to the enzyme so that its enzymatic activity is inhibited significantly. The aggregated amyloid beta did not show as much significant inhibition.

**STUDY OF BMIM-PF$_6$ : ACETONITRILE MIXTURES AS SOLVENTS FOR ELECTROCHEMICAL STUDIES INVOLVING CO$_2$**

*Anthony M. Rizzuto* (Dr. Karl D. Sienerth) Department of Chemistry

Over the past 50 years, room-temperature ionic liquids (RTILs) have been of great interest to researchers as potential green solvents and because they are inherently electrically conductive. Additionally, many RTILs exhibit an extraordinary ability to dissolve carbon dioxide gas (CO$_2$). Taken together, those two facts would imply that RTILs would be ideal for performing electrochemical studies (using electricity to control and/or observe chemical reactions) involving CO$_2$, but the high viscosity of RTILs inhibits such studies. This presentation will describe studies focused on combining the RTIL 1-butyl-3-methylimidazolium hexafluorophosphate (bmim-PF$_6$) with a common organic solvent (acetonitrile) to decrease its viscosity while retaining its desirable characteristics. A series of mixtures ranging from 0% to 100% by volume acetonitrile in bmim-PF$_6$ were investigated to identify an optimum ratio for use in electrochemical studies involving CO$_2$. Density, viscosity and conductivity were measured for the range of binary mixtures and compared to previously published data. The electrochemistry of a model compound, azobenzene, was studied as well. The data indicated that a binary mixture containing 15-20% by volume acetonitrile in bmim-PF$_6$ was optimal for electrochemistry, and spectroscopic techniques showed that the solubility of CO$_2$ in the 15-20% acetonitrile mixtures was only about 10% lower than that seen in the pure bmim-PF$_6$.

**CHARACTERIZING RESIDUES CAUSING MISFOLDING AND AGGREGATION PROPERTIES OF SUP35 YEAST PRION PROTEIN**

*Molly S. Strayer* (Dr. Kathryn M. Matera) Department of Chemistry

Prion diseases (mad cow and Creutzfeldt-Jakob diseases, for example) are caused by infectious corruption of the prion protein, a protein in the brain. Prion diseases are unprecedented in that they spread infection directly from protein to protein, a capability that has until now been attributed only to DNA. This study explores the unique mode of aggregation of a yeast prion, Sup35, specifically the interactions between the amino acids causative to this behavior, and the functions that can then be extrapolated in consideration of the human disease. The original goal of the research is to determine the key chemical interactions involved in PrP conformation change upon prion-infection. Although the some important regions of Sup35 have been functionally characterized by previous research, the complete understanding of chemical interactions is lacking. This project is intended to examine these and other identified regions important to prion function in depth, so that key amino acids and the chemical interactions in which they are participating can be. Congo Red aggregation assays were run on truncated Sup35 protein to measure aggregation time of the wild type protein, synthesized from a plasmid construct in a bacterial (*Escherichia coli*) system. Future work in this project will compare that aggregation of mutated proteins as measured by the Congo Red assay, to detect important residues.

**PROJECT BASED LABORATORY DEVELOPMENT**

*Victoria L. Van Vliet and Geoffrey F. Hall* (Dr. Daniel W. Wright) Department of Chemistry

Early literature employs a traditional approach when delivering laboratory instruction. Current laboratory development has progressed from traditional “cook-book” experiments toward innovating project-based experiments incorporating a creative balance between fundamental chemical skills and collaborative work. Developed project themes include: wine chemistry, forensic chemistry, environmental chemistry, and food chemistry. Current work expands upon the existing themes of wine chemistry and forensic chemistry, while introducing a new theme, chemistry of art.
The wine chemistry project involves the analysis of acid, alcohol and antioxidant content in a variety of wines. Previous work on acid analysis employed basic titrations, an essential 1st year lab technique. Analysis of alcohol and antioxidants are performed through spectrophotometric methods. Current work is progressing on a new protocol to determine alcohol content through a standard addition method. Some success has been seen in certain wine varieties but a universal method is still elusive. Preliminary results on current efforts in the analysis of alcohol and antioxidants will be discussed.

New developmental efforts are focusing on the chemistry of art with the exploration of two possible experiments. The first originated from a Mythbuster’s episode in involving inquiry into black and white film development using orange juice. Can one actually use orange to develop film? What other household chemicals could be used? Research investigated the myth and tested other chemicals including coffee and wine. Based on preliminary efforts a new experiment was developed where students investigate the developmental process. The second project arises from a natural property of specific metals (titanium, niobium) to anodize (change color) when exposed to electricity. Investigations are currently underway testing which solutions (as unique as Coca-Cola) work effectively, which metals show better results and how much time is needed to produce certain colors. While preliminary work shows promise, work is still be performed on creating an experimental protocol. Creation of the protocol will allow testing the research as an experiment with students.

As teaching methodologies evolve, so must our laboratory structure. The current projects incorporate exciting and innovative means to teach the fundamental laboratory techniques for first year chemistry students.

COMMUNICATIONS/JOURNALISM

CHIRPING FOR CHARITY: HOW US NONPROFIT ORGANIZATIONS ARE USING TWITTER TO FOSTER DIALOGIC COMMUNICAION

Carolyn T. Baumgarten (Dr. Vic Costello) School of Communications

In the past five years, social media has evolved into a popular way of staying connected, voicing opinions, and reaching out to others. Now that organizations and corporations are using social media it’s interesting to look at how is it being used, and with what effect. The theory of dialogic communication was pioneered by Plato, and refined in recent years by public relations practitioners who view it as a useful tool organizations can employ when making connections with target audiences. According to Kent and Taylor (1998), dialogic communication is “any negotiated exchange of ideas and opinions.” What makes dialogic communication different from other methods of communication is the notion of “negotiated exchange”. Rather than a broadcast message that travels one-way with little opportunity for feedback, social media opens up two-way channels of communication that make it easy for the audience to respond to messages they receive.

One social media outlet with tools and capabilities specifically geared toward dialogic communication is Twitter. This research explores how nonprofit organizations are using Twitter to foster two-way communication with their audiences. The Twitter feeds from a representative sample of nonprofit organizations were analyzed over a 3-week period. The organizations included in this study were chosen from the 2010 Forbes list of the top 200 charities. Tweets were coded for their adherence to four principles of dialogic communications: 1) conservation of visitors, 2) generation of return visits, 3) providing useful information to a variety of publics, and 4) maintaining a dialogic loop (Kent & Taylor, 1998). Using data from this analysis, the organizations were separated into dialogic or non-dialogic subgroups for comparison.

This research seeks to answer two questions: 1) What practices are used by nonprofit organizations to foster dialogic communication with their audiences? 2) How do the tweeting strategies of nonprofit organizations that employ dialogic tactics differ from those using non-dialogic approaches? The answers to these questions are important in guiding the future efforts of nonprofit organizations as they draw fundamental connections between themselves and their audience, in hopes of motivating interest in their cause.
MEETING A GLOBAL AGENDA: IDENTIFYING CORE VALUES ON THE INTERNET

Kirsten E. Bennett, Andrew J. Smith and Samantha L. Baranowski (Dr. Glenn W. Scott) School of Communications

An attempt to identify the international core values of the Internet was one of the most compelling issues for the 2,000 stakeholders who attended the United Nations-sponsored Internet Governance Forum in September 2010 in Lithuania. Identifying core values may sound simple, but speakers at the IGF sessions found that arriving at an international consensus is no easy task. The IGF is an organization intended to foster a global conversation for the mutual benefit of various stakeholders. Participants in one unit, known as a ‘dynamic coalition,’ agreed to continue work over the next 12 months on exploring methods to identify such core values. Why is the quest for core values difficult? One reason is that values -- such as openness -- dear to certain cultures and nations, are not necessarily prized by other people, corporations, and governments. Why is it important? Not everyone agrees that values can be identified at all, but simply having conversation about potential values allows for discussion to be created on the varying needs of different countries. A leader of the dynamic coalition, Alejandro Pisanty described it best: "We do not take these values from writing on walls or stones or read them in the clouds of tea leaves. We discuss them and we build them as we apply them and interpret them.” Suggested values proposed through a study such as this serve as a pre-assessment of the coming impact of new technologies and needs of groups to deliver better policy choices and social planning. Three undergraduates built on their more than 60 documentary interviews at the IGF conference and their participation in the dynamic coalition’s discussion by developing a working document identifying 70 international core values of the Internet. Such an outline would have immediate utility on a global level as a working document that other stakeholders might reference in continuing IGF discussions over the next several years. Indeed, members of the dynamic coalition in Lithuania lamented the lack of a working document. From this, the students drew motivation to draw on their research to prepare such an intellectual outline. The students conducted two rounds of qualitative coding of the data to identify and reduce themes to achieve a document that explains the IGF process and argues for points to be considered as core values. The main values to be discussed in this project fall under the general topic headings of: Access, Connectivity, Developmental, Fairness, Security and Functional. The coded values fall beneath these headings for specific reasons, and will continue to develop as the coalition continues its’ discussion.

THE ETHICS OF PERSUASION IN CHRISTIANITY IN THE 21ST CENTURY

Paul B Billings, III (Professor Melody van Lidth de Jeude) School of Communications

In his Rhetoric, Aristotle describes effective speaking as, "the ability, in each particular case, to see the available means of persuasion." However, this strategy of using any means is not well thought of in our culture. It suggests duplicity and a self-serving spin on truth. We criticize the empty rhetoric of politicians and the false expectations raised by unethical advertisers. This issue becomes even more problematic when discussing issues of faith. Can a Christian use persuasion effectively and ethically? If so, how? Unlike politicians and advertisers, preachers have traditionally spoken to their faithful flock and built their sermons with a strong emphasis on shared ethical values, emotion, and faith. Using Aristotle’s famous modes of persuasion including ethos, logos and pathos, this research project targets the traditional tension between Christianity and persuasion in modern America. Using Aristotle to analyze a talk given on March 4, 2008 to students at the University of California-Berkley by bestselling author and Orthodox Traditional Preacher Timothy Keller from New York City’s Redeemer Presbyterian Church, gives insights into Keller’s strategies to build ethos or credibility outside of his flock. Aristotle’s modes also clearly delineate Keller’s idiosyncratic use of modern psychology (ethos) and historical details (logos) in place of more traditional appeals of pathos and faith. In the end, this study concludes that Keller's preaching style shows that persuasion carefully applied can be effective without being unethical. Furthermore, Aristotle’s modes provide a lens that can be used to determine effectiveness and ethics, not only for preachers, but communication students, consumers, or advertisers.
THE RELATIONSHIP OF PARTICIPATION IN ONLINE SPORTS SITES WITH SELF-IDENTITIES AS FANS AND COMMENTATORS

Evann P. Clingan (Dr. Glenn W. Scott) School of Communications

As traditional media gives way to digital media, particularly the Internet, consumers are beginning to live increasingly hybrid lives where the real world and the digital world interact. People’s views of the real world are shaped by their highly mediated lifestyles, so researchers must discover how consumer changes will result in societal changes. This research aimed to explore the process of how National Football League (NFL) fans who interact with and participate in sports-related news and information sites on the Internet negotiate their self-identities as fans and commentators. This research examined the interaction that 10 male participants have as fans and commentators with sports-related information. To determine whether a participant’s identity as a fan or commentator will or will not change over the course of the study, the researcher used a baseline questionnaire, a log to track interactivity, and a second questionnaire. While there was not a significant change in fanship or commentatorship overall, participants experienced a decrease in identity in some areas. It was also concluded that identity negotiation, in terms of online interaction, is not a linear process. This winding path is shaped by a user’s specific interactions with other users and with various website platforms.

COURAGE THROUGH FAITH: A LOOK AT RELIGION AND IMMIGRATION

Gabrielle L. Dean (Dr. Brooke Barnett) School of Communications

Immigration is a heated political issue, particularly in light of the recent divisive illegal immigration legislation passed in Arizona. But one part of the immigration issue that is not getting much attention is the role that religion plays in immigrants’ lives as well as in the current political debate. In the form of a short documentary film, this project explores emic views of how religion is a cause for and aid in navigating difficult political and social issues such as immigration. Using a case study of La Vela Mission—a predominantly immigrant Spanish language church in Greensboro, NC—and grounded theory, this film portrays an emic understanding of how religious beliefs influence political and social views, prompt people to social activism and provide courage to continue despite opposition. This study also finds that religious organizations can help to foster a sense of community among immigrants and play an important role in facilitating bridge building between the immigrant community and outside groups. The role of religious groups as an intermediary is highlighted in this film by the developing relationship between La Vela’s minister and the Guilford County Sheriff’s Department because immigrants, particularly those who are undocumented, have historically been very fearful of law enforcement. The Sheriff’s office is working to combat human trafficking, a problem tied inexorably to illegal immigration, and has found that they need build trust and cooperation with the Latino community in order to successfully counteract this issue. The collaboration between La Vela and the Sheriff’s department provides a unique lens through which to view a highly complex social and political issue and could present a working model for relieving some of the tension between law enforcement and immigrants in other parts of the country.

NETWORK TELEVISION BROADCASTING DURING UNITED STATES CRISSES: ITS EVOLUTION, EXECUTION, AND EFFECTS

Brittany L. Dewey (Dr. David A. Copeland) School of Communications

The gun points at the president and discharges a bullet. The plane nosedives straight into hundreds of offices. These were the beginnings of two distinctive catastrophic events in US history, both of which were captured by network news stations. The Kennedy assassination set the precedent for how network news makes production decisions during crises. Additionally, groundbreaking technological developments prepared the broadcast industry to cover the terror attacks on September 11, 2001. However, the protocol surrounding how and why these decisions are made is still unclear to the general public. The purpose of this research is to answer those questions. These are questions that affect every journalist and audience member because news stations are information disseminators. This research aims to increase the viewers’ understanding of crisis communication in the broadcast industry. Six qualitative interviews were conducted with news producers and reporters to explore crisis management with regard to production decisions at
televising broadcasting stations. These subjective narratives, in combination with a review of previous research, were used to analyze the overall patterns of decision-making at a television station during a catastrophic event. Analyzing techniques involved 1) the identification of production themes within each station and 2) the comparison of these themes to other interviewee accounts and current scholarly research. Snowball sampling was used to gather quantitative statistics regarding viewers’ opinions on a station’s coverage of an iconic event. The survey was issued through social media and email. In order to achieve a snowball sample, the survey was sent to specific viewers residing in different states. Recipients were instructed to send the survey to other groups residing in the state, including classmates, relatives, coworkers, et cetera. The sample measured 200-viewers across the country. Results determined the qualities valued when breaking news of a crisis. Results also found determining factors in viewers’ preference for a specific network during a time of crisis. Production decisions vary based on the network, yet the research discovered a common theme among all networks: production teams want to relay the latest information by showing audiences decent and relative stories. This research discovered multiple themes in order to attempt to explain the significance of the work conducted behind the camera.

A CHURCH UNDER FIRE: THE ROMAN CATHOLIC CHURCH IN AMERICA THROUGH ONLINE AND SOCIAL MEDIA

Stephen Michael Ferguson (Dr. Kenn Gaither), School of Communications

As a 2000-year-old institution with more than a billion followers worldwide, the Catholic Church is arguably the world’s largest organization. It spans myriad cultures, languages, races, political and social ideologies, and despite these differences provides a common ideological and spiritual thread among these “publics.” The Church has faced numerous challenges to both its identity and relevance in recent years, partially from inconsistent news media portrayals. To deflect the pervasive negativity surrounding Catholicism in American culture, the Church struggles to find and project its own voice amid the noise and clutter of a society already oversaturated and influenced by media messages. With such a widespread following, the Catholic Church is grappling with a way to communicate effectively with these groups, reminding them of its mission and maintaining unity among adherents across countries and cultures. Increasingly, the Church is turning to social media in an effort to adapt to a new era of instant global communication. Through the use of content and narrative analyses, this thesis focuses on two areas. First, this research analyzes how the Catholic Church represents itself through its official online communications. Using framing and agenda-setting theories, the study examines the official websites and official online documents of both the Vatican and U.S. Conference of Catholic Bishops. Online documents include official papal messages, proclamations, and press releases from the Catholic Church. The study also looks at the Catholic Church’s use of social media such as YouTube, Facebook, and Twitter, and its effectiveness in utilizing these social media. Second, this research seeks to analyze how traditional online news media outlets represent the Catholic Church. This study examines 285 media subsidies over a three-month period from three of the largest U.S. news organizations—USATODAY.com, NYTImes.com, and Washingtonpost.com. This study has identified several dominant discourses about Catholicism in American culture, indicating a clear disconnect between the Church and secular society and a call among parishioners and the media for increased Vatican transparency.

THE CONTENT AND EFFECTIVENESS OF SOCIAL MEDIA IN ELECTION CAMPAIGNS

Jennifer A. Henricks (Dr. Richard Landesberg) School of Communications

Despite the growing body of research that exists around social media websites, little is known about the value of social media as a political campaign tool. This research examined 12 of the 2010 U.S. Senate midterm election campaigns, looking at the social media sites used by each of the two major party candidates in each race. A content analysis of these sites revealed both the content and effectiveness attributes associated with the messages candidates posted via these social media sites. Preliminary content results suggest that the candidates most frequently used social media sites to communicate content related to events they were hosting, while content that focused on the issue positions of the candidates was communicated significantly less often.
COLD WAR CULTURAL INFLUENCES: A CONTENT ANALYSIS STUDY OF TIME ADVERTISEMENTS

Lauren D. Kolodrubetz (Dr. Harlen Makemson) School of Communications

For more than four decades the Cold War dominated global politics and the media. It not only dealt with political issues but also influenced art, society, culture, and advertising. Therefore, this study sought to answer the question, how were print advertisements connected to Cold War themes? Past studies on Cold War advertising have mainly focused on the Advertising Council and its government-supported campaigns. This study draws a connection between advertising and consumerism in the Cold War more generally.

The study utilized content analysis method on one specific news magazine, Time, because of its wide readership across the American population. The years of 1953 and 1984 were selected because of their perceived level of Cold War threat as measured by the Doomsday Clock. The Bulletin of Atomic Scientists used the Doomsday Clock since 1947 to illustrate the level of Cold War threat to Americans by the number of minutes on the clock before midnight. This study also used 1960 and 1988 as controls to see if the years that were considered years of high threat in the United States did indeed show greater mentions of the Cold War in their advertisements. The study then coded a random selection of magazines (one edition every six weeks during the specified years). The study then coded every fourth full or two-page consumer print advertisement in the given years into product categories and related to the Cold War.

The study found that the specific years of high threat (1953, 1984) did not show greater references to the Cold War then the years of low threat (1960, 1988). However, it found that as time progressed, the number of the explicit and implicit references to the Cold War decreased. There were fewer references in advertisements to the Soviet Union and Communism. The study also found that pro-Americanism in advertisements increased with time. The advertisements used the word “American” or the American flag more frequently over time. The study clearly showed a connection between advertising and the Cold War, but it also opened up many opportunities for further research.

DEATH-RELATED MEDIA’S IMPACT ON NEWS AND DONATION PREFERENCES

James Alex Moss (Dr. Barbara Miller) School of Communications

The terror management theory was created from the ideas of anthropologist Earnest Becker, who postulated that subtle reminders of death encourages humans to cling more strongly to their cultural worldviews and makes them more hostile towards those who threaten their worldviews. Over the last several decades, this theory has been supported in over 175 research experiments and has recently been explored in the context of media content. Experimental research suggests that when media make death-related thoughts accessible, the salience of one’s mortality is heightened, resulting in more favorable attitudes toward in-group consumption objects than out-group consumption objects. In other words, it seems death-related media content may result in a preference for domestic over foreign brands. Researchers found this preference for domestic over foreign brands was mediated by enhanced consumer patriotism, the aspect of cultural worldview that is accessed when participants are exposed to death-related media content.

My study expands on this topic by investigating the impact death-related media content may also have on news preferences (domestic versus foreign news) and giving preferences (domestic versus foreign aid) using an experimental research design. To avoid the artificiality of a hypothetical news story, the experiment will include two actual stories of approximately equal length – a death-related media story and a control story. The death-related news report will focus on a death-related incident within the United States, priming participants of both death and patriotism, while the second (control) condition will be unrelated and benign. Based on previous quantitative studies related to terror management theory and the influence of death-related media content on brand preferences, I hypothesize that participants exposed to the death-related newspaper article are likely to show a preference for domestic over international news and be more inclined to give to domestic over international causes and issues. The results of this study may have significant implications for journalists as well as nonprofits dealing with humanitarian issues. This study has been approved by IRB, and the analysis will be completed by March 15, 2011.
DANCE FOR THE CAMERA

Stephanie E. Olsen (Nicole Triche) School of Communications

The purpose of this project was to enhance my knowledge of videography by researching dance for the camera works and apply what I learned to the performing art of dance. As a dancer and performer, I knew how to understand piece and perform it the way a choreographer intends. This does not always translate well to the videographer. Many times the piece looks one way on stage, but looks completely different when videotaped. In too many cases, the meaning of a dance is lost through film because it is being presented through a different medium. The editor can show certain aspects of a dance by cutting to different shots instead of showing the entire piece. While nothing can replace a live performance, a videographer’s goal when filming dance is to try to capture each piece in a way that does not diminish the essence of the dance. Filming techniques should be different for each piece depends on style, rhythm, theme, etc. Every dance piece is different, so why should every piece be filmed the same way? Dance and film continue to grow together in the performing arts and cinema worlds, so this project was a way to bring this growing trend to light by building a bridge between Dance and Communications departments at Elon. Inspiration for this project came from the dance film, Amelia, by the Canadian contemporary ballet company, La La La Human Steps. It is a 138 minute long dance film that incorporates many different sections. This film brought Edouard Lock’s choreography to the audience in a way that it never could if it were presented on stage. Through the camera, the dance can almost be limitless. I fell in love with this award winning dance film and it inspired me to study this type of work. In order to learn how to film dance, I spent time researching and studying other dance films. By viewing the dance films through the eyes of a cinematographer rather than a performer, I was able to study the different techniques, camera angles, and editing techniques that were used. The results of this project are able to address all the issues that students would encounter when filming dance. This includes researching the piece, the techniques for filming and editing as well as dealing issues that may arise in the process. One dance piece was filmed three different ways; a wide shot, multi camera and edited version. This project was done in hopes to educate future students on this combination art form, yet it has also helped me grow as an artist. While I have been able to take what I have learned and use it in the professional world, I also hope that other students find this research beneficial.

RELATIONSHIP-BUILDING AND OTHER USES OF SOCIAL NETWORKING TOOLS BY NONPROFIT ORGANIZATIONS

Catherine E. Reynolds (Dr. Amanda H. Gallagher) School of Communications

Social networking is now the most popular activity on the web (Qualman, 2009). Facebook alone now has member numbers in excess of 500 million, which is a major opportunity for corporations and nonprofit organizations to gain access to massive audience numbers with a medium that is essentially free and user-friendly. Because this field is constantly changing and growing, research regarding the uses of social networking tools by nonprofit organizations is relatively limited. This presentation and research focuses on how nonprofit organizations are currently using social networking tools, with a particular interest in how they use social networking as a relationship-building tool to create and maintain relationships and communication with volunteers, donors and other interested parties. The research was conducted at Elon University, and involves a multiple case study of four nonprofit organizations: Christel House International, Autism Speaks, UNC Health Care and OE Enterprises. Through interviews with public relation professionals from each organization and qualitative content analyses of their individual Facebook, Twitter and blog pages, we were able to draw out conclusions and findings, as well as identifying areas for future research. The method used was based on hybrids of other related studies in the field. Traditional communications theory was applied to the findings. We found that while the organizations all intended to use social networking tools to build relationships with their publics, they experienced varying degrees of success due to their resources, their knowledge and uses of the social networking tools, and the types of audiences they each have.
FREE MARKETING STRATEGIES FOR SOCALLY RESPONSIBLE STARTUPS: A CASE ANALYSIS OF FOUR EFFECTIVE ORGANIZATIONS

Laura M Schutter (Dr. Lackaff) School of Communications

Social media affords companies new opportunities to connect with stakeholders, and socially responsible organizations are especially likely to benefit from more immediate, engaging and transparent corporate communications. This study combines data from personal interviews of founders of socially responsible organizations and detailed analyses of social media output to present four case studies of social media marketing strategies. Given the limited marketing and communications budgets of many early startups, these companies were seen to embrace the online environment through interactive websites and active profiles on social media platforms like Twitter and Facebook. The research found that unlike traditional corporate launches and marketing campaigns, these companies have focused on building relationships, rather than simply transmitting information into the marketplace. These companies cultivate informational spaces that can be shared with a community of customers and other stakeholders, rather than devoting resources to specific "selling" ploys. This study presents a basic overview of how socially responsible startup companies are making use of new interactive communication platforms, and explores the particular potentials of social media for this specific communications context.

COMPUTING SCIENCE

CREATING A VIRTUAL WORLD AND NAVIGATING THROUGH IT USING GESTURE RECOGNITION

Daniel R. Cresse (Dr. Shannon Duvall) Department of Computing Sciences

The research addresses the issues and complexities surrounding the recognition of gestures and the application of said gestures into a virtual environment. Virtual environments are collections of images that provide a sense of immersion complemented by sensory stimuli. Gesture recognition is the process of interpreting a series of points on a screen as a meaningful gesture such as a letter, symbol, or direction. It uses mathematical algorithms and can focus on many different human gestures such as emotional gestures of the face, hand gestures, or body language. Gesture recognition is a difficult field because, unlike pressing a button, gestures are very difficult to define. There are patterns in gestures but each one is different, just as each person’s handwriting is unique. Gesture recognition is a relevant topic in the field of Computer Science as many major computer software and hardware companies have been taking steps towards motion controls and touch-screen based hardware and applications. The project aims to determine the difficulties that arise when interpreting a 2D (2-dimensional) gesture into a 3D (3-dimensional space) as well as the computational complexities that develop when moving into 3D space. We will present our algorithm for mouse based gestures implemented with the XNA development platform to create a 3-dimensional virtual world in which the 2D gestures of the computer mouse are meaningful in a 3D space. In our talk we will present our gesture recognition system and explain the process and methodology that went into developing it as well as the overall complexity that arises when interpreting 2D gestures in 3D space.

