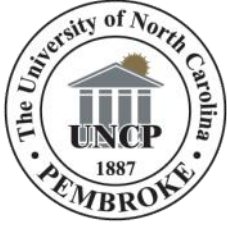


**Seventh Annual**  
**UNC Pembroke**  
**Undergraduate Research and Creativity Symposium**



**April 3, 2013**  
**Program with Abstracts**





Pembroke Undergraduate Research and  
Creativity (PURC) Center  
One University Drive  
P.O. BOX 1510  
Pembroke, NC 28387-1510  
(910) 521-6195

April 3, 2013

Dear Students and Colleagues,

The UNC Pembroke Undergraduate Research and Creativity Center cordially welcomes you to the Seventh Annual PURC Symposium, a campus-wide celebration of undergraduate scholarship. We are pleased to include 99 presentations by approximately 122 students and 51 faculty mentors, representing 18 academic departments.

The mission of PURC is to stimulate, support, and promote inquiry, discovery, and creativity in scholarship and the arts through mentored research experiences with faculty and other regional, national, and international scholars and professionals. The Center facilitates and coordinates preparation in research skills necessary for professional fields and graduate study.

The PURC Center supports Faculty Mentored Student Scholarship/Creativity. In addition to the *Student Travel Funds (STF)* for Research or Presentation of Results, which we have traditionally offered, we also grant *Student Scholarship Support (SSS)* and *Undergraduate Scholar Assistantships (USA)*. So far this academic year, we have provided *STF* for 42 presentations, and *SSS* for three student projects. Finally, we awarded 33 *USA*, which are funded in part by a grant through the Department of Education- Native American Serving Non-Tribal Institutions (DOE-NASNTI).

Contributions from Progress Energy help make this program possible. Progress Energy's commitment to higher education helps the PURC Center continue to provide UNCP students with extracurricular scholarly opportunities.

Many thanks go to all the students and faculty mentors, whose works are represented here today. I would also like to acknowledge the PURC advisory council for all of the hard work they have done to help bring this event to you, the Office of Academic Affairs, Provost Kitts, and Chancellor Carter. Thanks, also, to the graduate programs represented and the former students who have contributed to the session on graduate programs.

It is our desire that the PURC Symposium will be a launching pad for student participation in research and formal presentation venues. So, please plan to take your works to local, regional, national, and international meetings.

Best wishes,

A handwritten signature in blue ink, appearing to read "Lee Phillips".

Lee Phillips, Ph.D.  
Director – PURCC  
Associate Professor of Geology

***Seventh Annual - Pembroke Undergraduate Research and Creativity  
Symposium***  
Wednesday April 3, 2013  
*University Center - Annex*  
**Schedule of Events**

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**9:00 – 9:10**    **Greetings** – *with morning refresher*

Office of the Provost and Academic Affairs: Dr. Elizabeth Normandy

Director of the PURC Center: Dr. Lee Phillips

**9:10 – 10:00**    **Importance of Undergraduate Scholarship when applying to Graduate School**

**10:00 – 11:00**    **Morning Poster/Exhibit Session** (*First authors' last names: A — L*)

Posters and Exhibits will be present until 11:45am. Authors will be present during this time.

**10:45 – 12:00**    **Morning Oral Presentations / Performance**

10:45 – 11:00    Original Jazz Composition: “*Carlness*”

Dylan Fisher, accompanied by: Sean Evan and Tyler Pow

11:00 – 11:15    The Participation of Insurers in Medical Tourism

Jessica Jones

11:15 – 11:30    An Address to Humanity

Glenda Lowery, J.S. Moore, and S. Nadeau

11:30 – 11:45    Transcribing the Voices of the Lumbee

Amelia Philbrook

11:45 – 12:00    The Dark Side of Being Pretty

Brittany Taylor

**12:00– 1:00**    ***Deli Lunch Service***

**12:15 – 1:00**    **Keynote Address:** *From America’s Heartland to NBC’s Parks and Recreation:  
Research Notes from a Historian on the Go*

Dr. James Buss

## Schedule of Events (Continued)

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### **1:00 – 2:00 Afternoon Poster/Exhibit Session (*First authors' last names: M — Z*)**

Posters and Exhibits will be present until 2:45pm. Authors will be present during this time.

### **2:00 – 3:15 Afternoon Oral Presentations / Performance**

2:00 – 2:15 Comparing Mathematic Abilities of Children with Autism in Middle Self  
Contained and Inclusive Settings

Lori Vignali

2:15 – 2:30 Harsh Chatter

Madison Wilcox, C. Friedrich, C. Styers, M. Godwin, and J. Slavin

2:30 – 2:45 Externalities of Vertical Farming

Keith Witherspoon

2:45 – 3:00 Stage Play Performance: *The Last Unicorn*

Directed by Stephen Shane

### **3:30 – 4:00 Awards Presentation and Closing Remarks**

## Keynote Speaker: James Joseph Buss, Ph.D.

Dr. James Buss, a native of Ohio, is an Associate Professor, Chair of the History Department, and Director of the Honors Program at Oklahoma City University. He double majored in History and Economics and then completed an M.A. in Policy History at Bowling Green State University before earning a Ph.D. in History from Purdue University. In July, he will begin a new position, as Director of the Thomas E. Bellavance Honors Program, at Salisbury University in Maryland.

His professional experiences are diverse. Dr. Buss's work as an award-winning professor spans a variety of settings, from large public state schools to smaller community colleges. He worked as



an assistant curator at the Piatt Castles in central Ohio, was a research fellow with the Committee for Institution Cooperation, American Indian Studies program at the Newberry Library in Chicago, and held teaching and research fellowships at Purdue University. At Oklahoma City University he was named both "Full-Time Teaching Faculty Member of the Year" and "Distinguished Honors Professor of the Year." Although his academic training focuses mainly on the United States during the nineteenth century, Dr. Buss also teaches advanced courses in public history and museum studies, as well as courses on topics as varied early American history, the history of marriage and interracial marriages in the Americas, the history of race and racism in the performing arts, the history of American slavery, and nineteenth century American politics.

Most recently, he has been teaching a popular course called "Death and Dying in Early America."