CATCHING FIREFLIES: A PERSUASIVE AUGMENTED REALITY GAME FOR ANDROID PHONES

Amy R. Eubanks (Professor Joel Hollingsworth) Department of Computer Science

Catching Fireflies, an augmented reality game for the Android Operating System, has many purposes such as to explore how best to simultaneously use multiple abilities of the phone as well as to offer players a nostalgic, calming experience. However, the overarching motivation for the firefly application is to address the question of how to use technology to compel users to step outdoors and recapture an appreciation for the simple beauty found in nature. In short, how effective is an augmented reality game in getting people to go outside?
The application includes two Android activities and a live-wallpaper that work seamlessly together: 1) a “field” program that maps and displays a number of virtual fireflies to an open space to allow the player to view them; 2) a “capture” program that relies on the proximity sensor to register a capture and consequently removes the firefly from the open space and places it into the lantern; and 3) a lantern live-wallpaper that animates the captured fireflies in a lantern, including the light generated by the fireflies [1].

With the novel use of augmented reality as a persuasive technology, the game “Catching Fireflies” animates glowing, moving fireflies created specifically for the game, over a streaming image generated from the phone’s camera. Multiple options for play allow the user to choose among timed, leisurely, or a more competitive version of the game. The game supports play at both night and day; however, it must be played outside. Besides the camera and GPS, the application uses sound, vibration, the proximity sensor, accelerometers, and orientation sensors to encourage players to relive their outdoor childhood memories of catching fireflies. The combination of using augmented reality as a persuasive technology along with incorporating free movement makes “Catching Fireflies” a unique mobile application. However, in order to completely answer the research question (how effective is the game in getting people outside), a social study which measures participants’ time spent outdoors before and after the game would need to be conducted.

AUTOMATED COLLECTION OF CODE-LEVEL METRICS FOR THE DEBIAN PACKAGE REPOSITORY

Carter D Kozak (Dr. Megan Squire) Department of Computing Sciences

In this presentation, I will describe open source software and its importance, as well as a new process to collect, calculate, and distribute interesting software engineering metrics for all the packages in the standard Debian GNU/Linux installation. Our method replicates and extends previous work done by other groups studying free and open source software systems (FLOSS) in three important ways. First, although there have been other previous studies that attempted to collect a large set of code-level metrics for a small set of projects, and there have been studies that generated a small set of metrics for the large Debian codebase, our project does both: we generate a larger set of metrics for the entire set of Debian packages. Second, our integration of new Debian metadata and additional code-level metrics not gathered before adds several additional layers for exploration. Finally, and most importantly, because we integrate our collection and analysis process into the automated FLOSSmole data store, we ensure timely, repeatable, and very easy replication and analysis by other groups. Thus our collection activity will continue in an automated fashion, and be freely accessible to any interested research group. After outlining our process, we discuss a few observations about the data and present some opportunity for further research.

EXPLORING DATA VISUALIZATION

Andrew Z. Sutherland (Dr. Shannon Duvall) Department of Computing Sciences

Recently huge amounts of data have become available for anyone to use and interpret. The question is how to manage, interpret, and gain knowledge from all this data. Observing raw data tells very little about trends or patterns, and almost nothing can be inferred without the use of intelligent, informing visualizations. I will be exploring a wide variety of these visualizations. My work will create a library of data visualizations that satisfy the following requirements: the library can be widely applied to the vast multitudes of free online data; someone with little or no programming experience can use the library to create intelligent, informing visualizations; and the code will show good coding and documentation conventions as well as ways to create new, unique visualizations. These requirements will ensure reusability and extensibility for future Data Visualization needs at Elon University and beyond. Throughout the process of creating this library, I will be exploring the factors that produce a good visualization by going through the process of creating them: finding data, choosing the best visualization for it, and tweaking the code to create the most informative visualization. I will be using a language called Processing. Processing is built on top of Java with an emphasis on graphics and animation. It greatly simplifies all the coding that needs to be done to produce good drawings, so that most of the work in creating visualizations is in finding good data and exploring what type of visualization best summarizes
In my talk I will demonstrate the new software system I created, discuss the successful use of it in a current Elon class, and give ideas for future work in this exciting area.

**CO-LOCATED COLLABORATIVE SENSEMAKING ON A LARGE HIGH-RESOLUTION DISPLAY WITH MULTIPLE INPUT DEVICES**

Katherine A. Vogt, Lauren Bradel, Christopher Andrews, Dr. Chris North, & Alex Endert
(Dr. Duke Hutchings), Department of Computing Sciences

Intelligence analysts must make sense of large amounts of disparate information in order to evaluate and predict various situations, such as a threat to national security. As they work through the sensemaking process, the field of visual analytics seeks to productively help the analysts comprehend large amounts of textual data with concise visualizations. Analysts often work collaboratively in a co-located setting, but prior to this study, there was no work exploring the collaborative analytic process on a large, high-resolution computer display. Here, we have the explored the concept of large-display collaborative visual analytics by running an intelligence analysis exercise containing a terrorist plot with pairs of people who had experience working together. Each member of the team had their own keyboard and mouse inputs which facilitated the co-located collaborative sensemaking process on the display. Eight pairs of participants served in the study, during which we collected video and audio recordings, display screenshots, and participant mouse actions and user interface window movements. We also conducted interviews and completed post-hoc video coding to aid the analysis. Evident in the analysis were five unique strategies which together formed the computer-aided collaborative sensemaking process. We also identified spatial and territorial patterns adopted by the participants on the large display and user roles that developed within the teams. Teams which collaborated most frequently also produced the highest scores for the exercise. Combining all of these findings, we have developed design implications for co-located collaborative computer hardware and software tools.

**ECONOMICS**

**HOMOSEXUAL WAGE DISCRIMINATION IN THE 21ST CENTURY**

Micah Peter Boomer (Dr. Katy Rouse) Department of Economics

Since 1990, approval for equal rights in terms of job opportunities for homosexuals has gone up by 17 percentage points to 89 percent of Americans, while disapproval has gone down 10 percentage points to 8 percent (Gallop, 2010). With increasing acceptance of homosexuals, one may assume that wage discrimination against homosexuals has also diminished. However, the increasingly hostile political debate over homosexual rights, as made evident by the tabling and eventual death of the Employment Non-Discrimination Act (EDNA) in Congress in 2010, gives ample need to test whether there is homosexual wage discrimination in the United States using current datasets. Previous studies have found that there is a significant wage gap between heterosexuals and their homosexual counterparts (Badgett, 1995; Klawitter and Flatt, 1998; Allegretto and Arthur, 2001; Black et al., 2003), though these studies are hindered by their use of datasets from 1990 and earlier, before the dramatic shift in the American society’s view towards homosexuals. This study uses recent data from the September 2010 Current Population Survey (CPS) to determine whether the wage discrimination against homosexuals as found in earlier studies still persists today. Since respondents are not asked outright whether or not they are a homosexual, homosexuals are defined using two separate coupling specifications. In the first definition, cohabitants of the same sex are considered homosexuals. In the second definition, respondents with unmarried partners of the same sex are considered homosexuals. The effect of children on wage discrimination is also tested. Using a Mincerian wage regression model and the Oaxaca-Blinder Decomposition, which isolate homosexuality as the only means for differences in wages, this study finds that there is no significant difference in wages between homosexuals and their unmarried heterosexual counterparts. However, the evidence suggests that there is still a marriage premium for heterosexual men, where married men earn significantly higher wages than all other demographic groups simply because they are married. Discrimination then may still be present today if coupled homosexual men are not significantly different from their married heterosexual counterparts.
A RE-EXAMINATION OF THE ENVIRONMENTAL KUZNETS CURVE: A CROSS-COUNTRY ANALYSIS OF THE IMPACT OF TRADE AND ECONOMIC GROWTH ON WATER POLLUTION

Stephanie A Franz (Dr. Stephen DeLoach), Department of Economics

The main question this paper seeks to answer is: how does trade liberalization affect water pollution? To answer this question, this paper analyzes the impact of openness to international trade on a country’s water pollution concentrations, using data on biological oxygen demand (BOD), dissolved oxygen (DO), fecal coliform, and phosphorous levels. The fixed effects model, based on the one developed by Antweiler, et al. (2001), separates trade’s effect on water pollution into the scale, composition, and technique effects. Specifically, this paper will focus on whether changes in pollution are most sensitive to a country’s capital-labor endowments or its environmental regulation. Traditionally, a country’s capital-to-labor ratio (composition effect) is positively related to pollution levels, and its GDP per capita (technique effect) is negatively correlated with pollution levels. Because these two effects operate in opposite ways, understanding the distinction is essential to determining the actual impact of trade liberalization on water pollution. An additional goal of this paper is to establish whether the technique effect functions most effectively in a “free” country, as suggested by Barrett and Graddy (2000). The results obtained from this study are largely consistent with previous research for some measures of water pollution (BOD, DO); increasing the scale of economic activity will increase pollution, but an increase in the incomes of the country’s population will cause a decrease in pollution levels. Contrary to previous findings, increasing a country’s industrial production (relative to agricultural production) does not necessitate an increase in pollution. These results challenge the notion that capital-intensive goods are always bad for the environment, and they raise questions about how applicable the theory is to measures of water pollution.

IMPACTS OF EDUCATIONAL ATTAINMENT RISK FACTORS ON WAGES

Andrew Michael Garrison (Dr. Mark Kurt) Department of Economics

There is a clear connection between educational risk factors: delayed enrollment, part-time attendance, financial independence, undergraduates with dependents, students working full time while enrolled, and students who did not graduate from high school with post secondary educational attainment (Tinto 1975). It is believed that these risk factors negatively impact the human capital accumulation process. Therefore, risk factors make it more difficult for an individual to complete a given level of education. In this paper we seek to establish the link not simply between risk factors and education level but the level of human capital itself. This study links these risk factors with detailed data regarding an individual’s college experience, labor market outcomes, linked with human capital theory. If less human capital is accumulated over the college experience conditional on receiving a degree when one has some risk factors, then wages will be lower and unemployment will be more likely. In order to accomplish these goals our model controls for known determinants of wages as well as the data on attainment risk factors along with detailed data on observable human capital. All of these data are present in the B&B 1992-03 study.

THE INTERTEMPORAL CHOICE OF SUBPRIME BORROWING

Ian J. Grady (Dr. Gregory Lilly) Department of Economics

This paper extends the research on intertemporal choice by asking how attributes other than interest rates influence multi-period borrowing for homes. Both normative and behavioral models of intertemporal choice assume that consumer choices are driven by interest rates and total income. However, thousands of Americans acquired ‘subprime’ loans despite the reduced future income and higher interest rates. I hypothesize that consumers often choose between mortgages in a way that is inconsistent with both the normative economic and behavioral models. By using an experimental economic design, this study examines how MBA students choose between loan payment schedules to determine whether students are attending to interest rates or to other attributes when choosing between housing loans. Results of the studies indicate that people do attend to attributes other than those predicted by normative models; more specifically, consumers choose between loans based on attributes other than interest rates.
STATE LAWS AND FORECLOSURE RATES A BRIEF ANALYSIS

Kevin J. Sheridan (Dr. Tiemann) Department of Economics

In response to the recent financial crisis, different mortgage laws have been proposed to attempt to reduce foreclosure rates. In economic literature, foreclosures are seen as the result of either income or wealth based shocks. Mortgage laws were divided into laws that attempted to reduce income shocks, and those that attempted to reduce wealth shocks. A study was initiated to attempt to determine the effectiveness of each set of laws in reducing foreclosures.

A difference on difference study was conducted via sampling all counties within the Metropolitan or Micropolitan Statistical Areas in the United States during both 2006 and 2010. State-level differences in laws allowed the effects of different laws, for this reason four states were not included due to changes in the mortgage laws in the period of concern or difficulty in obtaining consistent numbers.

Results were largely as expect, with both income-shock and wealth-shock laws reducing the mortgage rate in a crisis. Longer foreclosure times were shown to reduce the foreclosure rate, as were prepayment penalties. The study offered one notable anomaly, preventing Negative Amortization significantly increased the Foreclosure rate both in and out of a crisis. Follow-up research will be conducted to explore this anomaly.

“VIRTUAL WATER” AND ITS EFFECTS ON GDP GROWTH

Charles P. Smith (Professor Yoo) Department of Economics

Without access to consistent and improved water resources, economies cannot function; lives are lost to disease and hunger; children cannot attend school; women cannot adequately care for their families. The global water scarcity crisis sits at the epicenter of economic growth in the coming century, posing a serious threat to the global economy. The concept of “virtual water” has created a new line of economic thinking, taking a new angle on economic growth and international trade. Virtual water is simply the water needed to make or grow a commodity, not the water physically contained in the commodity. In the context of international trade, virtual water refers to the long-distance transfers of water in virtual form from country to country and it is becoming increasingly useful in evaluating economies and trading patterns which can shed a new light on issues of water scarcity in a nation or region. This research seeks to find if countries are utilizing their natural freshwater resources to their economic advantage through the prism of virtual water. Regression analysis is used to explore this relationship with GDP as the independent variable and net imports of “virtual water”, water scarcity, and other control variables as the dependent variables for over 160 countries. The basic hypothesis of this study is countries that are exporting more virtual water will have higher Gross Domestic Product.

The understanding of how water affects economies could have large ramifications, especially for water scarce countries that may need to reorient their economies in the face of the global water scarcity crisis. This study seeks to help uncover this relationship and utilize its findings to better understand the global economy. While this study is in the final stages of completion, initial results show a relationship between virtual water flows and economic growth. It is my hope that significant results stem from this regression model and can be applied to the greater economy. Water will be a key factor of production in the coming decades, and to better understand water will likely mean a better insight into the driving factors of economy growth.

EARTHQUAKES AND THEIR EFFECTS ON INFANT MORTALITY RATE IN INDONESIA

Allison M. Stolte (Dr. Steven Bednar) Department of Economics

In recent years, natural disasters have become more prevalent in the global community making the understanding of their economic effects increasingly important. While some economists argue that natural disasters spur economic growth, others argue that the destruction of both human and physical capital hinders growth in the long run. This research will test the effects of natural
disasters on economic conditions by studying the effects of earthquakes on infant mortality rates throughout Indonesia, using infant mortality as an economic indicator. Indonesia is an island nation located in the Ring of Fire subject to many earthquakes each year. Scientists cannot predict the exact timing, location, or strength of earthquakes and economic conditions cannot cause earthquakes, making the disaster a perfect exogenous shock. Further, these earthquakes do not hit every province in Indonesia, allowing for those provinces that have not experienced earthquakes to work as controls. The data regarding significant earthquakes was collected from the United States Geological Survey from 1990-2010 and the variables pertaining to infant mortality rate and controls were collected from the Indonesian Family Life Surveys (IFLS) in 1993/1994, 1997/1998, 2000 and 2007/2008. The question at hand is investigated by combining the earthquake data for each province and each person’s individual data obtained from the IFLS into an econometric model. There is substantial variation in both infant mortality rates and the number and severity of earthquakes across provinces, which will be exploited to identify the role disasters play in determining economic conditions. The remainder of the study will focus on the direct effect of the earthquakes on each provinces’ infant mortality rate, predicting a newborns chance of surviving the first year of life by the number and severity of earthquakes experienced in his/her area. Further, we will use the remainder of the time to study econometric problems, as well as study additional factors, such as number of hospitals, government aid, etc., that are affected by the earthquakes which an area experiences and affects the infant mortality in that area.

THE INFLUENCE OF SCHOOL ON CHILDHOOD WEIGHT GAIN

Kaylyn E. Swankoski (Dr. Katy Rouse) Department of Economics

The prevalence of overweight among U.S. children has more than tripled over the past three decades, with almost 17 percent classified as obese today. The dramatic increase in weight problems among children has been described as an epidemic, with public officials at a loss to explain this rapid rise in overweight among American children. At the physiological level, the cause of overweight among children is simple; weight gain results from consuming more energy than one expends. In order to effectively address this policy concern, however, it is critical to examine the determinants of a child’s caloric intake and expenditure. Children split their time between school and home environments. Schools are often criticized for contributing to the growing obesity epidemic through their offerings of unhealthy school lunches and fewer physical education classes. Yet, there is currently little research literature on the relative impacts of school and home environments on a child’s weight. This paper seeks to fill this gap using fixed effects economic modeling and data from the Early Childhood Longitudinal Study-1998 Kindergarten Cohort, which measures children’s BMI growth over two consecutive years. The specific goal of the paper is to determine whether school negatively affects childhood weight gain or, if instead, the structure of the school day inhibits unhealthy weight gain. Results show that BMI growth accelerates during summer vacation. Estimates imply that, on average, a child’s BMI grows at a per monthly rate 3.07 times faster during the summer than during kindergarten and 1.87 times faster than during first grade. This relationship implies that schools provide healthier environments for BMI growth. The findings of this paper are pertinent to today’s policy makers. The current administration is working towards improving the school environment with the hopes of curbing childhood obesity. While it is important to have a healthy school environment, the results of this paper suggest that the home environment may be more detrimental to childhood obesity. Thus, policy makers may also want to focus attention on improving a child’s home environment.
EDUCATION

A CASE STUDY COMPARISON OF DUAL LANGUAGE PROGRAMS AND ENGLISH AS A SECOND LANGUAGE PULL-OUT PROGRAMS: DIFFERENTIAL OUTCOMES ON STUDENT LEARNING

Lindsay R Mann (Dr. Carolyn Stuart) Department of Education

The purpose of this investigation is to compare the effects of two English language learning programs—English as a Second Language (ESL) pull-out programs and Dual Language (DL) programs—on the social and academic learning outcomes of public school students. In ESL, English language learners (ELLs) remain in the general education classroom for the majority of the day and are “pulled out” for approximately 45 minutes daily for English instruction. By contrast, students in Spanish DL programs spend half the day learning in Spanish and half the day learning in English. The class is composed of half native English speakers and half native Spanish speakers.

The central question of my research is the following: What are the social and academic learning outcomes for students in ESL pull-out and Dual Language programs? A review of literature in the field indicates that DL programs are more beneficial for students’ academic gain (DeJesus, 2008 and Thomas and Collier, 2004). The purpose of my case study is to both determine whether this finding is corroborated through my research and, more importantly, to gain a deeper understanding of why DL programs appear to be more beneficial for ELLs and native English-speakers.

A qualitative case study methodology was used. Two public schools were selected, one with an ESL-pullout program and one with a 50:50 Spanish/English DL program. From each school two kindergartners, one native English-speaking and one native Spanish-speaking, were selected. Data were collected through field observations, parent and teacher interviews, and analysis of student work samples. Field observations were conducted in students’ natural settings—the classroom, playground, and cafeteria. The teachers and mothers of student participants were interviewed. Interviews were recorded and transcribed. The constant comparison method of data analysis was employed. While data analysis is still continuing, emerging trends support DL due to the perspective on cultural diversity, formation of cross-cultural friendships, quality of family involvement and academic rigor of instruction. Multiple cultures are directly infused into the curriculum, thus celebrating cultural diversity, promoting cross-cultural friendships, and inviting greater family involvement. The use of ELL instructional strategies results in more academically challenging learning experiences.

WHY ISN’T SCIENCE BEING TAUGHT? INVESTIGATING CONSTRAINTS ON ELEMENTARY TEACHERS

Lauren I. Rodriguez-McCleary (Dr. Mark Enfield) Department of Education

Science in the elementary school provides students with an opportunity to think creatively and abstractly. Through science, children learn various scientific concepts; they are introduced to lifelong skills like being competitive and meticulous; and they learn about current global issues. Unfortunately, there has been a great lack of science instruction in elementary schools. A nationwide survey of the amount of instructional time allocated for each subject showed that with increases in instructional time of math and reading, came a decrease in instructional time of other areas, including science. On average, science instruction has decreased to fifteen minutes each day (McMurrer, 2008). When many people hear about the dilemma of the lack of science, their immediate reaction is to blame it on the demands of No Child Left Behind (NCLB). While the Act is a contributing factor, it is reasonable to wonder if it is the only reason why science instruction is so seldom seen in the classroom. The purpose of this study was to investigate what factors affect how local teachers feel about their science teaching and how these factors interact with each other. Representative data was gathered through a validated survey that was administered to all teachers at the highest-, average-, and lowest-scoring schools in the Alamance-Burlington District. Three teachers were chosen for further investigation. They were interviewed and observed teaching. Data analysis was completed using an emerging themes approach and interrater reliability. Tentative conclusions suggest that there are many factors, other than NCLB, contributing to the lack of science in elementary classrooms.
These factors include funding; enthusiasm for science; instructional and planning time; resentment of science; and compliance with school-, district-, state-, and nation-mandated-programs. Through this research, I hope to add to the current knowledge of constraints on elementary science teaching and help teachers re-evaluate their attitudes regarding the subject. Many studies have been performed on this lack of science; most of them focus solely on the effects of NCLB. My study adds to a smaller number of studies, which investigates other factors that contribute to the lack of science and how they interact and affect each other.

**REPORTED EXPERIENCES OF ELEMENTARY GENERAL EDUCATORS WORKING WITH ENGLISH LANGUAGE LEARNERS**

Christine R. Zimmerman (Dr. Mary Knight-Mckenna) Department of Education

Although English language learner (ELL) students constitute such a large percentage of the American public school population, they are continually falling behind in standardized tests. With such a significant ELL population in our school systems today, it is clear that attending to these students’ needs is imperative to our nation’s educational success. Despite the abundant programs, strategies, and current research about ELLs (Peregoy & Boyle, 2005; Brown, 2000; Freeman & Freeman, 1998), there is still a gap between the field’s knowledge and the pragmatic implementation of these reform efforts. There are two questions posed for this grounded theory qualitative research study. The first is: “What are the reported experiences of ten elementary general educators working with ELL students?” Individual interviews were conducted with ten elementary teachers in order to collect this data. Data analysis indicated that these teachers’ shared four common experiences: passion for including ELL students in their classrooms, personal and professional growth, intentionality for meeting individual students’ needs, and an overall positive experience. Departing from grounded theory, a second layer of data analysis was conducted to answer the question: “How do teachers’ reported experiences of working with ELLs compare with Second Language Acquisition (SLA) theory?” The analysis compared teachers’ reported experiences to three frameworks within Second SLA theory: linguistics, psycholinguistics, and sociolinguistics. The data suggested that although these teachers did not refer to specific aspects of SLA, they instinctively incorporated aspects of it into their pedagogy of ELL students. The results of this study imply that while teachers are currently experiencing positive and effective work with ELL students, teachers may be affirmed, encouraged, and more knowledgeable in their work by learning about current SLA theory.

**ENGLISH**

**NARRATIVE MEDICINE: THE EXPRESSION OF HEALING AN EXAMINATION OF CONTEMPORARY MEDICAL LITERATURE WRITTEN BY PHYSICIANS**

Caitlyn E. Byrne (Dr. Cassandra Kircher) Department of English

Until recently there was an incommunicable barrier between the fields of Literature and Health Sciences, a barrier that Narrative Medicine has finally broken through. Begun in the past two decades by scholars such as Rita Charon at Columbia University, Narrative Medicine is a field that strengthens the practice of physicians, nurses, social workers and other caregivers by exposing them to works of literature that will aid them in identifying and connecting with patients’ accounts of suffering and illness. Although Charon discusses works (primarily fiction) written by famous writers, such as Henry James and Leo Tolstoy, she fails to include any non-fictional accounts written by practicing physicians, which leads to the essential question addressed by my research: What role can works of creative nonfiction written by physicians play in the field of Narrative Medicine? This question is imperative because the voices of physicians need to be heard; physicians are key authorities in the field of medicine, and they can provide sharp insight and unique perspectives into the American health care system and how it can be improved. In my research I will examine contemporary literature written by physicians, using Rita Charon’s *Narrative Medicine: Honoring the Stories of Illness*, as a framework to examine the ways in which the physician-authors, Pauline Chen, Atul Gawande, and other established physicians portray their experiences as surgeons and their views of the medical field. The conclusions that I have drawn from my research are that contemporary literature written by physicians is important to the field of Narrative Medicine. The field of
Narrative Medicine gains added strength and authority when it includes the voices of physicians, their stories, testimonials, even confessions, giving recognition to those doctors who have made strides to bring humanity back into their healing.

RETURNING TO MY ITALIAN ROOTS: FOOD AND TRAVEL WRITING AS CULTURAL RESEARCH

Morgan C. Ferretti (Professor Michael Strickland) Department of English

This past fall I had the opportunity to Study Abroad in Florence, Italy, source of my family’s heritage. While there I created a travel writing blog that allowed me to use writing as a main mode of inquiry for exploring the differences between American and Italian food culture. Through that experience I was able to explore the diversity between how the two cultures view the globalization of food production and how it has personally impacted me.

Creating the blog and being immersed in Italian culture allowed me to begin the preliminary research. After returning to campus I was able to do more in-depth research in cultural, scientific, and medical journals. I explore previous research that had been done on Italy’s historical and current push for a less globalized food market, and why local food is more beneficial globally and even medically. Research shows that Italy supports a much more localized food system by buying from local farmers, not outsourcing native products, and encouraging many businesses to become supporters of the Slow Food Movement. I then narrowed my research even further and examined olive oil production in Italy, compared to the United States, as an exemplary tool for exploring the different impacts of globalization.

The experiences that I had in Italy with food and culture, along with further research, allowed me to write up my findings about how the globalization of food has proved to be the main cultural difference in my experience between Italy and the United States. The difference has made me acutely aware of what I eat and where I purchase it. I posted my findings on my public travel blog as well, to inform the previous readers of my blog of this difference, and to show the benefits of a less globalized food system.

SO MUCH TO WRITE, SO LITTLE TIME: MEASURING THE SUCCESSES AND CHALLENGES OF COMMUNITY CREATIVE WRITING

Alexandra G. Hanner (Professor Paula Patch) Department of English

Community arts volunteers often hope to inspire and instill interest, self-confidence, and academic engagement in students in as few as 40 minutes a week. It is clear that this expectation is idealistic, but could it also be realistic? What, exactly, can be achieved in a single 40-minute out-of-classroom workshop, such as a creative writing workshop? How might one brief encounter help children learn about, gain confidence in, and even develop enthusiasm for writing? For this study, I created curricula for two creative writing workshops within two independently established programs, one at Girls Rock! NC, a weeklong creative expression summer camp, and the other at the Boys and Girls Club of Burlington, NC, an after-school program that aspires to enable young students to reach their fullest potential. To assess the effectiveness of the curriculum, I surveyed the participants of both workshops before and after the workshop, analyzed student work produced during the workshop, interviewed students and workshop staff, and observed the workshop environment. The results of the study illustrate that a student’s self-confidence will likely remain static or decrease as a result of one 40-minute writing session due to the sudden self-awareness that comes along with learning something unfamiliar in a new environment. Furthermore, it can be concluded that a brief, single visit into the creative writing community is most engaging if it includes both open-ended and prompted exercises and if it allows for a combination of fantastical and realistic writing.
THE EFFECTS OF DOMESTICITY AND HETEROSEXUAL RELATIONSHIPS ON THE PORTRAYAL OF GENDER IN BUFFY THE VAMPIRE SLAYER AND SUPERNATURAL

Margaret L. Hemmingson (Dr. Michelle Trim) Department of English

Popular culture texts like television shows often hold up a mirror to our own society, showing us our strengths and weaknesses and pointing out what qualities must be most valued while disguising its messages as entertainment. While much research has already been done regarding the portrayal of gender in Buffy the Vampire Slayer (1997-2003), very little has been done with one of its spiritual successors, Supernatural (2005-present), nor has anyone yet explored the possible ideological connection between the two series’ treatment of femininity and masculinity, respectively. Using the lens of contemporary gender theory to closely observe individual episodes of both series, the portrayal of gender in these youth-oriented television series is analyzed, specifically in regards to the way domesticity and heterosexual relationships are handled. Buffy does its best to shirk some traditional gender stereotypes in regards to women’s roles in the home, their families, and their romantic relationships, although it is not always successful in escaping certain troubling implications in some of its messages, particularly those concerning the sexual dynamic between men and women and the effect of female sexuality. Meanwhile, Supernatural, which, unlike Buffy, deals almost exclusively with the male perspective, is almost completely stereotypical in its portrayal of men’s roles in their families and romantic relationships; the series’ picture of masculinity is, in fact, so extreme that at times it verges on the edge of parody. While both series convey very different messages about gender, it is the similarity of the traits they value -- in particular, physical, mental, and emotional toughness -- that makes a comparative view of both television series so interesting and worthy of study. The mortal dangers of both fictional worlds make such toughness necessary, while these worlds’ resemblance to our own would suggest that both men and women in the real world must take on similar strength in order to survive, regardless of the emotional toll such an effort may take.

THE AIM OF THE TALE: EDGAR ALLAN POE AND THE PSYCHOLOGICAL GROTESQUE

Courtney N. McClelland (Dr. Prudence Layne) Department of English

This paper will show that Edgar Allan Poe used the grotesque to convey the inner abnormality of a character through an outward manifestation in his gothic short stories, reflecting his negative view of conventional reality. This paper attempts to destroy the stereotype that Poe is a disturbed man who writes terror tales with no purpose or merely to frighten his audience. Instead, it shows that he uses these works as satires to criticize the Romantic mind and its failure to accept a more objective truth and to see something greater beyond material existence. The protagonists with psychological shortcomings, which prevent them from seeing an objective truth, eventually destroy themselves, unlike the strong-minded detective characters who overcome perversities. By defining Poe’s use of the grotesque, examining grotesque manifestations, and viewing the demise of his characters (but success of his detective characters) as critiques and proof of the works as satires, I prove that the main aim of Poe’s tales is Truth (capital “T”). This Truth is not relative, as the stories’ protagonists unfortunately and dangerously believe, but objective and reach past mere human existence and experience. Poe warns us that reality is not always as it may seem and it is important not to get lost in our own minds and subjective experiences. Poe’s gothic short stories deserve a second look because they have a deeper meaning than what is commonly believed, and one that is actually surprising to many who view him as dark and perhaps immoral himself.
JOYCE’S RAZOR: A MISREADING OF THE DIVINE COMEDY IN ULYSSES

Jensen T. Suther (Dr. Kevin Boyle) Department of English

With my research, I have hoped to contribute to theoretical scholarship on modernist literature, as well as to the project of comparative literature to illuminate the “intertext,” in which texts across disciplines engage one another and reveal the tenacity of their boundaries. My methodology has consisted in close readings of Ulysses and The Divine Comedy, related critical material, and canonical theoretical texts, such as Harold Bloom’s The Anxiety of Influence.

James Joyce's Ulysses is often paired with Homer's Odyssey for obvious reasons: Joyce used the structure and central characters of the Odyssey to create a scaffolding that would allow his modernist epic to both engage with and disrupt one of the central texts of Western literature. To use literary critic Harold Bloom's terminology, Joyce was involved in an "agon," a struggle with his parental figure, Homer, and needed to wrest power away from him in order to create his own text. This same kind of struggle, however, also took place on a subtler, more important level: Joyce was involved in a literary rivalry with Dante, the Medieval poet who compiled a complex compendium of Catholic and philosophical erudition in his epic poem, The Divine Comedy. Whereas Dante reverently submitted to and glorified the Catholic vision of the world, Joyce, informed by the classics, refused to submit to any orthodoxy, becoming the ultimate artificer of a cosmos-his novel—in which all was equally consecrated—or unconsecrated. By creating his modernist prose epic, which challenges literary, psychological, theoretical, and religious orthodoxies, Joyce made an implicit challenge to Dante; instead of allowing other institutions or philosophies to constrain him, Joyce founded a religion of the avant-garde, which revolves around his text's organic unity and comprehensive, verisimilar portrayal of Dublin, a synecdoche of the world. This work has illustrated the centrality of Joyce’s reading of the Comedy to the construction of his own epic, while also demonstrating that his repudiation of orthodoxy has advanced literary and critical theory.

ENVIRONMENTAL STUDIES

CONTRASTING PLANT-WATER RELATIONS AND PERFORMANCE INDEXES IN TWO UNDERSTORY PLANT SPECIES IN A COASTAL MARITIME FOREST

Gabrielle A. Burn (Dr. Brant W. Touchette) Department of Environmental Studies

Ridge plains are coastal landforms composed of elevated ridges and low-lying swales positioned somewhat parallel to the shoreline. Transitions between ridges and swales are often steep, with dynamic shifts between wet and dry soil conditions. Two understory plants that co-occur in well-developed ridge plains in mid-Atlantic maritime forests are dwarf palmetto (Sabal minor) and yaupon (Ilex vomitoria). While both species inhabit freshwater wetlands, they are also fairly tolerant to dryer more upland ecosystems. Therefore, as coastal-ridge plains have varying amounts of surface and sub-surface water driven largely by topography, the purpose of this study was to evaluate how these plants respond to different water availabilities. In this study chlorophyll a fluorescence and plant-water relations were used to determine if any physiological differences occur between plants inhabiting ridges and swales of Buxton Woods (the largest maritime forest in North Carolina). Chlorophyll a fluorometry, which is a noninvasive procedure useful in determining plant stress, was used to develop an overall performance index that considers energy absorption and trapping, as well as the conversion of excitation energy in photosynthetic electron transport. Water potentials were also monitored in leaf tissues of both plants throughout the day to evaluate any water-stress conditions. The results show that plants occupying the ridge had different water relations, including lower leaf- and xylem- water potentials (both species), lower osmotic potential (I. vomitoria), and lower symplastic water content (S. minor) – all of which are symptomatic of water stress. The chlorophyll a fluorescence responses indicate that there were no differences in potential- and effective-quantum yields, but there were significant decreases in fluorescence performance index for ridge I. vomitoria and swale S. minor. While the data does support potential water-stress conditions in ridge plants of both species, it also suggests that they use different physiological processes to tolerate hydrologically dynamic systems such as ridge-swale maritime forests.
WATER QUALITY AND AVAILABILITY DIFFERENCES IN RURAL AND URBAN SRI LANKA

Julia M. Crowley (Dr. Crista Arangala) Department of Environmental Studies and Mathematics

Sri Lanka is a developing nation where rapid transformation of the landscape, an evolving economy and the strains of climate change are making water quality and availability an issue of great importance. Especially vital in this changing dynamic is the difference between access and quality of water in rural and urban communities. Through three weeks of observation and the surveying of Sri Lankan residents, I have found interesting trends that help add to the building literature on this topic. A comprehensive IRB compliant survey conducted included questions on source and preparation of drinking water, the prevalence of water borne diseases as well as Sri Lankan’s happiness with the quality of their water. Students of a rural community in Panangala were surveyed as well as attendees at the Leaders in Environmental Advocacy Forum in Colombo.

As communities start to see the negative effects of development and climate change on their water quality and availability they will need to know the causes in order to create and implement solutions. Being able to see any correlation between the source of drinking water and prevalence of water borne illness will benefit communities trying to better their existing quality. I found a much lower rate of water borne illness than expected however, those who had suffered from one were rural as opposed to urban. The practice of boiling drinking water was higher among rural residents than predicted, however the percentage of urban residents who always boiled their water was higher, this information is valuable in determining where education efforts on water safety should be directed. Statistical methods were used in order to compute these findings and recommendations will be made for further research studies.

Information is still needed about the level of water demanded by rural and urban future development as well as a better understanding of the type of pressure this may put on limited fresh water resources. Sri Lanka is its own case, however analysis of their water quality and availability, and thoughts towards their future, will resonate throughout the developing world as water becomes a more pressing issue in the coming decades.

THE IMPACT OF HUMAN SCENT ON EFFICIENCIES OF CAMERA TRAPS IN WILDLIFE STUDIES

David J. Muñoz (Dr. Joshua Kapfer) Department of Environmental Studies

In order to make smart decisions in regards to biodiversity, knowledge about the various species in question is required. In studies regarding wildlife ecology and conservation, camera trapping has therefore become increasingly widespread, especially for rare and endangered mammals. Camera traps are, on the most basic level, high quality infrared motion-sensor cameras. Being a novel technique, there are gaps in the knowledge, specifically how human scent affects the capture rates of cameras. In an effort to fill these gaps, we deployed four camera traps (Reconyx™ HC600; Holmen, WI) in each of two treatments (“human-scent masked” and “human-scent unmasked”) on a 40 acre property adjacent to the Haw River (Alamance County, NC). Random locations for camera trap placement were determined via Geographical Information Systems (GIS) at eight locations on-site, and all cameras were mounted facing active wildlife trails in early spring 2011. After an initial baseline data collection period, treatments were applied when researchers checked cameras every two weeks for basic maintenance (i.e., checking batteries and downloading pictures written to camera memory cards in the field). Human scent-control for the “scent masked” treatment was accomplished during camera maintenance via commercial scent-control clothing, and scent-masking chemicals that was applied prior to entering the study site to conduct maintenance for cameras in this treatment. No effort was made to control human scent when conducting camera maintenance in the “scent unmasked” treatment. A total of 2027 pictures were taken by cameras, with 1155 taken by scent unmasked cameras and 872 by scent masked cameras. Species identified were Odocoileus virginianus (White-tailed deer), Canis latrans (Coyote), Sylvilagus floridanus (Eastern cottontail), Sciurus carolinensis (Gray squirrel), Procyon lotor (Raccoon), and Didelphis virginiana (Virginia opossum). Capture rates during the treatment period were analyzed, and compared to baseline capture rates during a no treatment period. The current results indicate that no substantial difference existed between the two treatments and baseline data collection period. This conclusion is important because it can influence how camera studies are done globally, and it can prevent unnecessary costs.
THE IMPACTS OF IMPERVIOUS SURFACE CHANGE ON WATER QUALITY IN ALAMANCE COUNTY: 1984-2010

Samuel T. Shoge (Dr. Ryan Kirk) Department of Environmental Studies

This study evaluated the extent of and changes to impervious surface area in Alamance County, NC, and in a study watershed, the Little Alamance Creek, over the past 25 years. Impervious surfaces, such as roads, parking lots, and buildings, are areas in which water will not infiltrate into the ground. Impervious surfaces are a primary contributor to nonpoint source pollution in our waterways. This project had two goals: 1) quantify changes in impervious surface using aerial photo interpretation and satellite image classification, and 2) identify watersheds at risk for irrecoverable water quality decline using an established water quality model. The impervious surface in Little Alamance Creek increased by an estimated 22% from 1984-2010, and the impervious surface in Alamance County increased 24% from 1993-2005. A total of 8 watersheds are identified as being at high-risk for not supporting sustainable levels of biological integrity, with 4 of those watersheds gaining high-risk status between 1993-2005. This research was conducted during the 2010 Summer Undergraduate Research Experience.

ENZYME ACTIVITY IN THE HYPORHEIC REGION OF PIEDMONT STREAMS

Danielle N. Whitman (Dr. Janet S. MacFall) Environmental Studies Department

Streams and rivers are the source of our drinking water, scenic beauty, recreational opportunities and wildlife habitat. Unfortunately, increased urbanization has reduced riparian cover and changed runoff patterns, leading to changes in natural stream flow that result in flooding and erosion. As the number of stream restoration projects continues to grow, the depth of restoration criteria that needs to be addressed during planning and implementation must expand. The goal of this research project was to establish baseline measurements that could be used as assessment tools based on biochemical and microbial characteristics. This research focuses on the hyporheic region of soil. Five major enzymes involved in nutrient cycling within soil were examined. These enzymes included phenol oxidase, protease, acid phosphatase, β-glucosidase, and β-galactosidase. Preliminary data collected during the summer of 2010 indicated a correlation between degree of erosion—determined by bank height—and enzyme activity for phenol oxidase, acid phosphatase, β-glucosidase, and β-galactosidase. Generally, bank height was used as a measure of erosion with bank height ranging from 15 cm to 244 cm. Effect of depth was also measured by comparing surface to 20 cm deep. There was a difference shown in acid phosphatase and protease activity with greater activity in surface soils.

A NEW LOOK AT ENVIRONMENTAL ATTITUDES: RELATIONSHIPS TO OTHER SOCIAL ISSUES

Elizabeth Ann Winchester (Dr. Aaron Peeks) Department of Sociology

This study examines the correlations and connections between four different social issues: attitudes towards the environment, gender, race, and sexuality. While research consistently finds a relationship between a person’s attitudes and their subsequent behavior more recent research has speculated that a persons’ attitude toward one social issue may be related to other social issues. 1000 randomly selected students were emailed a survey composed of several scales measuring attitudes toward the environment, gender, race/ethnicity, and sexuality. Since previous research has shown that relationships may exist between some of these issues, this study seeks to explore whether a student’s attitude toward one of these social issues, such as environmental attitudes, would be similar to their attitudes towards the other three. This project seeks to accomplish three goals: 1) to understand the environmental attitudes of Elon students; 2) to understand whether partnerships between different Elon University organizations addressing the environment, gender, race/ethnicity, and sexuality are warranted and; 3) add to the body of literature exploring the relationships between these social phenomena. After retrieving feedback and analyzing data in SPSS, it was found that there was a positive correlation between all four social issues, with some connections being stronger than others. This research suggests that the relationships between various social
issues are topic specific, but these relationships do exist, and partnerships between different organizations on Elon’s campus are warranted.

**EXERCISE SCIENCE**

**IMPACT OF A MULTI-FACETED INTERVENTION IN INCREASING PHYSICAL ACTIVITY AMONG STUDENTS ON A COLLEGE CAMPUS**

Sarah A. Baker and Katelyn M. Barbiasz (Dr. Walter Bixby) Department of Exercise Science

The benefits of exercise are well known, including decreased risk of chronic diseases and obesity. However, most people don’t get enough exercise to maintain a healthy lifestyle. One of the major barriers preventing people from participating in physical activity is lack of motivation. Understanding how to motivate people is an important factor in promoting healthy behaviors among our society. **PURPOSE:** The purpose of this study is to determine the effectiveness of multiple theories in motivating students to increase physical activity on campus. **METHODS:** Our intervention will focus on increasing physical activity in a specific residential area on a college campus. The time frame of the study will be 3 weeks and will take place 1 week following spring break. The first week a questionnaire will be sent out and campus recreation facility usage will be measured to track physical activity of subjects. The questionnaire will include information about subjects’ thoughts on physical activity and their current physical activity status. During the second week, the intervention will be implemented and campus recreation attendance will be measured. The third week a follow-up questionnaire will be sent out to all subjects and campus recreation attendance will be measured. At the beginning of the intervention week an educational meeting will be held for all subjects. Throughout the intervention week information will be provided to subjects via email, campus mailboxes and point of decision prompts located within the residential areas to promote healthy habits. This information will include a detailed schedule of all physical activity opportunities occurring on campus daily, benefits of exercise, strategies to stay active and motivational expressions. Events will be held during the intervention week at the main exercise facility to increase interest and motivation to participate in physical activity. For example, subjects will be encouraged to attend the fitness center with a buddy or a group to watch a television show together. It is hypothesized that the targeted group’s physical activity will increase based on self-reported exercise and campus recreation attendance and that the typical barriers to exercise will be reduced compared to a control group.

**PHYSICAL ACTIVITY AND EXERCISE ADHERENCE IN COLLEGE STUDENTS: THE EFFECT OF A MULTIPLE-PSYCHOLOGICAL THEORY BASED EXERCISE INTERVENTION**

Stuart H. Batten, Robert B. Rosell (Dr. Walter R. Bixby) Department of Exercise Science

Consistent physical activity is integral to living a healthy lifestyle. The transition from high school to college has been identified as a critical period of lifestyle change in young adults. The American College Health Association has reported 36.7% of college students were overweight or obese based on height and weight values. Overweight college students are at risk of becoming obese adults; therefore, targeting this population with exercise interventions with the goal of increasing physical activity is warranted. **PURPOSE:** The purpose of this investigation is to increase physical activity and exercise adherence in students on campus using an exercise intervention based on multiple psychological theories. **METHODS:** Physical activity questionnaires will be sent out via campus email the first and third week following spring break. Tracking of campus recreation facility usage will be reported during the three weeks of the study. The second week following spring break, the exercise intervention will be implemented to a target residence area of campus. The intervention includes posters promoting physical activity, outlining benefits and minimizing barriers. Posters also will include offers of instructional and orientation sessions to be provided to students at the on-campus fitness center. An inter-residence hall competition will also be included as incentive, with the area with the most physical activity getting highlighted in a campus-wide email sent out by administrative staff members. Informative emails will be sent out on a daily basis to residents during the intervention week outlining the benefits of exercise as well as informing them of the
competition between residence halls. RESULTS: It is hypothesized that a one-week exercise intervention will cause an increase in physical activity in a target residence area on campus. Increased usage of the campus recreation fitness center, maintained adherence to physical activity, and increased knowledge about the benefits of physical activity is expected in students following the intervention.

THE IMPACT OF VARYING CARBOHYDRATE-ELECTROLYTE SOLUTIONS ON EXERCISE PERFORMANCE IN THE HEAT

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Fatigue during prolonged exercise is a predictable phenomenon. A mediator of fatigue has been thought to be carbohydrate-glycogen depletion and dehydration. The breakdown of glycogen may be a vital contributor of energy during prolonged exercise; therefore, carbohydrate depletion may be a significant contributor to fatigue and impaired performance (Lima-Silva et al., 2009). Exercise in warm environments can exacerbate this effect. Consuming carbohydrate-electrolyte solutions (CES) with the goal of mitigating these effects is routine among athletes. While the efficacy of this strategy is well documented, it is likely that drinks of differing formulations may have varied effectiveness. PURPOSE: To assess the effectiveness of ingesting a 6% CES and a 2% CES on exercise performance in a warm environment.

METHODS: 6 college-aged men completed 4 testing sessions. During session 1, participants completed a graded exercise test and ventilatory threshold (VT) was identified. A practice 10-km time trial on a cycle ergometer was completed in session 2. Sessions 3 & 4 involved completing a 3 hour ride on a cycle ergometer at 60% VT in a heat chamber (32°C, 70% humidity). Each participant was given either a 2% or a 6% CES (5 ml/kg bw) every 30 min during sessions 3 & 4. Sessions 3 & 4 were randomized and counterbalanced and the treatments were double-blind. Physiological variables (HR, blood glucose, & core temperature) and perceptual variables (RPE & affect) were measured every 30 min throughout the trial. After 3 hours of exercise in the heat, each participant remained in the heated environment to complete a 10-km time trial and time to completion was recorded. RESULTS: A significant condition effect was seen for core temperature, with the 6% CES showing a 0.3°C higher core temperature (p=0.02). No other variables showed a significant condition effect. CONCLUSION: These data suggest that 6% CES drinks and 2% CES drinks may have similar effects on prolonged exercise performance in the heat at this intensity. This would indicate that consumption of either drink may be beneficial for exercise performance and that the individual should select the drink that more closely aligns with their training goals and caloric needs.

MOTIVATING UNIVERSITY STUDENTS TO EXERCISE USING THE CONSTRUCTS OF THE SELF-DETERMINATION THEORY

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BACKGROUND: It is understood that exercise is necessary to live a healthy lifestyle. Currently only twenty five percent of the population exercises at a level to achieve health benefits. Motivating people to exercise is challenging, but it is the key to increasing exercise habits. The Self-Determination Theory provides a framework to motivate students to exercise. PURPOSE: The purpose of this study is to increase physical activity (PA) on campus using an exercise intervention based on the Self-Determination Theory. METHODS: Participants will receive one week of daily information via email concerning exercise motivation based on the Self-Determination Theory as well as health benefits of exercise two weeks after returning from spring break. In addition, they will receive flyers containing the exercise classes offered by the campus recreation department. Questionnaires assessing physical activity and attitudes towards physical activity will be completed the week after and three weeks after spring break. Attendance at campus recreation facilities will be tracked for the three week period following spring break. Information in the emails will begin with the ideas of extrinsic motivation including: rewards of exercise, the obligation to exercise using the buddy system, setting personal goals, and instilling the concept that participating in daily exercise can increase a sense of self. The final email will be to inform the participant that the ultimate goal is to become intrinsically motivated to exercise. HYPOTHESIS: It is hypothesized that the intervention will cause an increase in physical activity and an improvement in attitudes towards physical activity during the intervention week and the one week period post-intervention.
THE INFLUENCE OF CONCUSSION HISTORY ON COGNITIVE PERFORMANCE IN COLLEGE ATHLETES

Robert A. Gardner, (Dr. Eric Hall) Department of Exercise Science

In the U.S., approximately 300,000 sport-related traumatic brain injuries occur each year (Sosin, Sniezek, & Thurman, 1991; Centers for Disease Control, 1997). Student-athletes, specifically in sports such as soccer and football, have a high risk of concussions because of the high amount of contact. Despite known short-term effects of concussions, there is ample support for long-term decrements in cognitive function as measured by the event related potential (ERP) component. The ability to see changes in ERP components suggests that there may be damage to the neuroelectrical pathways in the brain (Broglio, Pontifex, O’Connor & Hillman, 2009). PURPOSE: This research project investigated the influence of concussion history on cognitive function in student-athletes. METHODS: One hundred student-athletes from football (n = 59), men’s soccer (n = 23) and women’s soccer (n = 18) participated in the study. Each participant completed the Immediate Post-Concussion Assessment Cognitive Testing (ImPACT™). Additionally, EEG was recorded to determine ERPs during the Eriksen Flanker Task and an auditory oddball task. RESULTS: The ImPACT™ found that verbal memory was worse in those who have previously had a concussion versus those with no history (p = 0.013). The Flanker Task yielded significant differences for percent correct in congruent trials (p = 0.033). Evidence was found that the P3 ERP component was influenced by concussion history with those suffering from a previous concussion to have larger latency at site Pz for the incongruent trials of the Flanker Task (p = 0.038). The auditory oddball task provided additional evidence in greater P3 amplitude for those with a concussion history at size Pz (p = 0.007). Nonsignificant trends were found at FCz (p = 0.10). Both latency and amplitude are thought to represent decrements in cognitive processing of stimuli. CONCLUSIONS: The present study found concussion history to have an influence in cognitive processing in student-athletes. These decrements in processing can have an influence on quality of life in those with a concussion and needs to be explored more.

RELIABILITY OF THE THREE POINT SHOE TEST

Andrew P. Genova and Francesco P. Worley (Dr. Joyce A. Davis) Department of Exercise Science

The use of different types of athletic shoes, tailored to ones unique biomechanical properties, is often cited by manufacturers as a method to increase performance and decrease injury. Shoe manufacturers make a variety of claims regarding their product but it can be difficult and confusing for consumers to determine if one shoe is better than another. Shoe rating methods are often subjective in nature with little or no scientific support. The ‘wet test’ for example, consists of standing with a wet foot on a piece of paper to examine the shape of a person’s arch in order to determine the best type of shoe however studies conducted during U.S. Army basic training did not support the use of the wet test. (Swedler et al., 2010; Knapik et al., 2009). Wear-testing is another common yet subjective method for evaluating running shoes based on comfort and fit. This method does not take into account the ability of the shoe to provide adequate motion control, flexibility or stability of the foot.