Dr. Buss's scholarly interests include early American and Native American history and the history of race in the Americas. He has published numerous book reviews, encyclopedia entries, book chapters, and articles. Additionally, he has appeared on both NPR and C-Span 2's Book TV. In October 2008, he authored an article that was included in a special issue of "Frontiers: A Journal of Women Studies" on the subject of Native Americans and interracial marriage. More recently, the University of Oklahoma Press published his well-received book, *Winning the West with Words: Language and Conquest in the Lower Great Lakes* in October 2011. Currently, he is finishing an edited volume, *Beyond Two Worlds: Critical Conversations on Language and Power in Native North America*, for the State University of New York Press, and working on a second book-length project titled *Waiting for Godfroy: History, Memory, and Settler-Colonialism in the Great Lakes*.

## **Graduate and Professional School Discussion - Panel Members**

Ben Bahr is UNCP's William C. Friday Distinguished Professor of Molecular Biology and Biochemistry. His research focuses on age-related neuro-degenerative disorders and has worked with undergraduates in his laboratories at every institution he has worked. He is mentor to many UNCP students in Biology and Chemistry. In 2012, he was recognized by the Biology Division of the Council on Undergraduate Research with their Outstanding Mentor Award.

James Buss chairs the History Department and is Director of the Honors Program at Oklahoma City University. He double majored in History and Economics before completing an MA in Policy History at Bowling Green State University before earning a PhD in History from Purdue University.

Ashley Clark is a graduate of both UNC Pembroke and UNC Chapel Hill. She was selected for the UNCP-RISE program while at UNCP, and performed undergraduate research in chemistry with Dr. Roland Stout and Dr. Siva Mandjiny. Ashley earned her Bachelor of Science in Chemistry from UNCP in May 2009, and continued her academic career in the Graduate School at UNC Chapel Hill, where she earned her MS (Biochemistry and Biophysics). She now works in the Research Triangle Park as an Associate in the Regulatory Affairs division of Teleflex Medical Inc, (Durham, NC).

Angela McDonald is the director of UNCP's Master of Arts in Education (M.A.Ed.) in Clinical Mental Health Counseling, a program designed to prepare graduates as professional counselors in a variety of settings. She has 10 years of clinical experience in a variety of settings: a college counseling center, a family counseling clinic, private practice, a community agency, and a women's health care clinic. Her scholarship addresses the role of families in mental health care, mental health policy, gender and sexuality issues in counseling, and counselor education.

Jennifer Mish is the Director of Administration and Admissions for the Physician Assistant (PA) Program at Methodist University. Originally from Raleigh, NC, she earned her BS and MBA (2011) from Methodist University. She has worked as the Assistant Director of Admissions and, since 2006, has held the position of Director of Physician Assistant Admissions at Methodist University. Her role within the PA program has evolved from working solely with admissions and recruiting to being more actively involved with accreditation, program development, grant writing and the expansion of the program.

## PURCS Abstracts

### Poster / Exhibit Session – Morning

#### 1. The Origin Series

**Presenter:** Abri Abumohsen

**Faculty Advisor:** Mr. Brandon Sanderson

**Discipline:** *Art*

Most things that appeal to me from studying art are those that I can use to understand the world that I live in. My main objective within this series is to study the struggle between nature and humanity verses materialism and the machine. A lot of times I wonder what if we stopped the machine for a period of time. What if people were to get out of their little bubbles and see what is beyond the screens? The machine is becoming much more dominant in our daily lives, it even changed the way we connect to each other and socialize. The amount of information that we are exposed to on a daily basis is changing our process of thinking, and I just wonder how much of it do we really take in and think through and how much do we discard. I guess my ultimate question is how much is it important to keep a balance between living with manmade things and living with things that exists with man, and how important to distinguish the difference. These three pieces are my personal depiction of our connection with nature and mediation. Some of the figures within these sculptures carry a sense of freedom, spirituality, and inner peace. On the other hand, we have those that struggle to make that connection. The colors are chosen in a way that they depict a process of purifying, which is in a way we use mediation to feel that since of mental purity.

#### 2. Picture Perfect Series

**Presenter:** Abri Abumohsen

**Faculty Advisor:** Mr. Brandon Sanderson

**Discipline:** *Art*

Most of the pictures we see on our daily basis whether it is through advertisement, social media, magazines, or billboards all try to express that picture perfect /happy face to attract people towards their message. Another thing that I have realized is that every time I or anybody gathered to take a picture for a memory is that we all get in a certain pose and put on a face and take a picture. In my mind I'm thinking that a picture perfect should capture things for what it is. Pictures in a way express how much of us we want to share to the world or how much of us we think it would be accepted by our surroundings, which is in a way it projects the way we deal with our reality outside the picture. All the other intensely emotional expressive expressions such as mad, ugly, surprised, and screaming faces are all part of what completes us as human beings; however, they are overlooked most of the time because they are considered unappealing. This project was inspired from artists who work with the concept of making something beautiful out of something that was either overlooked or considered unappealing to people. The way I implied this concept is by bring those expressions to the viewers to emphasize those unappealing facial expression that express strength and presence. In this project I got my siblings to pose for me in faces that would express these things that we don't normally see in the picture perfect world. I told each one of them a scenario and I asked them with what type of face would you react and they expressed it. I took their pictures and I drew my sketches and later on I transferred it to a lithography print.



### 3. Personal Characteristics through Speech

**Presenter:** Lauren Bell

**Faculty Advisor:** Dr. Erik Tracy

**Discipline:** *Psychology*

When you hear someone speak, what comes to mind? How do your opinions of a speaker change based on the sound of their voice? When we speak, we convey more information than just our words. Prior research has shown that listeners are able to detect certain personal characteristics, such as race and gender (Lass, Mertz, & Kimmel, 1978). Furthermore, listeners presented with speech samples are able to make accurate judgments of more subtle characteristics, like sexual orientation (Gaudio, 1994; Smyth et al., 2003). The purpose of our study was to examine how listeners judge speaker personality and sociability based on speech samples from gay and heterosexual males. We hope to broaden our understanding about how we form judgments based on our perceptions of certain speakers. For example, listeners were presented with speech samples from gay and heterosexual males and were asked questions such as "would you want to hire this speaker?" Participants were not aware of the speakers' sexual orientation. We predicted that when speakers are presented with heterosexual and gay male speakers, listeners will assign heterosexual male speakers more favorable personal characteristics than gay male speakers.

### 4. Life and Peace

**Presenter:** Marcy Bishop

**Faculty Advisor:** Mr. Joseph Begnaud

**Discipline:** *Art*

My work is based around the use of color, form and the dream like mentality of nature and the obscurity of God and the world. Generating ideas from the atmosphere around me and what I observe in everyday life serves as the foundation from which I create. Utilizing light, dark, form, color and shadow, creating work that is a skewed version of realistic ideas. The concept behind my work is the idea of being so small in such an enormous, overwhelming world. Looking down from a plane peaking through the clouds, at houses and people living and carrying on with their everyday life below, is inspiring to me. Thinking about how small you are in such a big planet is a daunting thing. That is why I want to extend the notion of scale and size into cloud like forms as well as the human figure. God also comes into the reason why I paint these gigantic clouds. If God actually lives in the sky, is he in the form of a cloud? I am curious about all of these concepts of God and the all knowing gigantic mystery that looms over us, just as clouds do. It is intriguing to think of God in a physical state which is why I want to generate ideas of what God really is and to make technically proficient work but also convey a dream like reality in the form of paintings. Diving into this curiosity of God and cloud forms will be the base of what I am discovering as a student and a professional artist.

### 5. Resource Awareness for the Public Schools of Robeson County

**Presenter:** Lauren Blue

**Faculty Advisor:** Dr. Betty Brown

**Discipline:** *Educational Specialties*

Through field experience and interviewing teachers it has come to my attention that teachers were not aware of available resources for Robeson County Schools. Because of this knowledge I began to research and locate resources available to Robeson County Schools. This posed the question of whether all Robeson County teachers were unaware of the resources available to them or just the handful I had interacted with. Thus began the research project. I was able to locate public and private resources, resources avail-

able for disability services, monetary needs, supplies, books, health needs, and shelter. In order to get an answer to whether our teachers were aware of these resources, I created a survey using Qualtrics with the intent to distribute the survey to Robeson County teachers. In April, I will submit this information to the Institutional Research Board for approval. I will work with the Public Schools of Robeson to distribute the survey. I feel confident that the results will prove that Robeson County teachers are not aware of the resources available to them.

6. Effect of Simulated Microgravity on the Bacterial Characteristics of Nematode symbiont *Photobacterium luminescens*

**Presenter:** Matt Bowen

**Faculty Advisors:** Dr. Len Holmes  
Mr. Floyd Inman III

**Discipline:** *Chemistry and Physics*

In this study, the insect disease causing bacterium *Photobacterium luminescens* will be used as a model organism to determine if exposure to simulated microgravity affects bacterial characteristics. *P. luminescens* is a Gram-negative bacterium that is symbiotically associated with the beneficial nematode *H. bacteriophora*. Bioluminescence, antimicrobial production, and pigment production are all characteristics of the phase I variant of *P. luminescens* and can be utilized to monitor the status of the phase variant in culture. Transition of the phase I variant to the phase II variant is often attributed to non-favorable environmental conditions. It is worth mentioning that phase variation has also been observed in human pathogens (e.g. *Escherichia coli* O157:H7, *Salmonella enteritidis*, *Shigella dysenteriae*) where these bacteria utilize phase variation to evade any immune responses. Effects of microgravity on microbial growth should be studied because phase variation in any microbe may become problematic for humans during space travel.

7. Bio-Mimicking Pyruvate to Inhibit Lactate Dehydrogenase

**Presenter:** Davita Brockington

**Faculty Advisor:** Dr. Siva Mandjiny

**Discipline:** *Chemistry and Physics*

Lactate dehydrogenase is an enzyme that catalyzes the reaction of converting pyruvic acid into lactic acid. This reaction took place at pH 7.0. Molecules, such as acetamide and oxamic acid, which are believed to mimic pyruvate in terms of hydrogen bonding characteristics and ionic interactions with enzymes, were used to mimic pyruvate. Therefore, it is expected that acetamide and oxamic acid will both mimic pyruvate in order to inhibit the activity of lactate dehydrogenase. The activity of the enzyme with and without inhibition was measured and as expected it was determined that both molecules are inhibitors of lactate dehydrogenase. As expected oxamic acid is a competitive inhibitor of lactate dehydrogenase and acetamide is a noncompetitive inhibitor.

8. First Amendment Rights During School Hours

**Presenter:** Curtis Brooks

**Faculty Advisor:** Dr. Judith Curtis

**Discipline:** *Mass Communications*

Constitutional rights allow Americans to live freely on a daily basis and they are what make the country unique, as a majority of countries don't give citizens that opportunity. Arguably the most important right

that Americans have is their First Amendment right to freedom of expression. This right has come into question several times as to how it pertains to school policy across the country, most recently in the *Morse v Frederick* (2007) case in Alaska. The case dealt with a student's suspension from school after he was reprimanded for an expression that was considered to be illegal and inappropriate for a school setting. This paper outlines the different opinions that were expressed in each court ruling starting in District Court to the Ninth Circuit Appeals Court and as it finalized in the Supreme Court in 2007.

#### 9. Detection of Cadmium in Human Hair Using Atomic Absorption Spectroscopy

**Presenter:** Jessica Brown

**Faculty Advisors:** Dr. William Brandon  
Mrs. Shanna Harrelson

**Discipline:** *Chemistry and Physics*

Cadmium (Cd) is a toxic heavy metal with no known metabolic function. It can be found in soil, cigarette smoke, water, and even in food. Research in detecting trace levels of Cd in human subjects is the subject of growing interest due to industrial effects on the environment and on those employed by certain industries. Cd concentration in hair may prove to be a reliable indicator of past (perhaps chronic) ingestion. In this work we will review existing literature to determine if there exists any established toxicity levels of Cd in hair. In addition, we will address sample preparation methods, particularly those problematic issues related to sample variation. In the meantime we shall establish, via statistics, the limit of detection (LOD) for a Varian Atomic Absorption Spectrometer (model number –55B and specified LOD (Cd) – 10 ppb) and determine if trace levels of Cd may indeed be detected from hair samples of selected individuals.