The American Academy of Podiatric Sports Medicine has adopted a three-point test developed by Mark Reeves (DPM) to evaluate athletic shoes. This technique assesses the heel counter firmness, torsional control, and flexibility of the shoe. It provides a quick and easy way to compare one shoe to another however the reliability of ratings has not been reported. The purpose of this study was to examine the inter and intra-related reliability of the three-point shoe test. Shoes (N = 55; Mean Price $61.29) were selected from three different retailers. The three point test was independently performed on each shoe by two researchers. The test was repeated four weeks later. Test results yielded significant (p <.001) inter-related correlations for heel counter firmness (r=.91), flexibility (r=.83), and torsional control (r=.85). Tests also yielded significant (p <.001) intra-related correlations for all three categories with r values ranging from .89 to .94. These results provide support for use of The American Academy of Podiatric Sports Medicine three-point test as a reliable measure to examine quality of shoe structure.
PREVENTING EXERCISE RELAPSE AFTER SPRING BREAK

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BACKGROUND: It is commonly accepted that physical activity can reduce the risk of various diseases and is directly associated with an improvement in quality of life. Many people do not meet the ACSM recommendations for exercise. Research suggests that 32% of adults in the U.S. are obese and 34% are considered overweight. An exercise intervention could hopefully improve these statistics. PURPOSE: The purpose of this study is to examine the effectiveness of an exercise intervention on a college campus that utilizes multiple psychological theories, with a focus on the relapse prevention model. METHODS: The study will take place over a 3 week period. The first week will be the week after the students’ spring break. During this week data will be collected through questionnaires and by tracking fitness center attendance. During the second week an exercise intervention will be implemented and fitness center attendance will be tracked. The week following the intervention we will recollect data through the same questionnaires and by tracking fitness center attendance. The exercise intervention will increase awareness through various methods such as information session, flyers and emails. The intervention will primarily be based on the relapse prevention model. The relapse prevention model is a psychologically based theory that is used to aid in physical activity adherence. It is specifically designed to help people who are already exercising maintain their level of activity and avoid a relapse. This applies to our study population who will be coming off of an exercise routine that was intended for spring break preparation. The specific methods will involve information sessions, flyers and emails. Information sessions will be designed to educate students about easy exercise options available to them, how to cope with restrictive circumstances and subsequently provide motivation and confidence building tools. HYPOTHESIS: We hypothesize that this intervention will help maintain fitness center attendance and a positive mentality towards exercise after spring break.

DO EXERGAMES ALLOW CHILDREN TO ACHIEVE PHYSICAL ACTIVITY INTENSITY COMMENSURATE WITH NATIONAL GUIDELINES?

Courtney A. Graham, Rachel M. Perron, Jamie R. Feldman, and Rebecca A. Moffett (Dr. Eric E. Hall) Department of Exercise Science

The increasing rates of obesity and decreasing physical activity rates in children are becoming a major problem in the United States. In recent years, video game companies have developed a potential solution to this problem: exergames, or video games in which players are required to move much more than in traditional video game play. One study found that active video game play is similar in energy expenditure as moderate-intensity walking (Graf et al., 2009). The purpose of this study was to determine if two popular exergames, Wii Fit and EA Sports Active, helped children to achieve an intensity consistent with recommended physical activity guidelines. Thirty children (19 males and 11 females, Mean age = 9.4 ± 1.8 years) participated in this study. Participants completed one research session lasting 60 to 75 minutes. The participants were randomly assigned to play one of the games for 25-30 minutes. A short rest was given before the other game was played for the same time. During the session participants wore a heart rate monitor and accelerometer to measure exercise intensity. Perceived exertion was measured with the children’s OMNI scale. Using accelerometers, we found a significant difference for game which was due to greater light activity occurring in the Wii Fit game at 60% of minutes (p < .001) and greater moderate activity in the EA Sports Active game at 65% of minutes (p < .001). Mean heart rate during EA SPORTS Active was 144.0 ± 8.0 bpm compared to Wii Fit, 136.5 ± 9.6 bpm. This is equivalent to 68% and 65% age-predicted HRmax and would be considered moderate intensity. It was also found that perceived exertion in the EA SPORTS Active game was higher. When using heart rate as an indicator of exercise intensity it appears that both games for the Nintendo Wii were of sufficient intensity to achieve physical activity guidelines. However, the accelerometer data does not support this conclusion. Location of the accelerometer placement on the body may be contributing factor. Future studies should continue to investigate the utility of exergaming in helping children to become more physically active.
THE KINEMATIC DIFFERENCES BETWEEN NOVICE AND ADVANCED DANCERS WHEN PERFORMING TENDUS, DÉGAGÉS, AND BATTEMENTS

Bridget A. Kelly (Dr. Caroline J. Ketcham) Department of Exercise Science

The purpose of this study was to determine the biomechanical differences between novice and advanced dancers when completing movements of increasing complexity. A novice group and an advanced group, each with 6 participants, performed tendus, dégagés, and battements to the front, side, and back on both their dominant leg. This was repeated to the side and back, with blocks of trials in a randomized order. Reflective markers were placed on anatomical landmarks of the torso and lower limb. A video camera (30Hz) was placed in the frontal plane. Body position was measured to examine any sway that occurs in the body and the kinematics of joints was measured in order to determine how the angles of the joints shifted during movement. HuMan movement analysis software was used to digitize and analyze the kinematic data. Observational data revealed that rotation of the torso occurred in all of the novice dancers, while 50% of advanced dancers had slight rotation. Both groups showed increased movement as the working leg was brought to higher levels (p<.05). The calculated data revealed that the amount of motion in the hip joint increased as the leg height increased. The knee and trunk showed a similar amount of movement during the battements. The overall movement differences between the novice and advanced groups varied, yet there were no significant group effects for any measure (p>.05). The observable differences between novice and advanced dancers took place primarily during the transition phase between movements, which explained the discrepancies between the observed and calculated data. The analysis focused solely on the dancer while he/she was moving the leg, not the time between trials. The implications of the data suggest that dancers may need to alter their form slightly in order to perform certain movements safely, yet the aesthetic quality can remain intact.

THE EFFECTS OF AN ACUTE OVERSPEED WARM-UP ON SPRINT PERFORMANCE IN COLLEGIATE ATHLETES

Jordan T. Lee (Dr. Walter R. Bixby) Department of Exercise Science

Overspeed training, which can be performed in various ways like the use of elastic cords or downhill slopes, accelerates the athlete to speeds above that which they could achieve in flat running. To date, no research has directly examined the use of overspeed training in a warm-up to improve subsequent sprint performance. PURPOSE: To determine whether an acute overspeed warm-up before a short sprint (60 M) can improve time and stride length. It was hypothesized that overspeed warm-ups would decrease time and decrease stride length compared to a traditional warm-up. METHODS: Participants (23, 12 female) completed two days of counterbalanced testing which consisted of a 10-15 minute warm-up of choice followed by one timed and videotaped 60-meter dash. On one of the two days, participants also completed four bungee runs after the warm-up but prior to the 60-meter dash. RESULTS: A 2 (condition) by 3 (segment; 0-20M, 20-40M, 40-60M) repeated measures GLM for time revealed a significant segment effect but no significant condition effect, $F(2, 40) = 500.62, p < .01$. Time was significantly greater for the first 20 meters (3.36±.05) than the second 20 meters (2.41±.03) or the third 20 meters (2.46±.05) which were not different. The condition by segment interaction failed to reach significance, $F(2, 44) = 3.07, p = .08$. A 2 (condition) by 4 (segment; 0-10M, 10-20M, 25-35M, 45-55M) repeated measures GLM for stride length revealed a significant segment effect but no significant condition effect or condition by segment interaction, $F(3, 60) = 287.06, p < .01$. Stride length in meters from 0-10M (1.37) was shorter than that from 10-20M (1.86), 25-35M (2.06), and 45-55M (2.10). Stride length from 10-20M was shorter than that from 25-35M and 45-55M while there was no difference between 25-35M and 45-55M. CONCLUSION: While no significant differences were found between the overspeed warm-up and the traditional warm up, absolute differences were observed. It is possible that this small difference could have an impact on results. Further research is needed to determine the impact of this absolute difference.
KINETICS AND KINEMATICS OF PASSÉ RELEVÉ BALANCE IN DANCERS

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The core muscle activation patterns were examined in 15 college-aged trained dancers and 15 college-aged non-dancers as they performed a series of balances necessary in ballet. The primary focus was on the one-leg passé balance both on a flat foot and a relevé (on the ball of the foot) with the aim of pinpointing the muscle activity while balancing. The participants performed each balance on the left and right legs as well as a series of standing control protocol in randomized sequence. The left and right abdominals, left and right obliques, and left and right erector spinae were studied using Delsys® surface electromyography equipment and analysis software. Each set of data was put through an absolute value equation and then filtered with a 10Hz, low-pass, 2nd order, Butterworth filter. The trials were then normalized to a percentage of max voluntary contraction. Following a repeated-measures MANOVA, results show that the two groups are using different balance strategies between right and left legs, particularly during the relevé condition. More specifically, differences were viewed in the strength of contraction for the obliques (p<.05). This strategy lent itself to the dancers’ ability to maintain all required balances for a longer period of time (p<.05). Individually, it also appears that the dancers contracted the muscles more consistently than their non-dancer counterparts. The implications of this research will help dance scientists to better understand the control necessary to maintain a balance. Furthermore, these findings can help dance instructors implement proper technique during training in order to prevent injuries. Supported by Elon University Honors Program award to Krysten Malcolm.

EXERGAMING IN ADULTS: CAN APPROPRIATE INTENSITY LEVELS BE ACHIEVED FOR HEALTH BENEFITS?

Rachel M. Perron, Courtney A. Graham (Eric E. Hall) Department of Exercise Science

Over 30 percent of American adults are now categorized as obese. Major factors contributing to these high levels of obese individuals include an unhealthy diet and a lack of exercise. Exercise games have been created and marketed as a way to incorporate physical activity into previously sedentary video games. These “exergames” require players to move their limbs to control on-screen characters rather than just pushing buttons from a sedentary position. PURPOSE: To compare treadmill walking to exergame play on the Nintendo Wii. METHODS: Thirteen male and 17 female participants spent 30 minutes walking on the treadmill and approximately 30 minutes playing EA Sports Active’s “Island Cardio Blast.” Heart rate monitors and accelerometers were used as an objective measure of intensity and the Rate of Perceived Exertion (RPE) was used as a subjective measure of intensity. Participants also rated themselves on the Feeling Scale (FS) and the Felt Arousal Scale (FAS) following completion of exercise. RESULTS: Participants had a significantly higher HR, RPE, and minutes spent in moderate or higher-intensity activity during the Wii play (p’s < .001). The Wii also elicited a significantly higher ranking on the PACES (p < .01). A significant time (p < .001) and time*condition interaction (p = .028) were found for the FS and FAS. This was due to an improvement in FS over time and FS being greater in the Wii condition post exercise. CONCLUSION: Play on the EA Sports Active game for the Nintendo Wii elicited higher physiological and psychological measures, indicating that it may be a good mode of exercise.

THE RELATIONSHIP BETWEEN PERSONALITY, MOTIVATION TO EXERCISE, AND PHYSICAL ACTIVITY HABITS

Meredith L. Ramsey (Dr. Eric Hall) Department of Exercise Science

Ingledew, Markland, and Sheppard (2004) conducted a study that compared personality traits to self-determined behavior in exercise for individuals in the maintenance stage of behavior change. The goal of the present research was to replicate this study to determine the relationship between personality, motivation to exercise, and physical activity habits. Forty-six individuals (17 males) in the maintenance stage of exercise were used for the preliminary data analysis. Subjects completed the International Personality Item Pool (Goldberg, 1999), the Behavioral Regulation in Exercise Questionnaire-2 (Markland, 2000), and the Godin Leisure-Time Exercise Questionnaire (Godin, 1985). Results indicated that
KINEMATICS OF AIMING MOVEMENTS IN 2 – 5 YEAR OLD CHILDREN

Julianne A. Taylor (Dr. Caroline J. Ketcham) Exercise Science

Fine motor control is essential in order for individuals to produce smooth and efficient movements of the fingers and wrists. Hand motor control progression indicates development of the central nervous system in coordination with muscle strength in the muscles involved in those movements. Children engage in activities such as handwriting and drawing that require fine motor development. Although there is a lot of research on hand motor control in school-aged children, more research needs to be done in younger preschool aged children. This study aimed to quantify specific kinematic variables that measure fine motor control in children ages 2-5. The researchers tested 25 children from the First Presbyterian Child Development Center in Burlington, NC. The experiment consisted of a two target drawing experiment using a program called MovAlyzeR. Using a display digitizing screen and a digital pen, children were instructed to draw a line connecting two targets on the digitizing screen. Distance between the targets (5cm and 10 cm) and size of the targets (.5cm and 1cm) were manipulated, creating four separate conditions ranging in Index of Difficulty (ID) from 2.58 – 4.58. Conditions were randomized, providing 5 trials for each condition for a total of 20 trials. Preliminary results revealed that 5 year olds produced significantly faster movement times, had higher peak velocity, and smoother movements when compared to the 4, 3, and 2 year olds. In addition, 4 year olds had more submovements than the other age groups, indicating that they were less accurate with their preplanned movement and relied more on feedback for accuracy, while the two and three year olds were overall more focused on speed regardless of condition. Overall, the five year olds produced movements that were developed. Finally our results were consistent with Fitt’s Law, with the low IDs reporting the shortest movement times and the high IDs the longest movement times for all groups. Implications of this work will help standardize fine motor development in typical children using kinematic variables and thus help identify children with motor delays earlier for intervention.

FINE AND GROSS MOTOR SKILL DEVELOPMENT IN PRE-SCHOOL AGED CHILDREN

Lindsey Wolson, Bridget Cashen (Dr. Caroline J. Ketcham) Department of Exercise Science

Both fine and gross motor skills are key components to cognitive and motor development. Fine motor skills help build the foundation for a variety of skills for young children. As they advance through childhood they will begin to enhance these skills allowing them to perform activities. These lead to independency and self-sufficiency. There is very little prior research that addresses their relationship between fine and gross motor skills in this age group. The purpose of the study was to investigate the relationship between gross and fine motor skills in children 3-5 year olds. Researchers tested 27, 3-5 years olds, from the First Presbyterian Child Development Center in Burlington, NC. Parents were informed about the study and signed an informed consent form prior to the beginning of testing. Four preschool classes were visited for two-hour sessions, and individuals in the same age group were assessed on their fine and gross motor skills. Fine motor consisted of drawing their family, stacking blocks, and the Purdue
pegboard test. Gross motor skills were assessed by hopping, leaping, balance on one leg, and catching. Preliminary results found correlations between fine and gross motor skills. Development of these skills was primarily related to age, although in some cases children were stronger in either fine or gross, but not both. Those who had trouble with one set of skills also were deficient in the other. Future directions are aimed extending this research to children with developmental delays. Of interest is whether a focus on gross motor skills will in turn help fine motor skills.

FOREIGN LANGUAGES

FROLICS IN LYON: MY 6 MONTHS IN FRANCE’S SECOND CITY

Abby R. Broughton (Dr. Sophie R Adamson) Department of Foreign Languages

In the context of study abroad, travel writing is currently an overlooked genre within the broader spectrum of creative non-fiction. After extensive research, my findings show that wide-ranging Internet blogs document study abroad experiences, yet few would qualify as literary sources. In presenting my research, I use an accompanying blog to explore and compare different mediums of writing, intentions and audience accessibility. In addition, I aim to fill the void by offering an excerpt of my own creative non-fiction personal narrative that details a study abroad experience in Lyon, France. My piece follows the life of a student during the spring of 2010 living in international housing, taking classes in a non-native language, and coping with strained French-American relations. It is written by a student for other students and travel writing enthusiasts who are interested in learning about living abroad and cultural exchanges outside of a touristic perspective. In sum, this presentation is interdisciplinary and integral as it is both a research and a literary endeavor. It provides helpful scaffolding regarding the prevalence of various styles of travel writing while sharing an excerpt of my own creative non-fiction that, I hope, fills a void.

JUDGMENT AT NUREMBURG: DEFINING A SOCIETY THROUGH FILM

Caitlin E. Clarke (Dr. Scott Windham) Department of Foreign Languages

The release of Stanley Kramer’s 1961 film “Judgment at Nuremburg,” 16 years after the end of Nazism and the Holocaust, served to stir up emotions from an event that had been largely ignored following the war. In the aftermath of World War II, German nationalism was suspect, and Germany was seen as the face of a nationalist monster that caused the destruction of an entire continent, the loss of millions of lives and the creation of stereotypes and tensions that still color foreigners’ views of Germany and the Germans. Judgment on the Germans’ murder of millions of Jews and other “undesirables” was left to the rest of the world, and this judgment affected not only the top military perpetrators but also the entire German nation and its culture and society.

Kramer’s film seeks to address these issues of judgment and stereotypes. Kramer successfully juxtaposes German and American judges in order to demonstrate what can happen when a society puts political ambition above moral and legal integrity. My research illustrates how “Judgment at Nuremburg” helped to solidify an image of Nazi Germany as a failed society that followed orders rather than morals. I will use close readings of key scenes in the film, an analysis of filmic strategies such as camera angle and the use of shadow, and an engagement of scholarly criticism to illustrate how images portrayed in film help shape contemporary understanding of Germans. Additionally, the film provides insight on American society in the 1960s, with its references to Cold War politics.

GÜNTER GRASS THROUGH THE LOOKING GLASS: THE MEMOIR OF A ONCE BELOVED HOLOCAUST PERPETRATOR

Melissa B. Kansky (Dr. Scott Windham) Department of Foreign Languages

My research project examines how Günter Grass portrays himself in his memoir Peeling the Onion, and how representative he is of German citizens living with the guilt of their past participation in Nazism. Prior to the publication of Peeling the Onion, in 2006, Günter Grass was a renowned academic figure. Because of his willingness to remind fellow Germans of their criminal past, he earned the respect of the German
people, the admiration from citizens of various nationalities, and the Nobel Prize in Literature in 1999. The revelation of this honorable character's participation in the Waffen-SS, a military wing of the Nazi Party, caused a controversy throughout the world regarding how much admiration this man still deserves. Although, as a respected public figure there has been more controversy surrounding his identity, his story still represents that of many typical German citizens.

My project includes an examination of German culture, collective memory and literature. I intend to investigate the question regarding how representative Grass is of the German population at the time and how we should now view this author. I will undertake this investigation by analyzing the text in the memoir, with the aid of scholarly articles that address the memoir and the current perception of Grass. Thus far in my project, I have considered works by critics John Irving, Stuart Taberner and Helena da Silva, along with theoretical considerations from Hannah Arendt, whose work includes thoughts on collective guilt and individual responsibility. I plan to broaden my review of scholarly literature and further examine how public opinion of Grass has changed.

My preliminary conclusion is that the revelations of the author’s portrayal of himself as an artist throughout this memoir asks readers to dismiss his participation in the Waffen-SS and, instead, focus on his contributions to art, literature and the intellectual world. His identity as an artist, the driving force throughout his memoir, permits his audience to ignore his participation in the Holocaust. Critics’ emphasis on his identity as an artist signifies their reluctance to accept Grass’s contribution to Nazism and fear of admiring an individual responsible for the Holocaust.

FRENCH AND AMERICAN PERCEPTIONS REGARDING THE ROLE OF SOCIAL MEDIA IN THEIR UNDERGRADUATE STUDY ABROAD EXPERIENCE

Amy R. Kenney (Dr. Sophie Adamson) Department of Foreign Languages

Students often recognize that a study abroad experience will be one of the most challenging yet rewarding times of their life. Studying in a foreign country allows students to explore their boundaries, experience other cultures, and learn to appreciate different perspectives and worldviews. Universities are acknowledging the importance of such an experience worldwide, and student interest and participation in study abroad programs is steadily increasing. However, the rise of social media in maintaining intra- and inter-personal relationships has a definite impact on undergraduate students’ study abroad experience. There has been incredible growth in online social networking with the emergence of Facebook and Twitter, videoconferencing systems such as Skype and iChat, and the flourishing international blogosphere. This project looks at French and American perceptions regarding the influence of social media in their study abroad experience. With the participation of current international students from France and past study abroad participants from Elon, I look at the extent of their use of different social media outlets and their perceptions of its influence on the quality of their study abroad experience. Levels of homesickness and assimilation will be addressed, as will students’ goals for their study abroad experience and whether those goals were achieved. In sum, this project looks at study abroad through the lens of social media and the implications of its usage on university students’ experiences abroad.

MADRES, MUJERES Y TRABAJADORAS: PROTESTA IMPLÍCITA POR CHILENAS EN PAULA (1973-1979) [MOTHERS, WOMEN, AND FEMALE WORKERS: IMPLICIT PROTEST BY CHILEAN WOMEN IN PAULA (1973-1979)]

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This project concerns the implicit political protest in women’s magazines, in the magazine Paula, during Pinochet’s dictatorship (1973-1990) in Chile. The central questions of this project are 1) what were the motivations that led to Chilean women’s subversion of the government, 2) how did Chilean women’s traditional roles in the patriarchal culture enable them to subvert the dictatorship through non-traditional means by exploiting the traditional, gendered expectations, 3) specifically, how was the discussion of sexual themes and women in the workplace used to implicitly protest against the dictatorship. The
methodology consisted of examining editions of Paula for articles dealing with sexual themes and mothers in the workplace. The most representative articles were chosen and analyzed for implicit political protest. The anticipated conclusions of the project are three-fold. Chilean women were motivated to protest against Pinochet’s government because its political policies of repression and neo-liberal economic plans attacked the home environment and threatened the family. By manipulating their traditional role as guardians of the home which the government promoted, Chilean women were able to enter into the public sphere and through creative methods effectively subvert the government. The problematization of sexual themes and the entrance of women in the workplace functioned as a useful method of protest because the women were able to suggest alternative forms of government and criticize institutionalized violence through the former and demonstrate the failings of the economic and social policies of the dictatorship through the latter. Therefore, the private was politicized in women’s magazines and society so that Chilean women could effectively and creatively subvert the dictatorship through the impetus of their role as mothers.

HEALTH AND HUMAN PERFORMANCE

THE EFFECT OF SUPPLEMENTAL SUPPORT VIA E-MAIL AND TEXT MESSAGES ON PERCEPTIONS OF BODY IMAGE, SELF-ESTEEM AND SOCIAL SUPPORT IN 4TH AND 5TH GRADE PARTICIPANTS IN ALAMANCE GIRLS IN MOTION

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Research suggests that benefits associated with e-mentoring are similar to the benefits of face-to-face mentoring. The Alamance Girls in Motion program (A-GIM), a traditionally face-to-face mentoring program offering education on health topics and exercise, has been shown to improve perceived body image and self esteem and increase levels of physical activity in young girls. However, 1 yr after program completion these positive changes are no longer present. It is hypothesized that this is a consequence of the inability to effectively support former participants and a lack of parental engagement in the educational material presented in A-GIM. The purpose of this study was to investigate the effect of supplemental contact via text messages and e-mail on measures of perceived body image [Social Physique Anxiety Scale (SPAS) and 2 subscales of the Socio-cultural Attitudes Towards Appearance Scale; Awareness (A) and Internalization (I)]; self esteem [Rosenburg Self-Esteem Scale (SES)], and perceived social support [Multidimensional Scale of Perceived Social Support (SS)] following participation in A-GIM. Participants were randomly assigned to either the experimental group, which received additional contact reinforcing content from that week’s mentoring session and facilitated parental involvement, or to the control group. The control group only received the materials typically delivered in A-GIM. No differences were observed between the groups in any measure; however, the program was found to be effective as significant improvements from pre to post occurred in both groups for SE (SE\text{pre} = 21.8 \pm 0.94; SE\text{post} = 23.9 \pm 9.9; p=0.03), A (A\text{pre} = 21.8 \pm 0.83; A\text{post} = 17.3 \pm 0.82; p=0.0007), I (I\text{pre} = 23.68 \pm 1.4; I\text{post} = 14.3 \pm 1.5; p=0.002) and SPAS (SPAS\text{pre} = 28.9 \pm 1.8; SPAS\text{post} = 23.9 \pm 1.7; p=0.008). Qualitative assessments indicated that parent/child interactions around program content were increased in the experimental group, suggesting a potential pathway by which the observed positive outcomes could be maintained over time. Recommendations for further study include continuing supplemental contact and following up with both groups to determine if the positive changes observed can be more successfully maintained over a longer period of time.
HISTORY AND GEOGRAPHY

“HACIA EL BUEN CONVIVIR: EXPERIMENTS IN ‘DEVELOPMENT WITH IDENTITY’ IN THE ECUADORIAN AMAZON”

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Since the rise of Ecuador’s national indigenous movement in the 1980s, indigenous communities across the country have intensified efforts to design alternative development strategies that more appropriately accommodate their cultural identities. This paper is based on participant observation and interviews in the community of Rukullakta in Ecuador’s Amazonian province of Napo. It describes three innovative development initiatives that indigenous Kichwa communities have been involved in: intercultural bilingual education, fair trade, and community tourism. I will use these examples to highlight the ways in which Kichwa communities have conceptualized and applied novel approaches to natural resource management and cultural revitalization. While emphasizing local perceptions of development policies, I will describe how globalization has provided opportunities to form transnational alliances that support sustainable land use management and re-valuing of Kichwa cultural identity. My presentation will address these three examples within the context of the overarching ideology of “development with identity.” I use the term development with identity to refer to efforts by Kichwa communities to reconcile a desire to preserve cultural heritage with an interest in participating in a global economy.

ASSIMILATING ATHLETICS: THE ROLE OF FOOTBALL AT THE CARLISLE INDIAN BOARDING SCHOOL

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During the late nineteenth and early twentieth century, federal policy and popular opinion asserted that in order to survive, Indians had to abandon their “savage” identities in favor of white cultural norms. Education of Indian youths became the primary means for accomplishing this assimilationist goal. This research examines the success and failures of this process specifically through the use of football at the Carlisle Indian Industrial School in Carlisle, Pennsylvania. At its inception, football at Carlisle was fully supported by assimilationists, the white media and the Indian student body for the lessons it taught in adapting to mainstream American cultural values of discipline, physical fitness and individualism. The Carlisle team succeeded beyond anyone’s wildest expectations, becoming a football powerhouse that dominated its all-white competition. As a result, Carlisle garnered national media attention as well as massive athletic profits, which predominantly went to the benefit of coaches and players. At the height of its success however, growing criticism and charges of athletic and student misconduct, including a student-led petition, led to the disbandment of the team in 1917. The research concludes that while football at Carlisle was hailed by whites as an effective tool for assimilation, it eventually became a point of contention for whites and Indians alike because the program created a deeply flawed athletic culture that fundamentally contradicted the school’s mission. This research is important to the understanding of issues involving Native American education and assimilation during the early twentieth century, as well as the problematic nature of using athletics as a tool for assimilation. Important scholarship for the research included To Show What an Indian Can Do by John Bloom, Education for Extinction by David Adams and The Real All Americans by Sally Jenkins. Especially important primary sources included the Carlisle student newspapers from 1901-1914, as well as the New York Times and Washington Post.

LACROSSE AND PASSPORTS: TRIBAL SOVEREIGNTY IN THE 21ST CENTURY

Carl W. Dagger (Dr. Clyde Ellis) Department of History

The Iroquois Nationals lacrosse team, currently the only Native American squad to compete internationally in any sport, was expected by many to medal in the July 2010 World Lacrosse Championships in Manchester, England. Credited with inventing the sport over a thousand years ago, the Iroquois and their national team are revered in the world of lacrosse. But in a complex and confusing series of events, the
Nationals were ultimately barred from traveling to the tournament from JFK International Airport. The snafu stemmed from the team’s insistence upon using their tribally issued passports, the most visible expression of their sovereignty as a people. Recent legislation enacted to bolster border security in light of the 9/11 attacks stipulated stringency with respect to the Iroquois documents, hitherto recognized by the Canadian and US Governments. The most essential question that I sought to answer in my research was “What are the implications of claims to tribal sovereignty in a post-9/11 world?” Given the fact that 9/11 occurred not even ten years ago, its impact on the world is still being felt and extremely relevant to current international relations. The story is doubly intriguing because of the great irony that the Iroquois Nationals were prevented from traveling to represent their people in a sport they invented. I attempted to answer my research questions through a synthesis of various types of media. While journal articles and books were invaluable in situating the crisis in a historical and political context, the thrust of my research lay in piecing together a narrative of this past summer’s events, both by interviewing Nationals officials and by analyzing newspaper accounts from a variety of outlets. My conclusions were twofold; I found first and foremost that the lacrosse team’s efforts were merely the most recent example of what is a rich history of Iroquois resistance and attempts to maintain their identity. I also concluded that the governments involved had not deliberately dealt a blow to tribal sovereignty, but that the bureaucratic wrangling that marred the episode is inevitable in the wake of 9/11.

A COUNTY IN CRISIS: A CRITICAL ANALYSIS OF THE 1988 ROBESON COUNTY NEWSPAPER OFFICE HOSTAGE SITUATION

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Setting foot in Robeson County, North Carolina in 1988 was like stepping into the segregated South of the 1950s and 60s. Not only was there a tri-racial dynamic between the county’s African-Americans, Native Americans and the controlling, White minority, but there was also extreme corruption as well as drug trafficking imbedded in the county’s justice system, specifically the county Sheriff’s Department. In response to the discrimination and corruption, two Native Americans, Eddie Hatcher and Timothy Jacobs staged a hostage crisis at the Robesonian newspaper, demanding an investigation into Robeson County’s social, political and economic discrimination and corruption. This research analyzes the underlying tensions leading up to the crisis and offers an assessment of the aftermath down to the present day. Analysis begins by assessing the treatment of Native Americans in the community beginning in the late 1950s which created a ripe background for the 1988 hostage crisis. This research concludes that although immediately following the hostage taking, some steps were taken to address the issues, however, in the long term, not much has changed in Robeson County. Now a blip on North Carolina’s history, the Robesonian Newspaper crisis is not well known outside of the community. There is not much scholarly research on the topic. Thus, research methods included a trip to Robeson County and interviews with the only surviving hostage taker, Mr. Timothy Jacobs, and with Dr. Stanley Knick of Pembroke State University, an expert in Native Americans of Robeson County. Important primary sources also included dozens of newspaper accounts in the possession of Jacobs, as well as an 1989 honors thesis from the University of North Carolina at Chapel Hill, A Newspaper Held Hostage: A Case Study of Terrorism and the Media.

THE REALITY OF LIVIA’S POWER IN IMPERIAL ROME

Kelia Evans (Dr. Hui-Hua Chang) Department of History and Geography

In the ancient world, there are few women who stand out as prominent figures. One of the most prominent of these women is Livia, the wife of Emperor Augustus. My research was focused on the question: Did Livia have legitimate power in the Roman Empire? For the purposes of my research, legitimate power is defined as having significant control over multiple sectors of society. I was curious to discover if her perceived power by ancient and modern historians was legitimate, or whether she was made to look powerful as a propaganda tool of Augustus. This question is important in the topic of women in antiquity because Livia essentially set the standard for the Roman matrons of her era, and for the wives of emperors to follow. She is an extremely prominent figure in antiquity and women’s history. If, in fact, she did have legitimate power it would prove a huge stepping-stone for women in ancient society. There is much scholarly debate about this topic.
My research concluded that Livia did not, in fact, have legitimate power. In order to prove my point I had to take an approach that previous scholars had not: I had to compare Livia’s power in the context of her husband’s. This comparison was necessary because Augustus was arguably the most powerful person of his time, and it was important to see Livia’s extent of power as it coincided with his. I first addressed the reasons why Roman historians believed Livia to have power. My research focused on establishing Augustus’ power, and it quickly became clear that he essentially controlled almost every aspect of Roman society. He had control over the state’s military, religion, administration, and finances. I examined Livia’s amount of control in those same areas, and found that she really didn’t have any. I used the work of ancient historians Cassius and Suetonius, and archeological evidence such as coins to provide an ancient perspective. I also referenced the work over ten modern scholars on the subject.

“INDIANS LOVE BASEBALL, BUT WE DON’T SET UP CAMP IN THE BALLPARK”: THE CONTROVERSY OVER INDIAN MASCOTS IN COLLEGIATE SPORTS, AND THE CASE AT UNC-PEMBROKE

Hannah K. Gardner (Dr. Clyde Ellis) Department of History and Geography

There have been Indian mascots representing sports teams on college campuses quite literally since there have been Indians on college campuses. In 1894, the powerhouse football team that would later produce Jim Thorpe became known as the Carlisle Indians, from the Carlisle Indian School. Since then, the term “Indian”, tribal names, generic terms associated with Indians and even racial slurs have been employed as mascots representing sports teams across the country – but these mascots are rarely used by schools founded by or for Indians, as was the case at Carlisle. Thus, the controversy, dating back to the early 1960s, deals predominantly with members of Indian groups expressing their offense and outrage over the use of their traditions and symbols to promote non-native sports teams and franchises. However, the case at the University of North Carolina at Pembroke is an entirely different story. This study aimed to examine why UNC-Pembroke has remained immune to the mascot controversy, and to determine the implications of having an Indian mascot at a traditionally Indian school. UNC-Pembroke was founded in 1887 as a school to train Indian teachers; located in the heart of Robeson County, an area long-populated by members of the Lumbee Tribe of Indians, it has always maintained a dense Indian student population. And its sports teams, the UNC-Pembroke Braves, have traditionally benefitted from the support of the local Indian community. Through extensive background research into the controversy itself, as well as interviews with Pembroke faculty and the examination of primary documents such as student publications and the school’s newswire, it was concluded that the support of the tribe or nation in question is the dominant deciding factor in whether or not a school can realistically sponsor an Indian mascot. However, the social and emotional stakes are high when dealing with a controversy so deeply engrained in a culture of tradition, for both sides.

THE ROLE OF INTERNATIONAL HUMANITARIAN LAW IN THREE INTERNATIONAL CONFLICTS: WORLD WAR II, RWANDA, AND SRI LANKA

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For hundreds of years, humans have tried to codify a body of international law to govern the way that wars are fought and deal with transgressors in the aftermath of conflict. In the last half-century, the pace of this progress has accelerated exponentially, playing a number of different roles in various postconflict situations, but has still not kept pace with changes in world politics and styles of warfare. Using case studies in the Nuremberg and Rwandan Tribunals, this research examines the role of international humanitarian law (IHL) in Sri Lanka, a newly postconflict nation, within the wider context of the role that IHL – as opposed to or in cooperation with domestic forms of justice – should ideally play in such situations. Through the examination of such diverse cases as those listed above, the author is able to suggest broadly-applicable solutions to the most basic problem of IHL; that is, the inconsistency of its application, both within a single conflict (the losers are prosecuted, but not the winners), or on a global scale (great powers escape accountability while developing nations face prosecution).

The author’s research has focused on a variety of primary documents (such as the statutes for the various tribunals) and analytical secondary sources (articles on the outcomes of the Akayesu case in Rwanda, for example), from early international agreements (such as the Hague Conventions and Lieber Code) and
philosophical writings (such as those from Wolff or Grotius) to modern critiques (such as Seibert-Fohr’s critique of the International Criminal Court), case files (such as the judgment in the Media Trial of the Rwanda Tribunal), human rights reports (from groups like Amnesty International and Human Rights Watch), and news stories (mainly from the BBC and local sources). In addition, the writer spent the month of January 2011 conducting interviews with journalists, advocates, government figures, and representatives of the international community in and around Colombo, Sri Lanka, and plans to present their views within the appropriate historical and political context.

**THE DECLINE OF AFRICAN AMERICAN FARMERS IN THE AMERICAN SOUTH: THE ROLE OF THE LAND-GRA...**

Anna E. Powell (Dr. James Bissett) Department of History and Geography

Many historians have documented the fundamental changes in American agriculture that resulted in a precipitous decline in the number of family farmers since the 1920s, and no group has experienced this more profoundly than black farmers. This research attempts to explain the disproportionate burden felt by African American farmers in the changing American agricultural landscape by examining the role of “agrigovernment” the constellation of government agricultural agencies that emerged in the 1930s, in this process. The damage done to black farmers by federal agencies was documented by the U.S. Civil Rights Commission, the U.S. Census of Agriculture, and other watchdog groups that monitored USDA policy towards African Americans, and this study makes use of those findings. In addition, the research explores whether the structure and policies of federal agricultural agencies including the land-grant college system, the cooperative extension service and the United States Department of Agriculture’s Farm Service Agency. This study concludes that not only was discrimination present in federal agricultural policy, but that the discriminatory policies of all of these institutions account for the rapid decline of black farmers in the Southeast United States.

**FROM BETTY TO PEGGY AND EVERYWOMAN IN BETWEEN: THE SHIFT FROM HOUSEWIFE TO CAREER WOMAN IN THREE LEADING WOMEN’S MAGAZINES, 1963-1978**

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What would June Cleaver ever think? As the housewife protagonist of the famous Leave it to Beaver television series from 1957-63, could she have imagined how the world of women and work would inexorably change within a scant fifteen years? The 1960s and 70s saw the onset of second-wave feminism and the Women’s Liberation Movement, with one of the goals of these movements being to increase women’s presence in the professional workplace. This project analyzed 144 issues between 1963-1978 of women’s magazines Redbook, Ladies’ Home Journal, and Mademoiselle to gain insight into one major aspect of society’s responses to this changing cultural paradigm, from the housewife ideal to the career woman. Did the magazines’ editors, writers, and readers welcome this transformative shift? These women’s magazines were chosen for evaluation because advertisements, editorialis, and articles of women’s magazines “result from a series of negotiations with other cultural forces…the magazines’ interactions with other facets of American culture…make them revealing as cultural artifacts (Walker, 2000, p. x).”

Previous research on women’s magazines has focused largely on advertisements and the culture of domesticity and the role of the magazine in preserving or challenging women’s prescribed societal roles. The 144 issues of the magazines were selected on a rotating yearly-month schedule so as to not exhibit bias and examined using microfilm collections or bound-book collections at regional university libraries. Overall, there was support and surprises amongst all three magazines, though at different levels throughout the years and in different manners. Redbook took on a theoretical approach to the matter in early years, which transformed into a “role-model” solution later on. Ladies’ Home Journal’s level of support depended heavily on its editor, with a philosophical approach shifting into financial advice upon a change in editorship. Lastly, Mademoiselle emphasized the personal satisfactions of working for women as well as featuring a variety of careers, akin to the “role-model” approach seen in Redbook.
WHY WERE THE PUNISHMENTS FOR ADULTERY SO SEVERE IN CLASSICAL ATHENS?

Marissa R. Semon (Dr. Hui-Hua Chang) Department of History and Geography

One of the few surviving Athenian court cases, Lysias’ On the Murder of Eratosthenes, dated around 400 BC, documents the defense of Euphiletus who killed his wife’s lover after catching them in an affair. Although the defendant in the case explains why the law makers considered adultery a more serious offense than rape, and that he killed his wife’s lover because the law allowed him that right, the document lacks specificity as to the complexity of this offense and its consequences on the daily life of a family in democratic Athens. The goal of this study is to investigate how social, economic, and political reasons influenced the severity of the punishments for adultery. Since elite men were typically the primary authors of ancient sources, there usually is bias in the way they examined the lives of women in their society. This research is significant because it places the examination of gender roles and gender relations in a broader social and economic context, and addresses citizen women’s fundamental importance to the preservation of wealth and citizenship in Classical Athens. My research will use the court case On the Murder of Eratosthenes as starting point to explore the Athenian concept of adultery and rape. I then address the expected role for citizen women in Athenian society and their importance to citizenship and inheritance. I also focus on the purpose of marriage and explore why women and men would want to commit adultery, as well as how men feared women’s use of their sexuality as emotional outlets. Due to the fact that legitimacy of children was crucial to the identity of true citizens, who held all political power in Athens, punishments for adultery were so harsh in order to deter a man or woman from actually committing the crime. My primary sources include Athenian court documents or writings by Lysias, Apollodorus, and Aristotle. I also use modern scholars’ studies, like David Cohen and Eva Cantarella’s studies to examine Athenian law. Other modern work I used focused on information concerning Athenian marriage practices such as studies by Marilyn Skinner, Giulia Sissa, and Susan Squire.

THAT “WILD AND FANATICAL SPIRIT”: CONTROLLING THE SLAVERY DEBATE AMONGST KENTUCKY EVANGELICALS

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White Kentuckian evangelicals participated in local, regional, and national debates over slavery, arguing amongst themselves and with outsiders over the future of the institution. Scholars have studied many of these debates, but they have not paid sufficient attention to the way that the institutional settings in which the debates took place changed over time. For example, white Kentuckian evangelicals could only discuss slavery in individual congregations during the early years of settlement (1780s-1810s) because they had not established larger denominational organizations strong enough to withstand debates over controversial questions. By the 1830s, white Kentuckians had established lively religious institutions, but proslavery evangelicals were still hesitant to allow debate over slavery in them; one way in which proslavery whites continued to limit discussion of the “peculiar institution” was to restrict black evangelicals’ roles in denominational councils. This project engages existing explanations of the changing nature of proslavery, the search for a middle ground on slavery in Kentucky, and Southern churches’ support for slavery and explains why, how, and with what consequences the venues in which white Kentuckians debated slavery changed over time. I agree with recent scholars such as Luke Harlow who argue that white Kentuckians failed to choose sides in the slavery debate and ultimately united around a gradual emancipationist approach to slavery. However, I argue that it was more than geography and propaganda that fostered this middle-of-the-road approach. Rather, proslavery white evangelicals were able to maintain procedural control of the most influential organizations in Kentucky, including the civil government, and effectively quarantined antislavery sentiments to smaller venues with no legislative power, such as benevolent societies and individual congregations. Since antislavery supporters could not gain any ground in large jurisdiction which had real policymaking potential, Kentuckians were stuck in the middle, supporting slaveholders’ rights while calling for an eventual end to the institution of slavery. The research relies on church and association minutes, membership rolls, census information, personal papers, and newspaper articles.
THE REAL SPARTAN MILITARY

Megan E. Wynn (Dr. Hui-Hua Chang) Department of History

Sparta’s military-structured society has generated much debate about the superiority of the Spartan military and the uniqueness of its ideology. This study investigated the accuracy of the Spartan image as it has been handed down to the Western world. Whereas other scholarship in this field either focuses on the general hoplite soldier, or on the Spartan warrior in particular, this research conducted a detailed comparison between the two in an effort to discover what made the Spartans stand apart from other Greek armies. The essential question posed by this research is: How truly unique was the Spartan military from other Greek armies? It is important to address this question because the Spartans have been represented in many forms of discourse that have influenced the Western world’s opinion about Classical Greece. For instance, anybody who has ever seen the film 300 would immediately consider Sparta to be a god among fighting forces, a unit that functioned significantly differently from other Greek armies. It would be most beneficial to have an accurate understanding of how the Spartan society functioned, since it is this society that stands out to historians of the ancient world.

This study analyzed specific aspects that set the Spartans apart from other Greek fighting forces, including the community life, the role of women, Spartan education, training of young soldiers, equipment used in battle, and professionalism on the battlefield. It found that although the armies of Classical Greece were certainly not amateurs when it came to warfare, the Spartan hoplite took their military responsibility to a higher level of excellence due to the fact that soldiery was not just a side-job for the citizen of Sparta; it was his life.

Research utilized the writings of Herodotus, Plutarch, and Xenophon as primary sources for information regarding the lifestyle of Spartans. Many secondary sources were also employed, including the noteworthy works of Sarah Pomeroy, who specializes in Spartan women, and Paul Cartledge, who focuses specifically on the Spartan military.

THE INFLUENCE OF MEMORY ON THE RETURNED EXILE EXPERIENCE IN POST-DICTATORSHIP CHILE

Renee K. Zale (Dr. Michael Matthews) Department of History

On September 11, 1973 a military coup placed Augusto Pinochet in power in Chile, resulting in almost seventeen years of military rule and the death of Salvador Allende, the democratically elected socialist president of Chile. During the years of repression and massive human rights violations that followed, thousands of Chileans fled the country in exile to locations such as Argentina, the United States, and Europe. In the case of political exiles, the Pinochet regime promoted an image of a luxurious exile, in which exiles abandoned their country and their comrades to live in wealthy areas such as Europe. This project investigates the manner in which memory influences human rights discourse and policies in Chile today, through the examination of the returned Chilean exile community. It features a number of interviews with returned Chilean exiles regarding their escape from Chile, life in exile, and the process of return. Other interviews feature Chilean human rights experts about their work during the dictatorship and today, as well as the state of justice, reparations and memory in Chile. Through the use of influential memory theories from scholars such as Pierre Nora and Steve Stern, as well information attained through interviews, this project analyzes the collective memory of exile within Chile. Furthermore, this investigation examines the manner in which the collective memory of exile influences reparations policies and interactions between human rights groups. This project concludes that the memory of the Pinochet dictatorship is extremely divided in Chile, and these divisions reflect in Chilean attitudes regarding human rights and politics today.
HUMAN SERVICES STUDIES

THE WAKE COUNTY STUDENT ASSIGNMENT POLICY: THE POLITICS AND CONSEQUENCES OF SNUBBING THE PUBLIC

Virginia A. Fischer (Dr. Beth E. Warner) Department of Human Service Studies

For almost ten years, The Wake County Public School System (WCPSS) has assigned students to schools using Policy 6200, which takes the student’s socioeconomic status into account in the assignment. This policy ensures that no school has greater than 40% of its students eligible for the free or reduced price lunch plan, and in doing so ensures that no school faces the challenges and obstacles associated with educating many low-income students at once. However, last fall four new members were elected to the Wake County School Board, and last March the board voted 5-4 to end the “diversity policy,” and begin assigning students to “community schools,” or the school closest to their homes. This research examines how the story of Wake County’s Policy 6200 can inform others interested in school reform about the challenges associated with equitable school assignment which pays attention to the research on children’s learning outcomes. Using grounded theory, the researcher conducted interviews with parents, teachers, former students, and community members to determine the perspectives of key players. The researcher then analyzed the content of both these interviews and secondary data, including court rulings, North Carolina EOG data, demographics, newspaper articles, and transcripts from school board meetings. From this analysis, researchers have determined some key findings that can guide future reform efforts in other school districts similar to Wake County. Conclusions are drawn about the consequences of apathy among voters, the polarization that results when governing leaders are disconnected from their constituents, the role that the media plays in driving reform efforts, and the results when, as one interview participant said, “the silent majority is caught asleep at the wheel.”

“IT WAS REALLY COOL BECAUSE WE COULD SHARE OUR STORIES”: ASSESSING THE IMPACT OF A CREATIVE WRITING GROUP FOR YOUTH LIVING WITH HIV

Emily A. Wise (Dr. Cynthia Fair) Department of Human Service Studies

Adolescents who have HIV infection represent an important subgroup of the overall population of individuals living with the illness. HIV-infected teens experience significantly more medical, social, and psychological challenges than their healthy peers, and frequently lack resources with which to cope with these problems. This project explored the impact of a creative writing group on youth living with HIV. The primary goals of the group were to create a safe haven for expression of feelings related to being a teenager and living with HIV as well as to reduce isolation. By conducting interviews with HIV-positive teenagers, their parents/guardians, and group leaders, we explored the potential impact of a creative writing therapy group on teenagers living with perinatally acquired HIV infection. A total of 12 participants were interviewed after the conclusion of the group including five adolescents with HIV (mean age 14.8 years), four parents/guardians, and three group leaders. Following the traditions of qualitative analyses, interviews were transcribed and coded by two independent readers. Themes were identified through a process of open coding and consensus was reached on all final themes. Qualitative analyses of the interviews indicated that group members experienced increased confidence, better communication skills, and a deeper understanding of their illness. Isolation was also reduced during the time of the group. However, group participants did not continue to have contact with each other once the group was over, thereby limiting the scope of the group impact. These results suggest that creative writing groups can be beneficial for adolescents living with HIV. Future clinical work should focus on mechanisms to extend the group benefit of decreased isolation once the intervention has ended.
"THE PEDIATRIC SOCIAL WORKER REALLY SHEPHERDS THEM THROUGH THE PROCESS": CARE TEAM MEMBER ROLES IN TRANSITIONING ADOLESCENTS WITH HIV TO ADULT CARE

Alexandra P. Lawrence (Dr. Cynthia Fair) Department of Human Service Studies

Rates of HIV infection among adolescents in the U.S. continue to rise, resulting in more individuals who must eventually transition from pediatric to adult infectious disease care. It is critical that this process go smoothly to ensure continuity of care and to maximize patient outcomes. Previous research has examined youths’ experiences with the transition process as well as practitioners’ definitions of best practices for transition. However, little research has examined the roles of the care team members in the transition process, particularly those of pediatric and adult social workers. Role clarification is necessary to optimize team functioning and ensure quality patient care. Interviews were conducted with 19 professionals who provide care for youth with HIV in a southeastern state in the U.S. Approximately half of the participants were pediatric practitioners. Nine of those interviewed were medical providers and ten were social workers. Participants had been working in the field of HIV for an average of 11.2 years. Interviews were taped, transcribed, and coded for emergent themes. There was general consensus that pediatric social workers played a key and pivotal role in the transition process. Pediatric social workers reinforced medical providers’ messages and helped interpret complicated medical language. The role of pediatric and adult social workers also included accessing community resources and preparing patients for their first visit to the adult clinic. Pediatric medical providers were responsible for conveying medical information to the patient, his/her family, and the adult medical provider. Findings also indicated that primary roles of adult medical providers included helping the newly transition patient feel comfortable in the adult clinic, as well as taking a new medical and sexual history.

INTERNATIONAL STUDIES

IKHWAN AL-MUSLIMIN: THEIR STRATEGIC NARRATIVE AND ITS METAMORPHISIS OVER TIME

Kelsey L. Glover (Dr. Laura Roselle) Department of International Studies

What factors affect the carefully crafted message of an Islamic organization that has maintained its popularity and even expanded while surviving three despotic regimes and a corrupt monarchy? That is precisely what my research aims to discern through an in-depth qualitative analysis of the strategic narrative of the Ikwan al-Muslimin, also known as the Muslim Brotherhood of Egypt. The Ikhwan are a politically active Islamic organization who have been a formidable player on the political scene as one of the only opposition groups for over eighty years. Given the recent revolution in Egypt, they could have a dramatic impact on the future of the country, and it becomes even more important to understand their message and how it has changed over time. In order to analyze said narratives in a systematic manner, I developed a coding instrument to compare the organization’s narratives at important points in history when the factors that affect group narratives - such as social dissatisfaction, type of government and political crisis - changed. The particular dates are: 1928, 1954, 1981, and 2005. The coding instrument addresses themes and descriptions of grievances and remedies. I am analyzing these narratives to look for reactionary changes and trends over time. My research suggests that there have been changes. This research is timely and relevant – as Egypt builds a new political system; thus this work helps not only to understand the Muslim Brotherhood’s past but help the world understand them in future.
EVALUATING THE SUCCESS OF RURAL EDUCATION INITIATIVES AND DEVELOPMENT PROJECTS - SOKODE, GHANA: A CASE STUDY

Katherine E. Lampe (Dr. Brian Digre), Department of International Studies

Although Ghana is widely recognized for its democracy and the successful progress of its developing free market economy, the country continues to face many challenges in the areas of education, health, rural development, and poverty reduction. Among scholars and development experts there is strong support for the use of grassroots, community-based projects to address these problems. However, further local studies are needed to examine this belief while identifying valuable projects and strategies. This research explores the diverse challenges facing Western African communities in the realms of education and development and the various ways they have chosen to address them, focusing specifically on the success of these initiatives. The study further examines the role of external aid to promote rural, small-scale development projects.

The community of Sokode, in Ghana’s Volta Region, serves as a valuable case study to assess the success of specific projects such as school construction, scholarships for post-secondary education, Heifer International livestock development, Full Belly Universal Nut Shellers (peanut-shelling machines), Solar Cookers International solar ovens, mosquito bed net distribution and use, and Peace Corps teaching. Background research was conducted through secondary sources such as books and scholarly journal articles, and personal interviews completed in Sokode over a two-week period in January 2011 provided a wealth of primary sources. The information gleaned from this research revealed many significant challenges that the community faces both in the realms of education and community development, most of which ultimately stem from the widespread poverty in the area. While some projects that have been undertaken were shown to have been successful, others did not meet their proposed objectives. The study further highlighted additional areas where the community struggles to meet their needs. Understanding these issues and the most effective methods to promote community development will offer insights for designing poverty reduction strategies in Sokode and possibly in other areas of Ghana and West Africa as well.