#### 10. Testing A Neuroprotectant for Improving Memory in Aged Rats

**Presenters:** Olivia Bullard  
Pamela Quizon

**Faculty Advisors:** Dr. Ben Bahr  
Dr. Samuel Ikonne  
Mrs. Heather Romine

**Discipline:** *Biology*

Part of my research this summer was to test out the proof-of-concept lysosomal modulator Z-phenylalanyl-alanyl-diazomethylketone (PADK) in aged rats. This small molecule is given key attention due to the many studies showing its ability to enhance lysosomal enzyme levels and produce protective clearance of PHF-tau and A $\beta$ 42 in the brain. PHF-tau (hyper-phosphorylated tau) and A $\beta$ 42 (Amyloid beta) is the accumulation of protein as well as neurofilament in PHF-tau in the brain that has been thought to contribute to Alzheimer's disease (memory loss). The aged Fischer and Long Evans rats provide a natural model of aging and cognitive decline and may be more translatable to humans, as compared to transgenic mouse models used previously to assess lysosomal modulators – the mouse models focus only on one particular aspect of the disease. Two different tests were performed on the rats, the SAB (Spontaneous Alternation Behavior) Experiment and the Passive Avoidance Experiment. These test should show how age and the administration of a certain drug, PADK affect two different types of rats who are of different ages.

## 11. Achromatic Woodcuts: Aegis

**Presenter:** Lateesha Caswell

**Faculty Advisor:** Mr. Brandon Sanderson

**Discipline:** *Art*

Throughout history people have looked towards the sky wondering what was there, but I found myself pulled in a different direction: towards the sea. I was constantly filled with questions of what creatures could possibly be living within the depths of the ocean, how they lived and adapted in their environments. It was then that I started to have an idea of creatures whose sole purpose was to protect the other creatures of the ocean, and thus my Aegis series was born. I was filled with images of creatures with humanistic features that were born the same time as another with innate knowledge of how to care for and protect its chosen sea creature.

Now that I had this idea that was floating around in my head, I could not find a proper outlet to express what I was seeing in my head. I was introduced to the method of wood carving to create images by my drawing professor. I took to it instantly and before I knew it, I had created my first piece. I felt that I had finally found a medium that would allow me to be able to accurately illustrate the images that I had in my head. Not only was I finally seeing my ideas come to life, but with each cut into the wood I made, I felt relieved as if the act of carving the wood block was therapeutic in itself.

## 12. Let's Play a Lovegame: The Prevalence of Sex in Lady Gaga's Lyrics and Music Videos

**Presenter:** Ashley Cole

**Faculty Advisor:** Dr. Judith Curtis

**Discipline:** *Mass Communications*

Since Lady Gaga jumped on the music scene with her 2008 hit "Just Dance," she has become known for her racy and sexual lyrics and her provocative music videos. She sings openly about sex and wears little clothing in her performances. It is for this reason that some countries boycott her music and some parents prohibit their children from listening to her. Lady Gaga's sexuality is very much a part of her persona. Just how prevalent is sex in her lyrics and music videos and how has it changed over the years? The researcher listened to six popular Lady Gaga songs, two from each of her three albums, and looked for the keywords "sex," "kiss," "love," and any sexual innuendo. The researcher also watched the music videos for each song and looked for simulation of sex, kissing, and groping. The researcher noted the number of times each key word or action occurred for each song and music video in order to find out whether the sexual content of her lyrics and videos has gone up or down from her first to her third album. The researcher found that there was a significant decline in the amount of sexual content in Lady Gaga's lyrics over the course of her three albums. The sexual content of her music videos only declined slightly. These findings suggest that Lady Gaga is maturing as an artist and isn't relying so heavily on sex to sell her albums.

## 13. Handedness in Capuchin Monkeys (*Sapajus libidinosus*)

**Presenter:** Rachel Cole

**Faculty Advisor:** Dr. Freya Liu

**Discipline:** *Psychology*

Nonhuman primate tool use is interesting to study because it can inform us about the evolution of tool use in the human lineage. Nut cracking is a form of complex percussive tool use found so far only in humans, wild chimpanzees, and wild capuchin monkeys (*Sapajus libidinosus*; Fragaszy et al. 2004). Studying features of nonhuman primate tool use may reveal evolutionarily significant features that were important

in the evolution of human tool use. For example, high level of brain lateralization was probably preceded by division of labor between the two hands (handedness) in complex tasks and may also have given rise to language in early human ancestors. Most studies involving handedness in capuchins were conducted in a laboratory setting. This study aims to examine manipulation and handedness in the wild capuchins in spontaneous nut cracking which is a highly complex tool use behavior. For this study, hand use in positioning of the nut on the anvil was coded from field videos (7 hours, 317 nut-cracking episodes). We found that four monkeys showed a left hand bias; one monkey used both hands, and the other two monkeys showed a right hand bias. In conclusion, even though nut-cracking is very strenuous and capuchins have to use both hands to lift the heavy stone tool, they do show handedness in positioning events throughout a nut-cracking episode. Thus, capuchins serve as a unique reference point in the study of evolutionary origins of tool use by ancestral hominids.