GLITTER OR GLOOM?: NATURAL RESOURCE EXTRACTION AND COMMUNITY STANDARDS IN GHANA

Natalie P. Lampert (Dr. Bud Warner), Department of International Studies

Over sixty percent of the world’s poorest people live in nations rich in natural resources (Ross, 2001) but they rarely share in the wealth. Natural resource wealth does not often equate to higher standards of living for individuals living in resource-rich developing countries; instead, highly invasive extraction projects often have negative socio-economic impacts on these communities. This project explores how local and global awareness of mining activities, transparency in mining legislation, and community empowerment play a significant role in whether or not extractive industries do and can positively impact poor mining communities.

Field research was conducted in and around the mining communities of Prestea, Ghana in the spring of 2010. Data and personal narratives collected in Ghana were analyzed to explore the perspectives and socio-economic impacts of gold mining in Ghana in relation to how natural resource extraction affects under-developed communities. Key themes include issues of local versus governmental responsibility in enforcing positive mining practices, community empowerment, and a lack of awareness of negative and unjust socio-economic repercussions of extractive projects.

Presented in a creative, investigative-journalistic fashion using narrative inquiry analysis, the data and narratives illustrate the complexity of perspectives surrounding current natural resource extraction projects and the resulting irresponsible mining practices. This research project has culminated in a working research paper and a photography-based multimedia and oral presentation. Identified themes are further explored within existing theories of socio-economic justice to draw and discuss conclusions on understanding if and how extractive industries can positively impact the communities in which they operate.
THE IMPACT OF INTERNATIONAL AND DOMESTIC FACTORS ON THE SUCCESS OF THE ZAPATISTA MOVEMENT IN CHIAPAS, MEXICO

Jacy L. Lance (Dr. Donna Van Bodegraven) Department of Foreign Languages

On January 1, 1994, the same day that NAFTA was signed into law by the United States, Mexico and Canada, the Zapatista Army of National Liberation (EZLN, Ejército Zapatista de Liberación Nacional) brought a list of demands to Mexican society, to the people and governments of the world and to the national and international press. These demands included, but were not limited to, an end to illiteracy in indigenous communities, free and democratic elections, and the construction of hospitals and housing in all rural communities and municipal seats. This research project evaluates whether the Mexican government has met any of these demands and whether the Zapatistas have been successful in raising the standard of living among the indigenous in Chiapas. The standard of living and progress made in Chiapas is measured by comparing Mexican census data from before the 1994 uprising to more current information. In addition to comparing the progress made specifically in Chiapas, data from another indigenous Mexican state, an economically prosperous Mexican state, and the United Mexican States as a whole is used to provide a framework for the results. Ultimately, the fulfillment of Zapatista goals has been inhibited by barriers such as endemic corruption within the Mexican government, the existence of paramilitary groups that act with impunity and a high level of international involvement by the United States in support of the Mexican government. This research project is significant because it explores how effective the anti-Zapatista efforts have been in preventing the successful achievement of Zapatista demands. Moreover, the study analyzes the impact of international involvement in the conflict between the Mexican government and the Zapatistas, focusing specifically on the roles of the United States and Canada.

LEADERSHIP STUDIES

THE IMPACT OF THE ELON EXPERIENCES ON STUDENT GROWTH OUTCOMES

Lauren K. Flood and Anna L. Hulett (Dr. Christopher Leupold) Departments of Leadership Studies and Psychology

Elon University’s mission statement closely reflects the values inherent in the Multi-Institutional Study of Leadership (MSL), as both emphasize the importance of college student experiences and growth to a well-rounded and complete education. Included in Elon’s mission statement is a desire to prepare students to be informed leaders, global citizens, and focused on the common good. The five Elon experiences enable students to put theory into practice by requiring each student to participate in at least one of the following: leadership development, service learning, internships/co-ops, study abroad/intercultural experiences, or undergraduate research. These experiences coexist with the Elon University mission statement to nurture the development of informed and socially responsible future leaders.

The MSL is an annual nationwide survey of leadership development and student engagement, and is open to and completed by every type of university in the United States. The 2009 study produced a final sample of over 92,000 students representing 101 colleges and universities (Komives, Dugan, Owen, 2009, p. 12). Founded on the principles of the Social Change Model (HERI, 1996), the MSL provides an opportunity for participating institutions to understand environmental factors that contribute to the success of student development and obtain a benchmark to compare results to other participating institutions (Komives, et al., 2009, p.12).

The current study examined the impact of each of the Elon Experiences on an array of important outcome measures, including Social Change Behaviors, Cognitive Complexity, Social Perspective Taking, Leader Self Efficacy, and eight separate dimensions related to the Social Change Model (e.g., resolving conflict with civility, commitment, etc.). Based on the results of the of 1,931 Elon students who completed the survey, it appears that the Elon Experiences do indeed have a significantly positive impact on all criteria. Results do indicate slightly different outcome patterns by experience; these, as well as implications of the findings will be discussed.
MANAGEMENT

AN INVESTIGATION OF THE EFFECTIVENESS OF EXTENSIVE SUSTAINABILITY STRATEGIES ON THE WORLD’S LARGEST HOTEL GROUPS

Jennifer A. Kirts (Dr. Susan L. Manring and Dr. Betsy Stevens) Department of Management

The sustainability trend has recently evolved into a necessity, with companies around the world considering the environment to be one of their most important stakeholders. Several of the world’s largest hotel groups have taken it upon themselves to implement “sustainability strategies” in which they issue environmental mission statements, sustainability reports, green “scorecards”, and more. Some hotel groups are investing millions in implementing and advertising their sustainable strategies, while others are choosing to take a more conservative approach. Research argues that “going green” attracts socially conscious consumers, but is implementing extensive sustainability strategies actually financially beneficial for large hotel groups? Understanding the effectiveness of sustainability strategies for large hotel groups allows companies to make investment decisions in regards to environmental policies. We know that switching to “eco-friendly” solutions may result in lower operational costs to the hotel, but at the expense of large initial investments that many companies cannot justify. If socially conscious consumers have a large stake in the hospitality industry, it may urge larger hotel groups to move ahead with the sustainability policies because they would likely see a faster return on their investment with the increase in consumer base. This research investigates the effectiveness of sustainability policies in two ways. It first examines the top ten largest hotel groups by analyzing their sustainability policies based on a variety of factors including size, publications/awareness, implementation, and more. The companies are then compared financially to one another and analyzed with consideration to their environmental investments. Secondly, a survey was conducted in which consumers rate the importance of sustainability strategies in their choosing of a hotel. Initial analysis suggests that the financial investment hotel groups make in sustainability policies presents more long-term financial benefits than short-term. While consumers generally believe themselves to be “environmentally aware,” few actually consider the hotel’s sustainability strategy a deciding factor over price, location, and quality. Overall, hotel groups that are able to make the investment in sustainability strategies today may be much better off in the future as younger generations enter the workforce and make the assumption that the hospitality industry will accommodate their “eco-friendly” expectations.

MARKETING

THE IMPACT OF EMERGING MEDIUMS FOR CUSTOMER SERVICE DELIVERY IN ONLINE PURCHASING: A STUDY OF CUSTOMER SATISFACTION AND LOYALTY AMONG COLLEGE STUDENTS

Danica A. Shipley (Dr. Sharon Hodge) Department of Marketing

This study assesses whether click to call or click to chat is more effective for delivering customer service to college students during online purchasing. Strong customer service is key to business success because it influences choice of retailers and service providers and strongly impacts customer satisfaction and loyalty. Using customer service mediums appropriate for the target market is important because the medium used affects perceptions of service quality. Click to chat is generally preferred by younger generations. It is used more during the early stages of purchasing and when information sought is more basic. College students who are part of the Millennial Generation (aged 18 to 29) use the Internet more than any of their predecessors, and make frequent use of online instant messaging. Understanding how best to connect with this large (50 million in US), tech-savvy generation is critical for success in the growing online retail market. Providing customer service in line with the behaviors of college students can turn browsers into purchasers, build customer loyalty, and create positive consumer attitude. Research examining the impact of click to chat and click to call on customer service effectiveness is very limited; no research has addressed their effectiveness at meeting the needs of college consumers while shopping online. In this respect, this project is unique and adds to knowledge
development in marketing. Preliminary qualitative research was conducted via four focus groups, two with click to chat users and two with non-users. Quantitative data was gathered through an experiment in which participants were given a purchasing scenario asking them to configure a laptop with the help of either a click to call or click to chat customer service agent. After configuration, participants were surveyed to evaluate customer service effectiveness, levels of satisfaction, purchase intention, and attitude and loyalty toward the company/brand. While the researcher hypothesizes that click to chat will be the more effective medium, data analysis is in the beginning stages so conclusions have not yet been drawn.

**MATHEMATICS**

**DIFFERENTIAL EQUATION MODEL FOR MALARIA ENDEMIC POPULATIONS**

Gregory C. Mader (Dr. Karen Yokley) Department of Mathematics and Statistics

Malaria is a serious and complex disease, causing between 350 and 500 million diagnosed cases and approximately one million deaths every year in sub-Saharan Africa. Previous research was conducted to create an agent-based simulation that matched a latency-extended Ross-MacDonald model for malaria endemic populations. The agent-based simulation was then extended to incorporate acquired immunity in human subpopulations. The current study explores two approaches for including immunity in the Ross-MacDonald model, and the results of the enhanced differential system are compared to the behaviors and population distributions observed in the extended agent-based simulation. The piecewise continuous approach for immunity helped capture some of the basic features of the agent-based simulation, but by including acquired immunity in a completely continuous manner, the model exhibited more of the intricacies and complexities witnessed in the stochastic simulation.

**MUSIC**

**THE EFFECTS OF LEARNING JAZZ IMPROVISATION ON STUDENT PERFORMANCE IN SECOND LANGUAGE ACQUISITION**

Kaitlyn Anne Fay (Dr. Matthew Buckmaster) Department of Music

Jazz education in the classroom setting is a widely discussed topic within the music education community (Whyton, 2006). Many jazz educators believe that learning to improvise is similar to learning a second language (Velleman, 1978). In fact, skills involved in learning improvisation are closely related to those involved in second language learning (Dobbins, 1980; Velleman, 1978). Listening, building a vocabulary, and practicing the language are crucial steps in learning both improvisation and a second language (Mackenzie, 2000; Velleman, 1978). This research focused on the skills used in learning jazz improvisation and a second language and how concurrent study could potentially affect students’ skills and progress.

The study utilized a mixed methods comparative case study design with two 7th grade participants who were concurrently enrolled in jazz band and a Spanish language class. Pre- and post-tests in both areas were administered. Over 8 weeks the students participated in 13 half-hour workshops on jazz improvisation. To enrich the data set interviews were conducted with the students and Spanish teacher. A panel of experts in the fields of Spanish language and jazz evaluated the speaking and playing pre- and post-tests. The quantitative data illustrates improvement of students’ skills while qualitative data yielded supporting anecdotal evidence. This could point toward potential connections between learning improvisation and second language acquisition. It is hoped that further research in this area will further examine the possible benefits of learning to spontaneously create music for all students and the importance of including and emphasizing improvisation in the curriculum.
MUSICAL ATTITUDES IN PRE-SOVIET RUSSIA: GLAZUNOV AND THE SAXOPHONE

Jonathan B. Moore (Dr. Victoria Fischer Faw) Department of Music

To many Russian composers of the mid-19th to mid-20th century, struggling to define a musical paradigm simultaneously equivalent to yet distinct from the West, the saxophone grew from a new and useful instrument for military bands to be a representation of both the urbane yet bourgeois France and the radical, almost heretical, jazz of the US. To the Russian composer Aleksandr Glazunov, however, who settled in Paris on a self imposed exile from Russia from 1921 until his death in 1936, the saxophone represented a freedom both from the ever-growing political influence of the Soviets and from the imposing creative influence of Russian music critics, whose “nationalist” polemics had far pre-dated Soviet control.

Building on the arguments by Russian musicologist Marina Frolova-Walker, which in part assert that the critical milieu in Russian music during this time period was one of merely superficial nationalism, the aim of this study has been to illuminate, through the reception history of Glazunov and his brief relationship with the saxophone, motivations behind the attitudes and writings of pre- and early Soviet musical critics which, though ostensibly practical, belie politics which precursed Soviet propagandizing. To summarize: What can the reception history of Glazunov and the saxophone reveal to us about the ease in which purely Soviet ideas co-opted Russian musical thought?

Through a survey of surviving contemporary journalistic writings of Russian critics and composers, secondary texts which examine both the political and musical history of Russia, and through theoretical analyses of contemporary scores, this study has determined that the concept of Soviet propagandizing does not exist as an anomalous behavior in the realm of Russian musical critique, but is rather merely the most apparent application of a Russian political-critical predilection towards revisionism at the expense of the theoretical cohesiveness of a supposed “Russian School” of composition as made apparent utilizing Aleksandr Glazunov as a lens. This conclusion runs counter to the historical descriptor of Russian music as necessarily “nationalistic,” and necessitates that this monolithic label be accurately recognized as an artificial critical construction formulated irrespective of the practices and concerns of many Russian pre-Soviet composers.

PHYSICS

PRODUCTION OF MAGNETIC MICROSPHERES FOR HYPERTERMIA TREATMENT OF TUMORS

Alison E Deatsch (Dr. Benjamin Evans) Department of Physics

Magnetic microspheres are used in a wide variety of applications within the scientific community – they are useful, for example, in delivering drugs to specific areas of the body with the use of a magnet. Current literature suggests that this would be a highly effective (and much less toxic) method for treatments such as chemotherapy and radiation. It could also present a possibility for targeted hyperthermia, as an alternative for or supplement to radiation treatments. There is therefore a demand for the production of magnetic microspheres of particular size and chemical makeup, as well as a demand for the demonstration of the ability of microspheres to increase in temperature without having to heat all the surrounding cells. The goals of my research were to produce magnetic microspheres of a narrow size distribution with the use of a novel nanoparticle / polymer composite material and to demonstrate the ability to heat these microspheres upon stimulation with an external electric field, without heating the surrounding environment. To accomplish my goals, I refined current methods to produce a magnetic microsphere that could be reliably fabricated in sizes within the critical 0.5 – 2 micron gap in the current range of similar, commercially-available particles. In this method, I produce a colloidal suspension of liquid nanoparticle / polymer composite material in a surfactant solution and crosslink the resultant spheres. I have then demonstrated that these magnetic microspheres can be heated with a radio-frequency oscillating magnetic field and have quantified the temperature rise upon stimulation by the magnetic field. This heating mechanism is significant because it can be performed on microspheres in vivo without heating the remainder of the body.
OPTIMIZATION OF A NOVEL MATERIAL FOR APPLICATION IN MAGNETIC MICROACTUATORS

Willem J Prins (Dr. Benjamin Evans) Department of Physics

Microactuators are microscale devices which can be manipulated to produce motion at the microscale. We have a novel magnetic-nanoparticle / polymer composite, which is an ideal material for the production of monolithic microactuators, such as biomimetic cilia. The iron content allows magnetic control while the polymer lends flexibility; however, the very iron which makes the material magnetically controllable also makes it less flexible.

My research is to optimize the material for maximum bendability by varying the iron concentration. To accomplish this, I built a device which uses a micrometer to compress our samples against a force probe which in return allows us to determine the Youngs Modulus, which is a measure of the flexibility of the material. Combining these measurements with measurements of the magnetization of the material, we can calculate the magnetoelastic ratio, which quantifies how well the polymer composite will bend in a magnetic field. We show that our predictions of this magneto-elastic ratio correlate well with the ratios measured in microactuator bending experiments previously completed in the lab.

TEMPERATURE-DEPENDENT RELEASE OF A MODEL DRUG FROM FERROELASTOMERIC MICROSPHERES FOR THE PURPOSE OF TARGETED DRUG DELIVERY

Julie C. Ronecker (Dr. Benjamin A. Evans) Department of Physics

As an alternative to surgical resection and radiation, magnetic drug delivery is a viable method utilized to target and control the spread of malignant cells in the body. In a typical implementation, nano-scale magnetic particles would adsorb a drug and then be directed via external magnetic fields to specific regions of the body (Meyer et al., 2001). We present in this work a novel polymeric magnetic microsphere composed of iron oxide nanoparticles that are complexed with poly(dimethyl siloxane). These spheres can absorb a drug throughout their volume, leading to a greater carrying capacity; in addition, their unique hydrophobicity may make them particularly suited for transporting lipophilic pharmaceuticals. We demonstrate the ability of these new microspheres to absorb rhodamine dye as a drug model and use UV-VIS spectroscopy to quantify the amount of rhodamine released from the microspheres over time.

Anticipating in-vivo heating of the microspheres via radio-frequency magnetic stimulation, we measure the drug concentration leached (g/L of rhodamine) over a period of two hours at room temperature and across a range of physiologically-relevant temperatures: 20°C, 25°C, 37°C (body temperature), 40°C, 43°C, 46°C, and 49°C. We show that the rate of drug release increases with temperature, suggesting magnetic heating as a mechanism for triggering drug release in a targeted system.

USING NASA’S SUZAKU X-RAY OBSERVATORY TO STUDY BLACK-HOLE ACCRETION IN THE RADIO-LOUD GALAXY NGC 6251

Aaron Summers (Dr. Dan A. Evans) Department of Physics

The extremely luminous output of Active Galactic Nuclei is generated by accretion onto a supermassive black hole, with a mass between a million and a billion times that of our Sun. Such phenomena have the power to shape the largest structures in the Universe, and so necessitate a detailed understanding. NASA’s Suzaku X-ray Observatory offers a powerful method to analyze the characteristics of supermassive black holes. Here, we present a detailed spectroscopic analysis of the nearby galaxy NGC 6251, which hosts a black hole of 6x10^8 solar masses. We use Suzaku to infer how material falls onto the black hole, as well as to constrain its spin. Our observations confirm that there are no signatures of accretion-related X-ray emission in NGC 6251, and we provide strong upper limits to the presence of (1) the 6.4 keV Fe Kα line, (2) heavily absorbed X-ray emission, and (3) the Compton reflection hump. We discuss our results in the context of the interplay between inflow and outflow in AGN, and conclude that NGC 6251 does not fit into conventional models of black hole phenomenology.
POLITICAL SCIENCE AND PUBLIC ADMINISTRATION

RHETORICAL BATTLEFIELDS: EXAMINING THE DIALECTICAL COMPONENTS OF ISLAMIC INTRA-SECTARIAN CONFLICT AND COMPETITION IN POST-BA’ATHIST IRAQ

Andrew T. Black (Dr. Michael Pregill) Department of Political Science and Public Administration

Literature on the communication of resistance, revolution, and collective action and the mobilization of opposition against a singular, constructed enemy is as diverse as it is profuse. Scholars have emphasized such variables as ideation and the communication/creation of identity (Yee, 1996), social networking (Wickham, 2002), and the constitution of authority (Lincoln, 1994). Others have sought to examine the strategic use of media, such as the role of mainstream media (Gamson and Wolfsfeld, 1993), the exploitation of dramatic action and violence (Bloom, 2005), the utilization of specific communicative resources (Bunt, 2009), and technological innovation and new media more generally (Jenkins, 2006). There is an absence of research, however, on the rhetorical and media strategies by which competing opposition movements vie for the authority to represent an emergent counter-culture or counter-government, or, more simply, how exceedingly similar yet rival groups effectively differentiate themselves. This study develops an understanding of communication between similar yet competing groups via a corpus linguistic analysis of media propagated from two Sunni organizations and two Shi’ite organizations operating in Iraq between 2005 and 2008. These movements represent Sunni and Shi’ite interests respectively, but nevertheless compete for authority on a local, national, and/or transnational level. Videos, manuscripts, pamphlets, and artwork from the databases of SITE Intelligence Group are examined utilizing rhetorical analysis and coded for the use of frames that exemplify the constitution of authority over a rival group or allegiance to either indigenous/local objectives or Islamic universal or transnational (or supranational) objectives. The conclusions of this research illuminate insurgent recruitment and growth in the face of competition within the same constituency, reveal the manner in which rival groups interact within a conflict zone, and place the politics of intra-sectarian conflict at the center of analysis (representing a break from pre-war literature, which overwhelmingly fixates on the politics of inter-sectarian, or Sunni vs. Shi’a conflict).

POVERTY AND ENVIRONMENTAL STRESS: AFRICA IN THE POST-MILLENNIUM DEVELOPMENT GOAL ERA

Taylor N. Foshee (Dr. Sharon Spray) Department of Political Science

The challenges to lower rates of poverty while promoting sustainable development are two of the most pressing issues facing developing countries today. In 2000, the United Nations adopted the Millennium Declaration representing the vision for a common future defined by the achievement of a world with reduced poverty and a healthier environment through global partnerships. Since the implementation of the Millennium Declaration, Sub-Saharan Africa has seen the least success in the achievement of these goals. In the first five years, between 2000 and 2005, the number of poor people rose from 296 million to 388 million in the region and the World Bank concluded that the Sub-Saharan region is the only region remaining significantly off track from achieving the poverty reduction. While economic conditions have been thought to be the primary factor influencing this success, emerging research suggests other factors at the national level may be playing an equally integral role.

This study explores the relative successes and failures to alleviate poverty and environmental stress across nine sub-Saharan African nations and the implications of socio-political variables including conflict and governance. Employing interdisciplinary research across the fields of political ecology and international relations, the study evaluates poverty and environmental degradation using a multi-variable case-based methodology. Focusing on the relationship between rates of poverty and rates of environmental stress, the study analyzes high, moderate, and low success cases. Variables tested for correlation include ethnic and armed conflict, political structure, and degrees of governmental decentralization and freedom.
Data indicated a weak relationship between degree of freedom, regime type, and the success in alleviating poverty and environmental stress. However, cases of conflict and decentralization of government showed greater influence on poverty and environmental stress. Additional qualitative analysis of individual regimes and conflicts suggested greater influence of differing levels of poverty and environmental stress that have yet to be addressed by scholars in this field of inquiry.

**COLONEL SANDERS VS. RONALD MCDONALD: A COMPARATIVE CASE STUDY OF KFC AND MCDONALD’S IN CHINA**

Zachary L. Jordan (Dr. Laura Roselle) Department of Political Science

China’s economic development has recently made it possible for foreign companies to go after the Chinese domestic market. With a population of 1.3 billion people, China represents the largest consumer base in the world as well as the largest growth potential of any country (Lieberthal & Lieberthal, 2004). As international business has increased its focus on the China market, scholars have correspondingly paid much attention to the strategies employed by foreign multinational corporations (MNCs) operating in China. This study explores which factors best explain an MNC’s success in entering Chinese domestic markets. Whereas much of the current literature focuses on theoretical conceptualization or empirical analysis, this research conducts a comparative case study of KFC and McDonald’s in China. There are a number of key findings that should be of interest to managers and decision-makers within MNCs that are currently in or entering Chinese domestic markets: (1) being the first mover may provide the MNC with more opportunities to be successful, (2) congruency in entry joint venture partner interests may contribute to initial success, (3) evidence suggests that the degree of product localization strongly influence success, and (4) MNCs that consider government relations a priority may be more successful in China.

**ONLINE: A CASE STUDY OF NONPROFIT COMMUNICATION STRATEGIES IN THE UNITED STATES AND THE UNITED KINGDOM**

Linda M. Kurtz (Dr. Laura J. Roselle) Department of Political Science

Many scholars have determined that nonprofit organizations are instrumental in a self-governing society (Ferris 1998; Pope 2009; Rees 1999; Taylor and Warburton 2003). Successful communication strategies for nonprofits have been determined as well, and include defining a problem in a way that makes it appear manageable, presenting current and accurate data, and addressing key audiences with specific messages (Andrews and Edwards 2004; Rees 1999; Chew and Osborne 2008; Bennett 2008). It is evident that nonprofits fulfill different roles in different societies and are more likely to experience success when communication strategies are implemented. It is not clear, however, how different types of nonprofits with specific roles implement successful communication strategies, especially within different countries. This analysis uses a structured-focused comparative methodology to examine six different nonprofits in the United Kingdom and the United States to determine and compare the primary factors that affect their Internet communication practices. Those most heavily involved with each organization’s Internet presence were interviewed and their websites were examined with attention to specific characteristics, such as interactivity and donation capabilities. Overall, the research did not reveal large cultural differences between nonprofits in the United States and the United Kingdom with regards to their Internet communication strategies. There were no comprehensive differences in the primary audiences of the websites in each culture, nor were different comprehensive strategies employed in each culture; however, the findings from this research show that the primary content audience for each nonprofit may be related to the type of nonprofit.

**POLITICS OF POWER SECTOR REFORM IN TAMIL NADU AND UTTAR PRADESH, INDIA**

Kelsey E. Renner (Dr. Jason Kirk) Department of Political Science

This research examines which factors affect the characteristics of power sector reforms implemented in Tamil Nadu, India and Uttar Pradesh, India. The literature has recently seen a trend in privatization of the power sector. Additionally, in developing countries the reforms that have been seen by scholars tend to
address the unbundling into different utilities the generation, transmission, and distribution of electricity, the privatization of the power sector, and the establishment of independent regulators. This research used a comparative case study between Tamil Nadu and Uttar Pradesh, India, and measured the impact that interest groups and regional politics had upon the characteristics of the reforms passed. The study used an assortment of media reports, previous literature, the number of people employed by the state, and the percentage of the constituency that farmers make up in order to analyze the factors that affect power sector reforms in Tamil Nadu and Uttar Pradesh. The findings from the study of Tamil Nadu show that the presence of interest groups such as farmers and state employees negatively impacts the ability of reforms regarding pricing and privatization to be implemented. Additionally, it was found that the presence of regional politics does not have a strong relationship to the ability of power sector reforms to be passed and the weak relationship that it does have negatively impacts the ability for power sector reforms to be passed. The research hypothesizes that in comparison to Tamil Nadu, the power sector reforms in Uttar Pradesh will also be negatively impacted by the presence of interest groups, and that the pro central government views held in Uttar Pradesh will positively impact the ability of power sector reforms to be passed.

TRANSCENDING THE SECURITY DILEMMAS: A COMPARATIVE MULTILEVEL STUDY OF TRUST IN PEACE PROCESSES

Catherine T. Serex (Dr. Jason Kirk) Department of Political Science

This study seeks to understand how states and societies, through the leadership of political elites, attempt to overcome the security dilemma in both intra- and inter-state conflicts. It investigates the psychological concept of trust in the context of international relations theory, utilizing the peace processes that occurred at the end of the Irish Troubles (1990s), between Egypt and Israel (1979), and the continued mistrust between India and Pakistan that has perpetuated since partition (1947) as case studies. This study utilizes process tracing methodology to qualitatively analyze ‘turning point moments’ in the history of each conflict that led either to trust being built between elites or the collapse of trust and renewal of a state of insecurity. Common factors amongst cases that dictated the outcome of turning point moments were identified: regime change, public endorsement, rejection or oblivion, public and political weariness, presence of ‘spoiler’ groups, and concession making. These commonalities can be utilized as indicators in ongoing conflict situations as a means of identifying if the sequence and results of turning point moments have created an opportunity for political elites to make peace or to abandon its pursuit.

MEDIATION HEGEMONY: THE UNITED STATES AS A THIRD PARTY MEDIATOR IN THE 1990s

Catherine T. Serex (Dr. Laura Roselle) Department of Political Science

This study seeks to better understand what factors determine whether the United States can be considered a “successful” third party mediator during the 1990s. This study will define success as high levels of party adherence to stipulations of a peace accord five years after signing it. At the start of the 1990s, the era of bipolar relations sustained by the Cold War had collapsed, as had America’s perceived primary threat to national security, the Soviet Union. For a brief time prior to September 11, the United States experienced the absence of a pressing security dilemma, and had an opportunity to take on the role of an "honest broker" of peace, as it was no longer motivated by a need to contain communism. It seized this role during the course of the negotiations that led to the Oslo Accords (1993), the Dayton Accords (1995) and the Good Friday Agreement (1998). This study uses a structured, focused case study methodology (George & Bennett, 2005), compares levels of U.S. engagement in the negotiations of each case using an original "level of engagement" scale, and analyzes whether U.S. engagement positively or negatively affected treaty adherence. Level of engagement is measured by numerous factors such as size of U.S. delegation, role within the negotiations, whether or not the U.S. publicly endorsed the negotiations, and other factors. Level of adherence is measured by verifying if accord stipulations were carried out and in the time frame allotted by the accord. The data indicates that there is a positive, albeit weak relationship between U.S. levels of engagement and levels of adherence.
NORTH CAROLINA: PARTISANSHIP AND IDEOLOGICAL CHANGES IN AN EVOLVING SOUTHERN STATE

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The Democratic Party in North Carolina enjoys relative success across state and local elections, but for national level elections the Republicans Party has remained in control since the mid-twentieth century (Nie, Verba, and Petroick, 1979). In the 2008 election, North Carolina voters defied expectations by voting in favor of Democrats in races for national offices. In order to examine whether this change is an evolving trend or a temporary exception, partisan and ideological trends as well as voter registration trends are observed. This study of changes in ideological self-identification and party affiliation gives an assessment of North Carolina’s political makeup and how the voting population has been altered from 2005 through 2009. These differences are then compared to shifts in the state’s voter registration by party affiliation to determine whether the 2008 election is a function of an electorate’s changing composition.

Although North Carolina is deemed the most progressive southern state, this standing may be fleeting as the state comes to follow national tendencies and breaks with the standard observed in the rest of the region. Consequently, this research explores the growth in votes for Democratic and progressive candidates to understand the potential of a “new” North Carolina that is becoming more like its northern neighbors to form a new mid-Atlantic region in American politics (Knotts and Cooper, 2008).

PSYCHOLOGY

VISIBILITY OF PEDESTRIAN SIGNALS BY PEDESTRIANS WITH VARYING LEVELS OF VISION

Katherine N. Atkins (Dr. Alan Scott) Department of Psychology

Estimates derived from the National Health Interview Survey (2006) found 21.2 million adult Americans who reported trouble seeing, even with vision correction. As baby boomers age, the number of seniors with vision loss will grow substantially, and many will turn to public transportation or walking as their primary means of transportation. In an increasingly complex pedestrian environment, use of pedestrian signal indications is necessary, and safe initiation of crossings requires that pedestrians be able to locate, see, and accurately interpret information provided by pedestrian signals. Although U.S. traffic engineering manuals (e.g., MUTCD & ITE) set standards for signal sizes on pedestrian crossings, little research has been identified that assess their use by visually impaired populations, and one survey found that twenty-five percent of older persons in Orlando, FL had difficulty seeing pedestrian signals (Bailey et al., 1992). As the Americans with Disabilities Act requires that pedestrian facilities such as sidewalks and crosswalks be accessible to all users, including those with visual impairments, assessing the usability of crossing signals to visually impaired groups is vital. This research seeks to ascertain if current signal standards are appropriate for visually impaired pedestrians, as well as to evaluate the effects of certain environmental factors. Twenty-four participants with normal vision were asked to look at photos of crosswalks with pedestrian signals of different sizes (9 or 12 inches) on crossings of various lengths (5-8 lanes) and against different backgrounds (sky, trees, or buildings). Participants were shown a series of computer-presented photographs containing the elements of interest and were asked to identify if the pedestrian signal in each picture indicated the Walk or Don’t Walk phase and how much time remained on the pedestrian phase (if a countdown timer was present). Participants completed the task with unimpaired vision, as well as while wearing goggles that simulated 20/100 and 20/300 acuities. Analysis of data indicated that current legal signal size standards are in many cases too small for pedestrians with poor visual acuity to accurately determine the signal information. Signal background also appeared to play a part in ease of signal interpretation.
PROJECT EMO: INFLUENCES OF WRITING ABOUT PERSONAL EXPERIENCES ON PRODUCTION AND CONTENT

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Past research in emotional writing has found that when writing about emotional events, in comparison to non-emotional events, participants use more emotional words; emotional writing is also found to contain more cognitive words, which indicate that a writer is attempting to organize and understand the emotional event (Boals & Klein, 2010; Cohl, Mehl, & Pennebaker, 2004). This attempt to process an emotional event could become apparent in written self-editing behaviors such as pauses, which suggest that a person is thinking about what to write (Flower & Hayes, 1981b; Rau & Sebrechts, 1996). This study investigated the influence of emotions on both the content and production of writing. In terms of writing production, this study specifically examined how prompts indicating distinct emotional experiences influenced self-editing behaviors during the writing process. Each of 90 participants was asked to recount two positive, negative, or neutral experiences from his/her own life wherein one was the result of his/her own actions and the other was caused by another’s actions. We used the Linguistic Inquiry and Word Count (LIWC) (Tausczik & Pennebaker, 2010) program to identify emotional reactions within the written responses and a keystroke-logging program (Epting & Barker, 2009) to record any self-editing behaviors that occurred during writing production. The LIWC program identified emotional reactions by coding words into specific categories such as “positive emotion” and “negative emotion.” Deletions, insertions, substitutions, and pauses (specifically, number of pauses and average pause lengths) were tracked as types of edits. Preliminary analyses suggest that participants edit more when prompted to write about negative events than when prompted to write about positive or neutral events. Final data analyses will reveal if emotional content and self-editing differed between the positive, negative, and neutral conditions as well as if self-editing and emotional content depended on whether the participant wrote about an experience caused by his/herself or another person.

UNDERGRADUATES’ KNOWLEDGE OF NORTH CAROLINA CRIME

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The purpose of this descriptive study was to examine (1) people’s understanding of North Carolina law, (2) their estimates of recidivism rates, and (3) the sources of their crime knowledge. Three hundred and twenty undergraduates participated.

Research shows that public knowledge of crime is poor (Roberts & Stalans, 1999). Part I assessed whether students could accurately define felony, robbery, larceny, and burglary. We asked open-ended questions and determined the accuracy of the responses using NC Statutes. For felony and burglary, more than 50% of participants got the answer completely wrong. For larceny, close to 50% left the answer blank or said that they did not know. For robbery, 71.6% scored 1/3 possible points, indicating that they had some accurate knowledge of this crime.

People often overestimate rates of recidivism (i.e., reoffending; Roberts, 1992). In Part II, We asked participants to estimate recidivism rates for sexual offenders, burglars, domestic abusers, and criminals in general. Using the Bureau of Justice Statistics as a comparison, participants over-estimated the recidivism rates for sexual offenders and criminals in general, but underestimated rates for burglars. We were unable to get comparison rates for domestic abusers; our participants assessed their recidivism rates as higher than sexual offenders, burglars, and criminals in general.

Part III asked participants to identify the sources of their crime knowledge, because research shows that people’s knowledge of crime comes mostly from the media (Dowler, 2003). We asked participants how many times per month they watch particular TV shows (e.g., Criminal Minds, Dateline) and to identify different crime resources (e.g. books, class, etc.). The average number of crime TV shows watched in a month was 24.85, and participants watched 5.32 different crime shows per month on average. Participants indicated that they were gaining their crime knowledge through fictional sources of entertainment, such as crime drama series and movies.
Participants did not have accurate knowledge of NC crime or recidivism rates, and gained most of their crime knowledge from non-academic sources. This implies that there should be more emphasis on criminal justice studies in education.

A STUDY OF THE EFFECTS OF ASSOCIATIVE ENCODING IN YOUNGER AND OLDER ADULTS: IMPROVEMENT OF MEMORY FOR PAIRS

Jennifer K. Champ & Katy J. Milizio (Dr. Amy A. Overman) Department of Psychology

A recent study of memory in young and older adults (Overman & Becker, 2009) provided new evidence for the importance of forming associations during encoding of pairs of items. In that experiment, memory for word-face pairs was improved by repetitions of the pairs relative to repetitions of items in the pairs. Recent evidence (e.g., Naveh-Benjamin, Brav, & Levy, 2007) also suggests that using a strategy at encoding may improve later recall. However, to date no one has investigated the interacting role of repetition and encoding strategies. Therefore, our study examined both repetition and two different encoding strategies in younger and older adults. All participants were asked to look at two study lists of face-occupation pairs. One group of participants visualized a face doing an occupation (n=27 young; n=20 old) and the other group visualized a face speaking an occupation (n=33 young; n=22 old). Later, participants were presented with a pair and asked if they had seen it on the second study list. These test pairs were comprised of old pairs (seen on both study lists), new pairs (not previously seen), and rearranged pairs (contained faces and occupations that were old but were not the exact same pair as before).

Three 2 (visualization vs. speaking) X 8 (condition) ANOVAs were conducted on the reaction time, accuracy and discrimination data. Results showed that the visualization group performed more accurately and responded faster than the speaking group (p<.05). Regardless of encoding strategy, for pairs that were shown just once, accuracy was lower, and participants took longer to respond (p<.05). Also pair repetition increased discrimination between old and new pairs (p<.05). This supports previous findings that repetition aids in memory of pairs, and suggests that not all encoding strategies significantly improve memory. Specifically, visualization is superior to other examined strategies. This is important for any learner but, especially for older adults who need more assistance in recalling information. Strategies are useful for improving daily memory tasks for older adults. Our next step will be to examine ERP (event-related potential) data in order to measure brain responses and compare differences between age groups.

HOW ARE COLLEGE STUDENTS’ TIME PERCEPTION, PROSPECTIVE MEMORY, AND SELF-CONCEPT AFFECTED BY ATTENTION PROBLEMS?

Alexandra M. Dunn & Renee D. Robinson (Dr. Linda A. Wilmshurst) Department of Psychology

This study analyzed time perception skills in college students with significant attention problems (SAP) compared to peers without significant attention problems (CG: control group). The study further examined the links between time perception problems, self-concept, GPA, prospective memory skills (future memory planning), anxiety levels, and perceived support from family and friends. Students were assigned to the SAP group if they had been previously diagnosed with attention deficit hyperactivity disorder (ADHD) and/or scored above the ninetieth percentile on the Inattentive Scale (IA) or the ADHD Index Scale (AIS) of the Conner’s ADHD Adult Rating Scale (CAARS).

Participants completed multiple questionnaires, anxiety surveys, time perception tasks of real-world scenarios, and memory tasks. Results showed that the SAP group scored significantly higher than the CG on all four CAARS scales, as well as both the physical anxiety and stress scales. The SAP group also significantly over-estimated the total time engaged in the study and reported having significantly more problems in tasks that involved time perception and time estimation. Furthermore, the SAP group reported having more difficulty with their prospective memory, which can be defined as the “ability to follow through on intended behavior” (Kerns & Price, 2001) and is linked to planning ability. Problems with prospective memory in the SAP group may also be linked to lower self-concept, GPA, perceptions of total support, and higher anxiety levels.

The SAP group scored lower on the Total Self-Concept scale (TSC), had significantly lower GPA’s than the CG, and reported significantly less emotional and academic support from their mothers and fathers.
which led to experiencing significantly less total support than the CG. Overall, our results show that students with attention problems struggle academically and experience more difficulties with time perception, prospective memory, and self-concept compared to peers without significant attention problems.

**PARENTAL TEACHING AT HOME: CHILDREN’S ENGAGEMENT IN LITERACY AND NUMERACY WHILE COOKING WITH PARENTS AND SIBLINGS**

Lauren L. Finn (Dr. Maureen Vandermaas-Peeler), Department of Psychology

Parents teach their children through informal social interactions in a process known as guided participation (Rogoff, 1990). Although most research focuses on parent-child dyads, young children learn from both older siblings and parents through daily activities (Rogoff, 2003). Research has shown that parental teaching behaviors with one child are not representative of everyday social interactions with multiple children (Goncu, 1999). An observational between-groups design was employed to compare 15 triads (parent, preschooler and older sibling) with 15 dyads (parent and preschooler) engaged in an informal cooking task at home. Our findings confirm that parents use the cooking activity as a tool for teaching children about literacy in the context of recipe cards, and as a means of practicing basic mathematical skills such as counting, measuring and identifying shapes. Preliminary comparisons of dyadic and triadic interactions indicate that parents did more teaching of numeracy and general skills in the dyadic condition, and that younger children had more correct responses to parent guidance when the older sibling was not present. Parents in the triadic condition engaged in more complex literacy-related teaching of older siblings, whereas in the dyadic condition parents focused more attention on the pictures in the recipes. With regard to social interactions, more role negotiation, frustration and conflict occurred in triads than in dyads. These findings have implications for the connections that can be fostered between home and school to support children’s understanding of emergent literacy, numeracy, and social interactions in everyday activities performed at home.

**THE RELATION OF AUTISTIC TRAITS IN NON-AUTISTIC INDIVIDUALS TO INFORMATION INTEGRATION IN SPEECH PERCEPTION**

Charles Fleischmann (Dr. Amy A. Overman) Department of Psychology

The purpose of this study was to determine whether autistic traits among neurotypical (i.e. non-autistic) individuals are related to their ability to integrate information from multiple sources in speech perception. A recent study of speech perception in neurotypical individuals found that speech perception was less influenced by lexical information among participants who scored higher on the Autism Spectrum Quotient (AQ; Stewart & Ota, 2008). Our study extends this finding using visual, rather than lexical, influences by having participants complete the AQ and compare their results with their ability to perform computer-based lexical decision-making tasks. First, our participants (n=31) completed the AQ to place them on the autism spectrum. The AQ was designed to correlate with autistic traits, but scores on the survey vary substantially within the non-autistic population (Baron-Cohen et al., 2001). Then, our participants completed a speech identification task on a computer wherein they watched a mouth move on a screen as “ada” and “aba” were spoken. The motion of the mouth either matched or did not match what was heard. The participants then had to decide what they believed they heard while incorporating both audio and visual information. The results of this speech identification task, how well the participants were able to discern whether they heard “ada” or “aba” while also watching a mouth that either matched or did not match the audio, was compared with where they placed on the autism spectrum. Preliminary results indicate that higher AQ scores were, in fact, correlated with greater visual influence on consonant identification, seemingly contradicting the findings of Stewart & Ota (2008). Implications of these data will be discussed.
STUDENT, FACULTY, AND COMMUNITY MEMBERS’ MOTIVATION IN ACADEMIC SERVICE-LEARNING

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We are exploring the motivation of faculty, students, and community members involved in academic service-learning (AS-L) to continue their engagement in service learning. Research has shown that faculty employ service-learning pedagogy because it enables students to gain a deeper understanding of the course material, the challenges faced by the community, and their own personal responsibility in society. Research on student outcomes supports faculty perceptions (Abes, Jackson, & Jones, 2002; Banerjee & Hausafus, 2007; Eyler & Giles, 1999; Strange, 2004). Our research project only focuses on students at this time. It is important to measure the advantages and challenges of AS-L perceived by student participants. Understanding these perceptions can help shape AS-L programs to increase general participation and satisfaction in service-learning.

There were 163 participants (29 males and 134 females). Twenty-one participants were first-year students, 45 second-year students, 30 third-year students, and 67 fourth-year students. We conducted a questionnaire to students enrolled in diverse AS-L courses. Overall, 93.3 percent of the students surveyed recommended an AS-L course. Our findings suggest that student participants who recommended AS-L were significantly more likely to believe that AS-L positively affected their attitudes toward the course (t(160)=4.96, p < .001). These participants are also significantly more likely to continue at their site (t(158)=2.86, p < .01) and rated their site’s environment as supporting their motivations to continue going to their site (t(159)=3.07, p < .01). Thirty-seven percent of the participants indicated a decrease in motivation due to a lack of a relationship with the organization and/or trouble balancing their AS-L with previous commitments. Motivation increased for 32% of the participants due to the relationship they formed with the organization and/or clients. Motivation stayed the same for 29% of the participants; however, only 17% of this group indicated low motivation throughout the entirety of the course. Despite the decrease in motivation, the overwhelming majority of participants recommend AS-L. This indicates that the rewards associated with AS-L may be greater than the deterrents. This spring, our research will expand to assess how motivations have changed from the beginning, middle, and end of the semester.

THE RELATIONSHIP BETWEEN ONLINE AVATAR USE AND SELF-DISCREPANCY THEORY

Christopher E. Gay (Dr. Maurice Levesque) Department of Psychology

The goal of this research is to determine the psychological effects of playing a popular online role-playing game, World of Warcraft ©, with an avatar. This game is classified as a Massively Multiplayer Online Roleplaying Game (MMORPG). As of 2008, World of Warcraft subscribers accounted for 10 million of the approximately 16 million MMORPG players worldwide, (Woodcock, 2008) making for a very large group. This study will apply self-discrepancy theory’s predictions about psychological well-being to interpret the effects of online avatar use. According to this theory, conflicts arise between a person’s different “selves”, as well as the effects of these conflicts, or discrepancies, on an individual’s emotions and self-evaluation (Higgins, 1987). Higgins explains that there are six views that people perceive when evaluating themselves, only two of which are pertinent to this study, known as the actual and ideal views. The actual view refers to how individuals actually see themselves or how individuals believe they are seen by others. The ideal view refers to how individuals would ideally like to be or how they imagine others would ideally like them to be. The avatar, as an extension of self, may embody a self-discrepancy between an individual’s actual and ideal selves. Previous research (Bessiere, Seay, and Kiesler 2007) suggests that gamers create avatars with certain personality traits that are a compromise between their actual and ideal views of themselves. This project seeks both to expand our knowledge about the extent to which gamers create these “discrepant” avatars, and to investigate the effects of playing with an avatar that embodies an actual/ideal self-discrepancy. Participants are sent packets of study materials to complete from their own homes. The first packet contains a number of questionnaires that determine discrepancies between actual, ideal, and avatar personalities, as well as a journal to be filled out after gaming sessions. Preliminary findings are in agreement with the Bessiere et al study, but further analyses are needed to determine the specific psychological effects that we are looking at.
TEACHERS’ WAYS OF DEALING WITH EMOTIONAL SITUATIONS

Margaret E. Gourd and Gabrielle Newman (Dr. Alexa Darby and Dr. Richard Mihans) Department of Psychology and School of Education

A teacher’s first three years are highly influential, as one in five teachers leaves the profession during this time (Ingersoll & Smith, 2003). New teachers leave the profession due to high levels of stress caused by large amounts of work, student misbehavior, negative relationships with coworkers and administrators as well as pressure from high-stakes testing (Fry, 2007; Smethem, 2007, Veenman, 1984). The purpose of this study is twofold: first, to investigate the typical emotions associated with the teaching profession and second, to develop strategies beginning teachers can use in order to have successful and positive interactions with their administrations, colleagues, and parents. Participants in this study included two men and six women who currently teach in two elementary schools, two middle schools, and three high schools. Their years of teaching ranged from less than five years to more than ten. Data collection involved seven individual 30-minute interviews and one focus group, which lasted one hour and 30 minutes. The interviews covered the participant’s demographic information, his/her responses to a scenario about a colleague stealing a first year teacher’s work and discussion of the participant’s emotional situation in his/her teaching career. The focus group prompted the participants to make recommendations for supporting first year teachers. Individual interviews and the focus group were transcribed verbatim for analysis. The analysis involved coding the transcripts, comparing codes for accuracy and the merging of codes to categories (Boeije, 2010). This process assisted in the identification of patterns in situations, emotions, coping mechanisms, and catalysts to moral purpose for the profession. The findings specifically found that 71% of the participants described teacher exclusion within a work environment and 57% reported feeling helpless about student wellbeing. Developing an in-school support confidant was identified by 86% of the participants as an effective coping mechanism. Participants also recommended methods for improvement of teacher candidate preparations and revisions to current mentoring systems.

HELPING YOURSELF BY HELPING OTHERS: AN EXAMINATION OF PERSONALITY PERCEPTIONS

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Many organizations have come to recognize that simply “doing a job” as formally prescribed may not be enough to be competitive in a global marketplace (Organ, Podsakoff, & MacKenzie, 2006). For example, researchers and practitioners have found that when employees engage in positive behaviors not formally required by the organization, this has the potential, perhaps through various intervening mechanisms, to contribute to effective organizational functioning. Specifically, scholars have investigated the antecedents and consequences of a class of positive behaviors known as organizational citizenship behaviors (OCBs) (Organ et al., 2006). OCBs are extra-role behaviors (i.e., not part of one’s job requirements), which makes them conceptually distinct from task performance (Bateman & Organ, 1983; Smith, Organ, & Near, 1983). Examples of OCBs include helping a coworker with a job-related problem, accepting orders, respecting organizational resources, keeping the physical work environment clean and orderly, and completing tasks in a timely manner (Bateman & Organ, 1983). Because it is argued that OCBs “lubricate the social machinery of the organization” (Bateman & Organ, 1983, p. 588), as suggested above, OCBs may have indirect effects on organizational outcomes.

In an experiment examining the effect of altruistic behavior on work outcomes, we found that altruistic employees were perceived as having more favorable personality characteristics and received higher performance ratings and greater reward recommendations than their counterparts. Additionally, personality perceptions partially mediated the relation between altruistic behavior and work outcomes.

In a randomized experiment, we investigated the effect of altruistic behavior on (a) personality perceptions and (b) ratings of performance and reward recommendations. Compared to employees who withheld altruistic behavior, employees who engaged in altruistic behavior were rated as less neurotic, more extraverted, more open to experience, more agreeable, and more conscientious. In addition, these employees received higher performance ratings and greater reward recommendations than their counterparts. Thus, we found that altruistic behavior impacted personality perceptions, and both altruistic
behavior and favorable personality perceptions led to higher performance ratings and reward recommendations.

THE EFFECT OF MOOD AND COGNITIVE LOAD ON NONVERBAL SENSITIVITY

Brendan J. Igoe (Dr. Maurice Levesque) Department of Psychology

Social life requires that individuals attend to and decipher (decode) nonverbal behavior. Individuals use nonverbal behavior to judge emotions, understand what other people think, and the nature of relationships among others (Phillips et al., 2007). The results of empirical studies have yielded conflicting results in regards to the role of working memory and careful cognition-based deliberation with respect to the accuracy of nonverbal behavior decoding (Phillips et al., 2007). Similarly, research has focused on the effects of mood induction on the ability to accurately decode nonverbal behavior. The current study integrates research on mood induction and cognitive resources (in particular, working memory) to determine their independent and combined influence on a person’s ability to decode nonverbal social cues. The current study was conducted in a 3 (Happy, Sad, Neutral) x 2 (Cognitive Load, No Cognitive Load) design, in which participants were presented with one of three different films chosen due to their effectiveness in evoking mood (Gross & Levenson, 1995). To test their nonverbal accuracy, participants were administered The Interpersonal Perception Task (IPT; Archer & Costanzo, 1988; Costanzo & Archer, 1989), which requires participants to decode aspects of social behavior portrayed in video clips of 15 brief social scenes. During this test some participants were given a cognitive task meant to occupy their working memory. Findings of this study demonstrated that mood had a slight effect on nonverbal accuracy. More specifically, participants in the “happy” and “neutral” condition on average performed more accurately than those in the “sad” condition. These findings suggest that mood plays a crucial role in determining the nonverbal accuracy of an individual. Cognitive load did not seem to have a major effect on any group, suggesting that working memory may not be as significant of a factor in nonverbal sensitivity as originally hypothesized.