14. A model of brain damage to study early and delayed responses with focused opposing gene profiles that make up the brain's response to injury

**Presenter:** Armando Corona

**Faculty Advisors:** Dr. Ben Bahr

Heather Romine, Ebru Caba,  
Robert C. Elliott, Hsin-wei Wang,  
Charles Glardine, Don-Guk Shin

**Discipline:** *Biology and Chemistry*

During excitotoxic injuries, genes are activated in the hippocampus (brain section dealing with memory) that involve degenerative and protective pathways. First, Hippocampus slices placed in a dish were exposed to NMDA mimicking excitotoxic events (such as stroke) for 20 min. Next, total RNA was isolated in a 1 h to 24 h time interval using an Affymetrix neurobiology-focused array gene chip. Finally, informatics methods (storing, retrieving, organizing and analyzing biological data) were used to test for opposing gene expression. Interestingly, after excitotoxic exposure, two groups of 22 and 27 genes showed expression during the first hour and 24 h after exposure. Among these genes, Egr-1 and NOR-1 expressed biphasic responses in which both exhibited early induction and late suppression. Soon after excitotoxic mimicking, 14 genes linked to pathogenesis showed up-regulation and 9 pro-survival up-regulated 1 h after exposure creating responses that oppose pathogenesis. In comparison, at 24 h post insult, delayed degenerative response consisted of 5 up-regulated pathogenic genes and 9 down-regulated pro-survival genes. In addition, delayed opposed pathogenesis responses included 6 up-regulated pro-survival genes and 4 down-regulated pathogenic genes. Overall, this data shows the importance of identifying the pathways that will help differentiate the stages in brain injuries. In conclusion, understanding the expression of genes during excitotoxic events may lead to finding new ways to treat stroke and other brain injuries.

15. The Impact of Hair Dye on the Determination of Dextromethorphan in Hair

**Presenter:** Qui'Aaja Daniels

**Faculty Advisor:** Dr. Meredith Storms

**Discipline:** *Chemistry and Physics*

While hair has several obvious advantages over the more traditional matrices for workplace drug testing, there is a concern that cosmetic treatments (hair dyes, chemical treatments, etc) could be used to deliberately remove drugs from hair. With the use of permanent hair dye, the internal structure of the hair can become damaged and therefore, the structure of the drug may be altered. If hair dye (or some other cosmetic treatment) decreases the drug concentration, then using hair in workplace drug testing may not provide reliable results. Thus, the goal of this research is to employ solid-phase extraction (SPE) and high-

performance liquid chromatography (HPLC) to study the impact of hair dyes on the determination of dextromethorphan in hair.

## 16. Through Another's Eyes

**Presenters:** Anthony Davis  
Gerald Hall

**Faculty Advisor:** Dr. Beverly King

**Discipline:** *Psychology*

Video games are one of the most influential and involved forms of media in the modern world. It stands to reason, then, that video games can be used to help combat stereotypes and prejudice in an incredibly technological society. By basing the choices within the game around the causes and effects of prejudice, it can help people look through another's eyes and see the true damage prejudice creates.

This game, titled "Through Another's Eyes," puts players in the position of the stereotypically-racist white male. After interacting with several people of different races, he encounters a ghost that forces him to live the lives of the same individuals he oppresses. Each of the levels will revolve around stereotypes of a certain group (Native American, Oriental, African, and Hispanic) and each level will feature a different video game genre (puzzle, survival, adventure, and shooter) which will allow the player to experience the stereotypes and their effects on individuals.

## 17. Isolation of Soil and Soil Cover Nematodes from Different Locations Surrounding UNC Pembroke

**Presenter:** Mac Davis

**Faculty Advisors:** Dr. Len Holmes  
Mr. Floyd Inman, III

**Discipline:** *Chemistry and Physics*

Nematoda is the second most biodiverse phyla of the animal kingdom with the first being Insecta. Nematodes are non-segmented roundworms that inhabit many different niches in aquatic and terrestrial environments. These organisms exhibit different lifestyles that include free-living, parasitizing or predaceous. *Heterorhabditis* spp. and *Steinernema* spp. are beneficial nematodes that are equipped with necessary biological adaptations that allow them to parasitize crop insect pests (i.e. entomoparasitic). These two nematode species are commonly isolated from soil (*Heterorhabditis* spp.) and soil cover (*Steinernema* spp.) To analyze the quantity and species of insect-parasitic nematodes found within Pembroke, North Carolina, a nematode isolation protocol is employed. The isolation protocol is centered on the usage of a Baermann funnel apparatus. Samples consist of various soils and soil covers ranging in depths from 0-20 cm. Soil pH is measured with a laboratory pH meter. pH is determined by properly mixing one portion of soil to five portions of water. Filtrate generated by the Baermann funnel apparatus is microscopically examined after two days to detect the presence of viable nematodes. Soil samples from multiple locations in Pembroke are continuously taken. Sampling areas include forests, agricultural fields, animal pastures, wetlands, and the campus of UNC Pembroke. As isolation techniques improve, further research will be performed to determine the species of insect-parasitizing nematodes found within the Pembroke area.

## 18. Improved Tools for Studying Brain Chemistry: Imaging and Quantifying Microiontophoresis

**Presenters:** Mac Davis  
Jessica L. Stancil

**Faculty Advisor:** Dr. Paul Flowers

**Discipline:** *Chemistry and Physics*

Microiontophoresis is a technique permitting the direct delivery of drugs to specific regions of the living brain that has been used in various neurochemical studies over the past several decades. Despite its increasingly widespread application, a reliable approach to quantifying the amount of compound delivered via this technique has yet to be established. We are working to develop a protocol that will permit both quantification of iontophoretic ejections and real-time imaging of the ejection process. Our experimental approach employs a combination of video microscopy, microspectrometry, and amperometry to evaluate the ejection process under a variety of experimental conditions relevant to typical neurochemical applications. This poster summarizes preliminary results obtained on the microscopic characterization of pneumatic and iontophoretic ejections of model dye compounds, and describes plans for extending this research to include simultaneous amperometric measurements. Funding support from the Pembroke Undergraduate Research and Creativity Center and the North Carolina Space Grant Consortium is gratefully acknowledged.

## 19. Flexible and Inexpensive Laser Kit for Laboratory-Based Homework

**Presenter:** Ed Derosier

**Faculty Advisor:** Dr. William Brandon

**Discipline:** *Chemistry and Physics*

As part of an ongoing effort to include work study students in the development of flexible and inexpensive modular components for physics laboratory-based homework assignments, a prototype PVC-housed laser and detector was designed, fabricated and tested. Incorporating a few additional components, while maintaining the total material/equipment cost below a proposed twenty dollar deposit fee, results in the ability to conduct quantitative lab activities addressing reflection and refraction, polarization and optical activity, interference and diffraction. More challenging activities include laser module I-V characteristic (requires two DMMs), laser beam shaping with cylindrical lens and a demonstration of a laser sound transmitter (requires PC device with USB and soundcard).