CAN THE 8 COIL SHAKTI ALTER SUBJECTIVE EMOTIONAL EXPERIENCE? A RANDOMIZED, PLACEBO CONTROLLED STUDY

Megan G. McGrath (Dr. Mathew Gendle) Department of Psychology

The Shakti is a commercially available transcranial magnetic stimulation (TMS) device that produces complex, low intensity magnetic fields and is marketed for use in promoting altered states of consciousness. Research involving the Shakti typically has not incorporated a randomized double blind design, and the publicized effects of the Shakti may result from participant expectancies or experimenter suggestion. This study measured the effect of 30 minutes of exposure to the Shakti’s Emotional stimulus train on response to static images, using a randomized placebo controlled design. After 30 minutes of Shakti exposure given while wearing earplugs and sitting blindfolded in a dark room (device was unplugged for placebo group), participants (11 males, 26 females) viewed a randomly ordered slide show of 54 images chosen from the International Affective Picture System (IAPS). The experimenters categorized the images according to emotional valence, resulting in a positive, neutral, and negative group. For each image, participants responded to questions of emotional valence, type of emotion, and effect strength using visual analog scales. The emotional valence of the image significantly affected responses to the image (all p’s < .0001), demonstrating that viewing the IAPS images resulted in varying emotive states that corresponded with the group the image was assigned. Neither the main effect of treatment (Shakti on or off), nor the interaction between treatment and image valence (positive, negative, neutral) were significant (all p’s > .09). Because the study followed parameters set by the device manufacturer, previous reports of alterations in emotional experience caused by the Shakti are likely due to participant expectancies or experimenter suggestion and should not be attributed to the direct effects of the Shakti TMS stimuli on temporal lobe activity.
SOCIAL PERCEPTIONS OF ALCOHOL-RISK BEHAVIORS AS AFFECTED BY AGE, GENDER, AND GENDER ROLE IDEOLOGY

Kelly R. Molin (Dr. Gabie E. Smith) Department of Psychology

Jones et al. (1984) identified stigma as having some characteristic or feature that classifies a person as “deviant, flawed, limited…or generally undesirable.” (p. 6). Stigma research overlaps with research on stereotyping; in the field of psychology, stigma is examined as it is associated with the health behaviors and illness. Research with patient populations has demonstrated the pervasive negative impact stigmas have on patient populations, such as depression, anxiety, low self-esteem, reduced social support, and avoidance of social interactions (Crandall & Coleman, 1992; Crandall & Moriarty, 1995; Kaplan & Toshima, 1990; Wright, 1983).

Another process that affects perceptions is social norming, which occurs when individuals either perceive peers to drink more heavily than they do in reality or they believe peers hold more positive perceptions about drinking than they actually do (Lewis et al., 2009; Cail & LaBrie, 2010; Martens et al., 2006; Lee et al., 2010). Contrastingly, stigmatization occurs when a characteristic or behavior is perceived as socially discrediting. Past research demonstrated that excessive alcohol use is highly stigmatized in certain populations. Existing research on stigmatized perceptions of alcohol use and abuse has not examined how the characteristics of those who abuse alcohol (i.e., age and gender) or perceiver characteristics (i.e., gender or personality type) influences stigmatization.

The current research used an experimental design in order to examine the influence of “user” and perceiver characteristics on the level of stigma directed toward those who abuse alcohol. Specifically, we used audio diaries to describe a fictitious target and his/her excessive alcohol-use behaviors. The audio diaries varied in target person age (midlife adult or young adult) and gender (male or female). Convenience samples of young and midlife adults were randomly assigned to one of four audio diary conditions.

Preliminary results demonstrated that the young adult participants reacted more negatively to the target than they perceived their peers would do, which confirmed the role of social norming processes in this population. The midlife adult participants did not demonstrate social norming processes in the perception of target. Both age and gender of the target affected stigmatization in the young adult and midlife adult participants.

THE EFFECT OF ENCODING STRATEGIES, SEMANTIC RELATEDNESS, AND PRACTICE ON MEMORY

Stephanie A. Robinson (Dr. Amy Overman) Department of Psychology

Research (e.g., Naveh-Benjamin, Brav, & Levy, 2007) suggests that using an encoding strategy can improve memory. However, it is unclear if a particular strategy is superior because of participants’ familiarity with the technique, because it draws on preexisting relationships, or both (Horiba, 1996.) Therefore, this study aimed to examine the effects that practice and encoding strategies (visualization and sentence elaboration) have on recall and if practicing different encoding strategies in succession would improve memory the same as practicing the same strategy twice. Additionally, the effect of preexisting relationships on learning novel information was investigated by using semantically related and unrelated word pairs. Participants (n=216) were assigned a strategy and told to use this strategy to memorize a list of word pairs presented on a computer. Participants were then given a second list of new word pairs and were either told to keep the same strategy (specific practice), or to use a different strategy (general practice). After each list presentation, participants completed a cued recall test.

A 2(encoding strategy) x 2(relatedness) x 9(practice type) ANOVA was conducted on the data. Results indicate that visualization is more effective than sentence elaboration and that general practice is as effective as specific practice in improving recall (p<.05). However, there was a larger difference in performance across strategies on Test 2 in groups that had sentence strategy first. Additionally, unrelated pair recall is more improved by the use of visualization than related pairs (p<.05). The findings of this study are important because, not only do they help researchers understand more regarding learning and memory, but they are also applicable to anyone wishing to learn novel information in a more effective manner.
EFFECT OF CRUDE KAVA ROOT EXTRACT ON HELSTEAD CATEGORY TEST PERFORMANCE IN YOUNG ADULTS

Anna K. Stroman & Danielle P. Mullin (Dr. Mathew Gendle) The Department of Psychology

The objective of this study was to assess if a single 200 mg oral dose of a standardized 30% kava (Piper methysticum) extract produced impairments in executive function, as measured by a computerized version of the Russell Revisited Short Form of the Halstead Category Test (RCat). Kava extract has been used in traditional rituals in the South Pacific and is known to produce a depressive intoxication much like that produced by alcohol and benzodiazepines. It has also been shown to reduce fatigue and anxiety. Kava, at anxiolytic dosages, is not associated with development of dependency or drowsiness, which are associated with benzodiazepines and anxiolytics. If it is found that kava has no effect on executive cognitive functioning it will be a reliable alternative to these medications.

The study was designed as a randomized, double blind, placebo controlled trial and took place at a private university in the United States. Participants included 54 undergraduate students (21 males and 33 females) (age 19.9 ± 1.3 years). Participants were randomized to either a placebo or kava group, and following a 3 h fast, ingested one clear, unmarked gelatin capsule that contained either 648 mg powdered gelatin (placebo) or 200 mg of a standardized 30% kava extract. A computerized version of the RCat was administered to each participant 60 minutes after capsule ingestion. Executive function was measured using the number of errors committed and average response time for each of the 6 subtests of the RCat. Results showed no difference in performance on the RCat between the placebo and kava groups. For both outcomes, the main effect of treatment and interactions between treatment and subtest, sex, and body weight were not statistically significant (all p’s > .15). It was concluded that a single oral dose of 200 mg of a standardized 30% kava extract had no effect on performance on the RCat in young adults. This supports prior research suggesting that unlike other anxiolytics, kava extract does not appear to induce cognitive dysfunction at clinically relevant doses. However, additional research is needed to determine if impairments in executive function are produced by higher doses.

DECISION-MAKING IN CRIMINAL JUSTICE

Laura E. Sweeney (Dr. Meredith Allison) Department of Psychology

Although weak alibis can be a cause of wrongful convictions, little research about alibis has been conducted (Wells et al., 1998). In this study, 360 participants acted as mock jurors and received a summary of a mock police report and trial. A suspect was questioned about his whereabouts on the night that a tenant was raped in his apartment building. This study examined the impact of three independent variables (alibi salaciousness, corroborator involvement, and corroborator certainty) on the participants’ perceptions of the alibi and defendant. In all of the alibi conditions, the defendant claimed that he was at home in his apartment when the crime took place. In the sexually salacious alibi condition, the defendant said that he was burning pornographic movies to DVDs to sell the next day. In the non-sexually salacious alibi condition, he claimed that he was burning movies to DVDs to sell the next day and in the control condition he said that he was simply watching a movie. The corroborator (the suspect’s girlfriend) was either an active participant in the alibi activities or an observer, and she was either 100% or 80% sure she was with the defendant that night. Participants completed alibi believability ratings and defendant and corroborator credibility ratings. They gave a verdict, stated their certainty in this decision, and suggested a sentence. Participants also completed two measures of their attitudes: one about legal issues and the other about social dominance. A series of ANOVAs showed that when the corroborator was 100% certain alibis were seen as more believable. Sentence length was shorter when the alibi was non-sexually salacious than the control alibi condition. With character trait ratings, the defendant was viewed more positively when the alibi was non-sexually salacious than the control. Regression analyses showed that higher levels of pretrial juror attitude scores were associated with lower alibi and corroborator believability ratings, higher certainty in verdict decisions, and a greater likelihood of recommending prison sentences.
CRIME BELIEFS: STEREOTYPES OF CRIMINALS AND CRIME VICTIMS

Laura E. Sweeney (Dr. Meredith Allison) Department of Psychology

A stereotype is a widely held belief about a specific social group. Stereotypes make cognitive processing easier but they often lead to negative evaluations and discriminatory judgments (Peters, Jelicic, & Merckelbach, 2006). This study is investigating people’s stereotypes of both criminals and victims. We need to have a better understanding of criminal stereotypes to determine the impact they have on the criminal justice system. There have been few psychological studies on criminal and victim stereotypes so research in this area is vital. In this study, 236 undergraduates thought of the type of person who would most likely commit/be the victim of several different types of crimes. Participants were asked open-ended questions where they wrote down the criminal/victim’s race, gender, age, and personality traits, and were given an “other” category. For race and gender, we coded participants’ answers categorically (e.g., male = 0). For age, we coded participants’ answers on a continuous scale (e.g., 30s = 35). We used the Big Five traits of personality to code the personality trait category (Engler, 2006). We included each of the Big Five traits (extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience), as well as the corresponding opposite trait (i.e., introversion, not agreeable), so there were 10 possible trait categories. Finally, in the “other” category, we coded participants’ descriptions that were not personality traits, such as “alcoholic” or “poor”. Two independent raters analyzed 30 questionnaires and the overall reliability for all of the above decisions was 96%. The results showed that most criminals were seen as male, except for shoplifters who were seen as female and underage drinkers who were seen as both male and female. Most criminals were seen as white, except for armed robbers who were seen as black. Most criminals and victims were believed to be young. Most victims were seen as white females. In terms of personality traits, the majority of criminals were described as not agreeable (e.g., selfish) and neurotic (e.g., aggressive). Victims were perceived as neurotic (e.g., weak) and agreeable (e.g., nice).

SELF-PROCESSES AND DEPRESSION: THERAPEUTIC IMPLICATIONATIONS

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By year 2050, approximately 46 million adults in the United States will at some time in their life be diagnosed with a depressive disorder (Heo, Murphy, Fontaine, Bruce, & Alexopoulos, 2008). The emotional costs to these individuals and their families, as well as societal costs such as decreased work productivity and increased medical care, are profound. While people vary in their biochemical predisposition to depression, the actual trigger of depressive episodes is almost always a significant and negative life event (Paykel, 1979). And although most individuals confronting such an event initially experience negative affect, a combination of biological, psychological, and social factors determine whether such emotions subside with time or if they develop into a full-blown depressive episode. Considerable clinical research has been conducted to investigate these various factors and, based on these findings, to develop appropriate interventions (cf. Julien, Advokat, & Comaty, 2008; Lambert, 2004). Unfortunately, as Kowalski and Leary (1999) noted a decade ago, there remains a divide between clinical research and research in personality and social psychology, those fields conducting the basic work on potentially relevant psychological and social processes. The purpose of my work has been to bridge that divide. I conducted a qualitative literature review focused on three areas of self psychology: self-regulation (how we monitor and modify our behavior and emotions in pursuit of our goals), self-evaluation (how we mentally represent who we are and how desirable), and self-presentation (how our mental representations of self and our goals influence and are influenced by our social interactions). Relevant articles published since 1985 in six leading journals (e.g., Journal of Personality and Social Psychology) formed the basic pool for this review. In addition to evaluating competing findings in order to draw general conclusions about these processes, I suggest how those conclusions can and should guide psychotherapeutic interventions. My over-arching conclusion is that depression is multi-determined and that the particular contributing factors vary from person to person. Thus, interventions need to be flexible and tailored to the individual. These three areas of self psychology provide a range of ideas well suited to support such flexible interventions.
RELIGIOUS STUDIES

PETER OF CLUNY: INTERPRETER OF ISLAM & A HISTORY INTERPRETED

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This research is a case study of a twelfth century abbot, Peter the Venerable, who organized a team of scholars to translate Arabic texts into Latin, the most notable of these being the first translation of the Qur’an into Latin in 1143. Motivated by a “know your enemy” attitude, Peter used this body of translated texts to compose his own apologetic and polemic texts, seeking to acquire a more precise understanding of Islam in order to more effectively combat it. Peter described the purpose of his project as an attempt to educate Christians about Islam in order to empower them to resist it, and was a critical figure within a greater movement in Latin Europe where the Church was consolidating its power. Peter plays not only the role of interpreter, but of the interpreted. His motivations, the development of the translation project, and the outcome of his project are all contested within modern scholarship. This paper treats Peter as both interpreter of Islam, and interpreted by recent scholars, both of which characterize the greater questions of knowledge production within scholarship.

The ideas formed during the times of Peter the Venerable reflect the tendency of Western Europe to construct an impenetrable wall between the West and East through a construction of Islam as a violent, cruel religion whose fanatics offered a choice of conversion or death, and whose prophet was a sorcerer who conjured up fake miracles and seduced men to heretical doctrine. Anyone who is attuned to their surroundings in the United States can see the implications of this centuries-old mistrust of Muslims and Arabs as “the other,” a view that is, in many ways, a product of medieval Europe.

JAINISM’S INTERSECTION WITH CONTEMPORARY ETHICAL MOVEMENTS: AN ETHNOGRAPHIC EXAMINATION OF A DIASPORA JAIN COMMUNITY

Brett A. Evans (Dr. Allocco) Department of Religious Studies

As the second-generation of Jain immigrants to the United States transition from youth to full-fledged adults, significant changes to the interpretation and practice of Jainism in diaspora have begun to emerge. Relying on participant observation fieldwork at the Jain Study Center of North Carolina community and eight interviews with members of this community, my research has sought to navigate the critical shift present between the younger generation and the older generation of this population and examine its potential causes. Jainism is an under-researched and little-understood religious tradition, which lends importance to this research and its aims. Interviews were conducted in an organic and conversational format, allowing the participant to help guide discussion, while still maintaining an emphasis on prepared questions. Each participant was addressed questions which related to current practices, views of environmental and animal rights movements, and life as a Jain in an American context. This research found that the absence of religious authority in diaspora and the increase of Western influence have redirected emphasis from ritual to ethical practice, particularly within the younger generation of the population. This increased focus on ethical practice has presented itself in the incorporation of elements from the environmental and animal rights movements. Additionally, it has increased the prominence of the core values of ahimsa (non-violence), aparigraha (non-attachment or non-possessiveness), anekantavada (non-one-sidedness), and their corresponding day-to-day actions at the expense of traditional ritual practices such as puja (worship). This work brings forth voices and experiences from a diaspora community to supplement and lend credence to the growing understanding of the potentially transitory state of this important religious tradition.
RECONSIDERING THE GODDESS IN THE SAINT: READING BRIGIT THROUGH A POSTCOLONIAL LENS

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A popular assumption regarding early medieval religion is that older, pagan deities gradually became absorbed into Christian saints, paralleling pagan conversions to Christianity. The so-called “Conversion era” Irish saint Brigit, often associated with the pagan goddess Brigid, is an example of this concept. As historian Lisa Bitel notes, the trend “since the early Middle Ages” has been to “[pore] over the earliest written lives of St. Brigit of Kildare to prove the chronological development of the Celtic goddess Brigit into the saint” using “pagan details” in writings about the saint Brigit, a stylized genre called hagiography, as evidence (Bitel 2002). Focusing on Brigit, my research addresses two primary themes: “Grand Narrative,” or linear history writing, as both oversimplification and reflective of the victor’s perspective rather than an objective record of events (Brown 2003), and the label “pagan” as a objectifying category constructed in opposition to a Christian subject rather than as neutral description of another belief system (Smith 2005). My approach was to apply postcolonial analysis, a critical tool which examines power dynamics and rhetoric, to a close reading of selected episodes from two of Brigit’s medieval hagiographies. Episodes chosen related to the pagan/Christian dichotomy and focused on issues of authority and identity and through a postcolonial lens, the boundaries between pagan and Christian are revealed to be much more blurry than the Grand Narrative suggests. As a result, I found the postcolonial concept of hybridity to be a helpful model for understanding complex figures such as Brigit. Hybridity allows for “difference and sameness in apparently impossible simultaneity,” a complex negotiation of authority reflecting neither a wholly orthodox or un-orthodox reality (Cohen 2000). Understanding Brigit as a hybrid demonstrates the limitations of binary categories, such as Christian/pagan, and reflects the need for more accurate and careful terminology in the study of early medieval religious shifts to be implemented within the field of religious studies.

FEMALE ORDINATION IN THE ANGLICAN CHURCH

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The role of women and women’s ordination in the church is a significant debate that faces the Anglican community. While church authorities have approved female ordination, opposing viewpoints found throughout the Anglican Church have remained prevalent because of different interpretations of scripture: specifically interpretations of the apostle Paul’s writings about women found in 1 Timothy 2:11-12 and 1 Corinthians 14:33b-35. In order to address the essential questions of why two opposing interpretations have formed around the same Biblical passages and which is superior, this study begins by examining these two opposing viewpoints found within the church. The results of the study show that Paul’s passages are interpreted differently based on whether individuals find themselves in the pro deutero-Pauline group or the pro-Pauline group. The pro deutero-Pauline group, also known as complementarian, has been found to take a more conservative, singular approach, accepting only one true interpretation of Pauline writings in the Bible. The pro-Pauline group, also known as egalitarian, accepts different interpretations of Pauline writings. As a result, the complementarian group rejects women as leaders in the church, while the egalitarian group supports women in the roles of deacon, priest, and Bishop. After developing a firm grasp on these opposing viewpoints, the study breaks down Paul’s passages in Timothy and 1 Corinthians, as it seeks to view them through the lenses of complementarians and egalitarians. Through historical and literary analysis, along with Biblical exegesis, this paper argues that Paul did not intend for all women, past and present, to remain submissive in the church. Instead, he encouraged them to learn and eventually teach in the church community. The study concludes that while there are two opposing viewpoints regarding female ordination in the Anglican Church, based upon Biblical interpretation of Paul’s writings, Paul indirectly laid the grounds of approval for female ordination in his future and our present time.
CHARITY OR JUSTICE: THE RESPONSE OF A FAITH-BASED COMMUNITY ORGANIZING GROUP

**Amanda R. Olmstead (Dr. Rebecca Todd Peters) Department of Religious Studies**

This research came about through a questioning of the ethics of the dominant model of neo-liberal globalization present in the world today. Neo-liberal globalization, which can be seen through the corresponding policies of free trade, deregulation, and privatization, has generated increasing income disparities found within the United States as well as between developed and developing countries. This increased economic globalization has far reaching implications for local communities, including Charlotte, North Carolina. The economy of the city has been affected by globalization, which demonstrates the connection between international policies and local communities. This ethnographic study is motivated by a concern for the increasing income inequalities that threatens local communities in the United States, and reports on how one community organizing project in Charlotte is assisting local residents and faith communities to engage in working for systemic change in response to such injustices.

Community organizing represents a unique way for communities to engage in working for justice, as it focused on justice rather than charity. In Charlotte, Helping Empower Local People, Inc. (H.E.L.P.), an affiliate of the Industrial Areas Foundation, uses the model of community organizing in order to engage faith communities and other civic sector institutions in a justice approach to create long-term solutions to social problems. As many faith communities, particularly Christian congregations, have traditionally responded to social problems through charity rather than justice, this study looks at a unique group of congregations employing a justice approach. Interviews were conducted with 20 clergy members and laypeople of H.E.L.P.-affiliated congregations in order to understand the factors that contribute to Christian congregations responding to social ills with a justice approach. Results show that views of what constitutes ‘justice’ greatly impacts the ways in which Christian congregations work to achieve justice and that types of motivators stated by clergy and laypeople as their reasons to work for justice greatly affect their level of engagement with justice work.

SOCIOLOGY AND ANTHROPOLOGY

THE ELEPHANT IN THE ROOM: THE TENSION BETWEEN ECONOMIC DEVELOPMENT AND THE ENVIRONMENT IN SRI LANKA

**Jack B. Dodson (Dr. Tom Arcaro) Department of Sociology**

The environmental impacts of culture in Sri Lanka can be seen in various places. To the north, farmers’ crops are destroyed by elephants in areas where humans never used to live. Mangroves that surround the coast of the country are dying, leaving the land susceptible to dangerous waves, like the 2004 tsunami that destroyed southern cities. Trash lines streets in Colombo and Kandy, even as a push for recycling arises. Tea, one of the country’s most abundant crops and second-largest export, is farmed very rarely using organic practices, as many farmers fear they’ll lose revenue. This presentation looks into how each of these issues has been caused by the culture in Sri Lanka, and how the country acts as a microcosm for environmental issues.

Part of what makes Sri Lanka such an interesting topic for environmental issues is that it had one of the most ancient water systems in the world, dating back to about 400 AD. It was one that used the land and irrigation to move water from city to city, building massive tanks that are now part of the landscape in the north. Since then, the leadership on environmental issues has dropped off as a civil war and massive tsunami have taken their tolls on the people and the land. Industrial development has taxed the natural resources, as it does across the world.

A large amount of what we found regarding Sri Lanka’s environmental issues was surprising—it was similar, in a lot of ways, to environmental issues the rest of the world faces. And what’s unique about the island nation is that because it’s so small with all these problems centered within it, Sri Lanka acts as a kind of microcosm. The film we were working on, “The Elephant in the Room,” draws upon our experiences in the country, so that Westerners can look at the issues through a lens they’re comfortable with and will pay more attention to what’s going on. What we were attempting to do was shed light on various problems that faced Sri Lanka. Our conclusions from the research were mainly that Sri Lanka’s
issues are similar to the rest of the world’s. But with such a small country, everything is interconnected, and all these issues are more prevalent, so it acts as a microcosm for problems with the environment. And at this point, it could either fall apart, or it could find ways to fix the issues.

Through research done for the feature-length documentary, we found a few major issues facing Sri Lanka’s environment: the human-elephant conflict, deforestation of mangroves, waste management systems and the issue of ecotourism, which has increasingly been grouped in with traditional tourism, blurring the line between travel and education that’s eco-friendly and ways to make money off wildlife and the environment.

In order to effectively back up our findings, we talked to numerous experts in the country. We conducted numerous interviews throughout the three weeks we were there, and many of our sources were professors, government workers, environmental activists, students, ecotourism employees, farmers and fishermen. These were people whose lives and work are directly impacted by environmental issues. Our research was closely connected to the LEAF conference, put on by the 2011 Periclean Scholars as a way to bring attention to environmental issues in Sri Lanka. Our film attempts to bring these ideas to a larger audience, setting the concepts up to be debated and discussed on a worldwide stage, rather than just at the University of Colombo during the conference.

THE ROLE OF ENVIRONMENTAL DEGRADATION IN COLLAPSE AS STUDIED THROUGH THE ANCIENT MAYA IN THE EASTERN PETÉN FOREST OF NORTHWESTERN BELIZE

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The research to be presented examines the impact ancient Maya populations in the central lowlands may have had on their environment. The means of analysis requires determining how soil deposition changed from Preclassic Maya occupation (400 BC - AD 250) to Terminal Classic Maya occupation (ending AD 900), as indicated by the stratigraphic deposition of soil. Utilizing a natural drainage for the study, samples of soil or archaeological matrix were recovered from 10 excavation test units placed in a natural drainage near central lowlands site of Grupo Agua Lluvia in the eastern Petén forest of northwestern Belize for analysis. The soil analysis consists of analyzing each strata for visual differences in color, texture, and composition, chemical differences from phosphate and gypsum. Radiocarbon samples were also collected during excavations and will, along with any ceramics collected, provide a chronological assessment of the deposition. The study builds on previous scholarship about the role of environmental degradation in the ancient Maya Terminal Classic collapse by confirming or denying, for this geographical area, others’ conclusions. The depositional process, setting and history of the drainage suggest not only the probability of cultural factors involved in environmental degradation, but more importantly will suggest a chronological model for this issue in northwestern Belize.

WOMEN AND GENDER STUDIES

NEW CONCEPTIONS OF MOTHERHOOD: THE CONTEXT AND IMPLICATIONS OF EMBRYO ADOPTION AND DONATION

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The application of patriarchal ideologies to the conceptualization of womanhood within Western society has created a female gender identity in which fulfilling the “mother role” is primary to normative femininity. Assisted reproductive technologies in contemporary society, such as in-vitro fertilization, have enabled some women to circumvent biological challenges to reproduction and to participate in roles of mothering which are highly valued in patriarchal contexts. However, the persistent pressure placed upon women to reproduce themselves—to parent children who are genetically theirs—has in many cases produced unanticipated results. In the case of in-vitro fertilization, it has led to the creation of an excess of embryos, a predicament which has become both the locus of political and religious discourses surrounding the definition of “life” and has also extended the concept of parental responsibility. My project investigates what have become the practical negotiations arising from this excess of embryos—embryo adoption and donation—by engaging with the narratives of 88 research participants who have participated in these
alternative reproductive pathways. My examination of these interviews is situated within a larger feminist analysis of patriarchal motherhood, which allows for the juxtaposition of women’s subjective experiences of infertility and reproduction with dominant cultural narratives and expectations of the mother role. Applying a critical feminist lens to this ethnographic inquiry into embryo adoption and donation productively reveals how conventional conceptions of womanhood significantly inform individuals’ perceptions of what being a woman entails, particularly as they relate to the implications of fertility for the embodiment of a culturally appropriate female identity. However, this analytical perspective also makes visible women’s resistance to the traditional motherhood paradigm by engaging with narrative elements which deliberately contradict patriarchal constructions of “woman” and “mother” and that signify women’s attempts to define new realities. Women’s experiences with embryo adoption and donation ultimately reveal the ways that the performance of these as-yet-undefined mother roles is rife with agential opportunities to shape a new and self-determined motherhood. This research asserts that it is because these women are actively reformulating familial structures in accordance with their personal lives that mothering within the contexts and newly forged relationships of embryo adoption and donation emerges as a women-centered experience that, in many ways, resonates with feminist negotiations of motherhood.