## 20. Ethics in Social Research with Children

**Presenters:** Mari DeRuntz  
Jerica Janney

**Faculty Advisor:** Dr. Beverly King

**Discipline:** *Psychology*

Empirical research methods in the social sciences sometimes utilize controversial methods to glean unbiased data from its subjects. These methods might include deception, pressure, exploitation or other methods, any one of which has the potential to cause emotional damage in its subjects. Both psychologists and sociologists adhere to a set of professional ethical guidelines; research projects must pass a research review board before commencing. However, social research also exists in the real world, outside the safety net of professional empirical research and its code of ethics. These social tests are spontaneous and conceived of with earnest social welfare at heart: Jane Elliott's classroom experiment "Blue-Eyed Brown Eyed," parental decisions to raise children in a gender-neutral setting, and loving parental attempts to shield their children from society's ills. Two criteria are present in empirical professional research that

are generally overlooked in “real world” attempts to address social problems, such as prejudice and discrimination: voluntary participation and overall confidentiality. This poster explores three instances of social research on children—a blend of “real world” and professional research—and critiques them according to current ethical professional guidelines: the Jane Elliott “Blue-Eyed Brown-Eyed” classroom exercise, Mamie and Kenneth Clark’s Doll research, and the Sherif et al. Robber’s Cave study.

## 21. Gendered double standards toward age-discrepant relationships

**Presenter:** Joey Dupree

**Faculty Advisor:** Dr. Melanie Hoy

**Discipline:** *Psychology*

The present study examines if people within society demonstrate a gendered double standard toward relationships with substantial age-gaps between them (i.e., May-December relationships). The purpose is to gain a better understanding why this double standard exists, the extent to which it exists, and the demographics in which it is most prevalent. Western society, especially as evident in media representations, portrays older male-younger female age-discrepant relationships in a more favorable light. Male-older May-December relationships are more prominent and more socially acceptable than female-older May-December relationships (Lehmiller & Agnew, 2011). By reviewing participants’ perspectives on May-December relationships we can potentially discover how gender stereotypic attitudes are formed and maintained within individuals, and to what extent these attitudes affect their judgments of non-traditional (i.e., socially unacceptable) relationships. Participants will be 100 adults recruited from the Mechanical Turk data collection program. Measures will include a demographic questionnaire and a series of vignettes about different types of relationships. Participants will rate each relationship on predicted outcomes, such as: social appropriateness, level of commitment, and relationship duration. It is predicted that a double standard exists in favor of male-older/female-younger age-discrepant relationships: the classic May-December relationships. Female-older/male-younger relationships are expected to be viewed more negatively than the classic May-December male-older/female younger relationships based upon content analysis of popular media.

## 22. Social deconstructionist analysis of marginalizing legislation

**Presenter:** Joey Dupree

**Faculty Advisor:** Dr. Beverly King

**Discipline:** *Psychology*

Society has sought, through political and legal means, to construct and define both racial and sexual orientation categories as a means to control and subjugate individuals that do not fit into the hegemonic sociopolitical characteristics of American culture. The present study analyzes the social psychological antecedents and consequences of anti-miscegenation laws and anti-gay/lesbian marriage legislation utilizing a social deconstructionist approach. A deconstructionist approach promises to question the utility and relevance of social categorization, and explain the limitations to which legal and governmental systems can interpret and intervene in human and civil rights issues associated with social identity or categorization. Social deconstructionism theory can also elucidate the interconnectedness of the ambiguous, fluid, and often arbitrary, categorization criteria utilized in both racial and sexual orientation classifications.



### 23. Engaging Secondary Education Students using Biochar

**Presenter:** Indya Evans

**Faculty Advisor:** Dr. Deborah Hanmer

**Discipline:** *Biology*

Biochar is produced by heating organic matter to high temperature in the absence of oxygen. Volatile organic molecules are driven off leaving behind a mostly carbon matrix. Biochar is of interest because it has been shown to significantly improve soil fertility, texture, and water holding capacity when added as a soil amendment. Unlike other forums of carbon added to the soil, biochar does not decompose. Thus has the potential to mitigate global warming by sequestering CO<sub>2</sub> in the soil.

In secondary education it is important to use an inquiry-based approach with the students. Using an inquiry approach encourages the students to use their critical thinking skills, to ask question, and to draw conclusions. I created and performed an experiment using biochar and worms, the experiment shows which soil is rich in nutrients by observing how the worms migrate within the soil. The worms can also be used to indicate unhealthy soil as the worms move away. I have created a lesson plan, which can be used by middle and high school teachers, to further their students' education in sustainable agriculture concepts. The NC essential standard I used for this experiment is EEn.2.8: evaluate human behaviors in terms of how likely they are to ensure the ability to live sustainably on Earth. The clarifying objective used is EEn.2.8.2: critique conventional and sustainable agriculture and aquaculture practices in terms of their environmental impacts.

### 24. Vocalizations in Nut-Cracking by Wild Capuchin Monkeys in Piaui, Brazil

**Presenter:** Patience Fortner

**Faculty Advisors:** Dr. Freya Liu  
Dr. Antonio Souto

**Discipline:** *Psychology*

Studying vocalizations of nonhuman primates will inform us about evolution of human language. There has been much focus on vocalizations in foraging, anti-predatory situations and group social interactions. However, vocalizations during tool use have never been documented before. Wild bearded capuchin monkeys routinely use heavy stones to crack open hard nuts, which is a complex form of tool use only also observed in wild chimpanzees and humans. The purpose of this study is to describe the vocal behaviors in capuchin monkeys during spontaneous tool use. Capuchins' tool use parallel in complexity compared to that of wild chimpanzees, but capuchins are far more distantly related to humans as compared to chimpanzees (Fragaszy et al. 2004). Our research team recorded seven wild capuchin monkeys during nut cracking sessions in Piaui, Brazil. From these videos, we coded monkeys' actions, (a total of about 305 episodes, 218 vocalizations), such as the number of strikes, the number of vocalizations, and the type and context of the vocalizations during each nut-cracking episode. We excluded vocalizations emitted in a social context and only focused on those emitted when the monkey was alone and cracking nuts. Here we describe the vocalizations and some preliminary contextual variables. This study will inform us about vocal behavior patterns during tool use by nonhuman primates, adding a unique point in the discussion of co-evolution of tool use and language in the human lineage.

25. Earthquakes in Southeastern NC?: Unit Plan about Earthquakes and the 1886 Charleston, SC Earthquake

**Presenter:** Emily Gabzdyl

**Faculty Advisor:** Ms. Amy Gross

**Discipline:** *Geology and Geography*

Many of our middle and high school students, as well as the general populous, are completely unaware that we can feel earthquakes here in southeastern North Carolina. Some were reminded of this possibility during the Mineral Springs, VA earthquake in Fall 2011.

The goal of this research project was to collect first-hand accounts of the 1886 Charleston earthquake to create lessons inspired by the NSTA publication *Earth Science Puzzles: Making Meaning from Data*. In this text, a lesson plan has students creating a Modified Mercalli map based on first-hand accounts from an earthquake in the northeastern United States. This lesson has been recreated to act as the final lesson in the unit plan. This unit plan introduces students to earthquakes, what causes them, how they are measured and what we can do to protect ourselves from them.

Data for this project came in the form of newspapers articles published shortly after the earthquake. We collected this data by going to the Cumberland County Headquarters Library, the North Carolina State Library, and the College of Charleston Library. Newspapers from all over the region were available in the form of microfilms. The libraries also allowed us to find printed books full of first-hand accounts, including *City of Heroes* and *Low Country Quake Tales*.

Our general populous is unaware that we are truly in danger during the next large Charleston earthquake. Our buildings are not built to earthquake codes and our population does not know what to do in case of an earthquake. This unit plan is to act as a rude introduction to our students to hopefully allow later generations to be more prepared than we are today.

26. David and Confucius

**Presenter:** Jaclyn Gray

**Faculty Advisor:** Dr. John Labadie

**Discipline:** *Art*

“David and Confucius” represents a time when I wanted to be independent and do things on my own, but I had no choice but to become dependent on other people. Cats are notorious for being independent creatures and not wanting to be held by anyone. The cat being held forcefully by its owner represents me being held back from what I wanted so desperately, which was freedom. I suffered from anxiety and often my brain wouldn’t let me do the things that I wanted to do, which was to not rely on others and to be on my own. Because of this, I was often dependent on my parents and family members for everything.

27. Untitled

**Presenter:** Jaclyn Gray

**Faculty Advisor:** Dr. John Labadie

**Discipline:** *Art*

I was born with a Pectus Excavatum, which is a condition where the chest is concaved. I had surgery at the age of twelve because of the severity of my chest. After the surgery, I was bed ridden for a month.

“Untitled” shows bright, colorful colors and free flowing patterns that represent the time I was bedridden. While in bed, I would reflect on things that I wanted to do but I couldn’t do because of my physical limitations. The things that I would reflect on represented happiness and freedom, which the patterns and col-

ors possess. By using digital tools, I was able to repeat patterns and change the colors to get my point across. When people view this piece, I want them to feel this sense of happiness and freedom that it represents to me.

## 28. Mitigating negative effects of a Criminal History

**Presenter:** Christopher Green

**Faculty Advisors:** Dr. Kelly Charlton  
Dr. Shilpa Regan

**Discipline:** *Psychology*

In an effort to determine a method of mitigating the negative effect of one's criminal history in a job interview, participants read about job applicants who disclosed or did not disclose a misdemeanor or felony criminal history during an initial interview. Results indicate that disclosure has a positive effect on personal evaluations and hiring assessments.

## 29. Wildflower Field Guide of the Nature Conservancy's Green Swamp Preserve

**Presenters:** Olivia Green  
Anna Sanford

**Faculty Advisor:** Dr. Rita Hagevik

**Discipline:** *Biology*

Conservation of wildflowers and native fauna is important to preserving the land's natural history. The Green Swamp, a Nature Conservancy preserve in Brunswick County, N.C., contains some of the best examples of longleaf pine savannas with a diverse understory that provides habitat for many rare orchids and carnivorous plants. The goal of this field guide is to introduce and educate others about this special and unique preserve. The field guide includes descriptions of longleaf pine savannas, pocosins, restoration pine plantations, wetlands, and ponds, along with the wildflowers found in or around each location. Extensive fieldwork was completed to collect the information for the field guide. Thus far photographs of more than 70 species of wildflowers have been taken at different times of the year. Using photographs of 58 species, we are in the process of collecting information about the species, including the North Carolina rare status, habitat, and the Native American ethnobotany. The icons are an illustration of the basic flower shapes, flower and leaf arrangements, and leaf types. The icons include head, branched, regular, spike, tubular, umbrella, compound, irregular, solitary, and rare. When completed, the field guide will contain approximately one hundred species of wildflowers organized by color. Each page of the book will contain an excerpt from literature, chosen by the Wild Women Book Club, a physical description of each flower, and a natural history section. Other sections of the field guide will describe the history of the Green Swamp, history of the Wild Women Book Club, legends, maps, fire ecology, and rare species conservation. This wildflower field guide's intent is to educate others on how to appreciate, preserve and protect the natural world around them.

### 30. The Role of Negative Feedback in Stabilizing Amplifiers

**Presenters:** Austin Griffin  
Robert Wardel

**Faculty Advisor:** Dr. William Brandon

**Discipline:** *Chemistry and Physics*

The purpose of this study is to gain an understanding of the role of negative feedback in the context of electronic amplifiers. A question of particular interest is why adding negative feedback to an amplifier makes it behave more linearly. We examine the question conceptually, mathematically and experimentally. Experiments done using both single transistor amplifiers and op-amps with various operating conditions and amounts of feedback are compared against a theoretical analysis. The study ends with how a better understanding of negative feedback in this context can be used for general problem solving and troubleshooting in designing systems of all types, amplifiers included.

### 31. Using Easy Java to Simulate the Behavior of a Frequency Modulated Mechanically-Driven Oscillator

**Presenter:** Luis Guadalupe

**Faculty Advisors:** Dr. Tom Dooling  
Dr. William Brandon

**Discipline:** *Chemistry and Physics*

In a pedagogical sense we aimed to create a lab that would introduce undergraduates to the Universal nature of oscillations. We began by briefly analyzing the universal theory of oscillations and the apparatus behind the mechanically driven oscillator. This experiment we carried out consists of a very simple set up which uses a Pasco 850 PC interface controlled by the Capstone software system. To carry out the procedure, a mass was driven by an oscillator that is swept over a small frequency range. We proceeded to create a simulation which would accurately model the experiment, thus eliminating the need to use the physical apparatus. Such a simulation was done possible by the use of Easy Java Simulations (EJS). The accuracy of the simulation was then tested by comparing the results of the physical experiment against the simulation data obtained from EJS using the values of the variables set by the physical experiment. The accuracy of the simulation is quite astonishing given the subtle nature of the transient effects resulting from "fast" sweep times we experimentally characterized.

### 32. Development of non-peptidyl small molecules for positive lysosomal modulation and protection against protein accumulation disorders

**Presenter:** Sarah Hafner

**Faculty Advisors:** Dr. Ben Bahr, Uzoma S. Ikonne, Marsalis Smith, Meagan L. Wisniewski, Dennis J. Hoover, Kishore Viswanathan, Heather Romine, and Dennis L. Wright

**Discipline:** *Biology and Chemistry*

A crucial function of lysosomes is the clearance of misfolded and aggregating proteins, however lysosomal function can become less effective due to effects of age, disease, and environmental stresses on neurological processes. The accumulation of misfolded and aggregate proteins has been linked to several neurological diseases including Alzheimer's disease, Parkinson's disease, and other dementias. Recent studies have demonstrated that lysosomal enzymes can be upregulated to compensate for neurological deficits in

proteolytic clearance that comprise risk factors for Alzheimer's and Parkinson's disease. Z-Phe-Ala-diazomethylketone (PADK) increases lysosomal cathepsin levels in the hippocampus and other brain regions, enhancing protective clearance of neurological aggregates including PHF-tau and A $\beta$ 42 (Buter et al. 2011, PLoS One; Bahr et al. 2012, Rejuvenation Res). Clearance of A $\beta$ 42 intercellularly was associated with plaque reduction in Alzheimer's disease transgenic mouse models and the corresponding amelioration of synaptic and behavioral deficits suggest that lysosomal enzyme enhancement provides protection at various stages in Alzheimer's disease development. From the successful PADK model, effective lysosomal modulators have been developed without the cathepsin inhibitory properties of PADK. Compounds SD1002 and SD1003 up-regulate levels of cathepsin B. SD1002 displayed improvement of effectiveness in lysosomal modulation, and offered protection against chloroquine-induced PHF-tau aggregation in hippocampal slice cultures, a model that exhibits excessive tau accumulation, microtubule alteration, transport failure, and compromise of synaptic integrity. The cathepsin B modulation by synthesized SD1002 isomers was determined to be stereo-selective. In addition, protection against Alzheimer's disease pathology was evident in a transgenic mouse model treated with SD1002. Development of cathepsin B modulatory agents will advance drug discovery in an effort to provide protection against protein accumulation pathology, such as Alzheimer's and Parkinson's diseases which disrupt synaptic integrity and lead to cognitive decline.

### 33. The Trophic Ecology of Invasive Fire Ants in Natural Ecosystems of North Carolina

**Presenter:** Betty Haughn

**Faculty Advisors:** Drs. Lisa Kelly  
Wm. Bruce Ezell  
Lee Phillips  
Steve Macko

**Discipline:** *Biology*

As a generalist consumer, the red imported fire ant (*Solenopsis invicta* Buren) may act as both a competitor and predator at multiple trophic positions. Further, the trophic ecology of this invasive species could change seasonally and in response to quantity and quality of food resources. In a pilot study, based on stable isotopes of carbon ( $^{13}\text{C}$ ) and nitrogen ( $^{15}\text{N}$ ), fire ants became more enriched in nitrogen from summer to autumn, and fire ants in disturbed sites occupied higher trophic positions than ants from nature preserves. To further test seasonal and environmental effects, we collected fire ants, non-ant arthropods and dominant vegetation in four nature preserves and in several disturbed sites (roadsides and green spaces in urbanized and developed areas) during summer and fall 2012. The nature preserves supported a rich fauna and flora, including rare species. Carbon and nitrogen isotopic ratios will be measured from dried, whole body samples of ants and non-ant arthropods and from representative plant tissues. We will estimate diets and trophic positions of fire ants by comparing isotopic ratios of fire ants, non-ant arthropods (herbivores, predators, and omnivores), and plants. Here we report on the taxa of plants and the taxa and trophic positions of the non-ant arthropods.

### 34. The Unknown and Overlooked: Addressing Rural Poverty through Student Volunteer Initiatives

**Presenters:** Danielle Holloway  
Shelby Newsome

**Faculty Advisor:** Ms. Christie Poteet

**Discipline:** *Community and Civic Engagement*

Located in rural North Carolina, UNC Pembroke is located in Robeson County, the poorest county in North Carolina with over 30% living below the poverty line. Research about rural poverty and services in these areas is scarce. This research project focused on rural poverty and ideas for helping students on college

campuses in rural areas, like UNC Pembroke, identify themselves as resources to populations in rural areas that are in need, but have limited access to available resources. Needs identified as potential areas for service included hunger/homelessness, career readiness, mentoring, environmental effects, advocacy, and literacy. College students in both rural and non-rural areas have the potential to become change agents and use the skills and opportunities they are afforded through attending a college or university to make a significant impact in these areas.

### 35. A Future Projection of Hardware, Software, and Market Trends of Tablet Computers

**Presenter:** Christopher Hudson

**Faculty Advisor:** Dr. Chuck Lillie

**Discipline:** *Mathematics and Computer Science*

This study investigated hardware and software trends in tablet computers released during the market explosion. Market explosion was defined by the release of 4+ devices in a fiscal quarter. Data was compared from a total of 82 tablet computers released between February 2011 and December 2012. Computers were analyzed on processor speed, weight, cost, battery life, and pixel density. Data was analyzed in accordance to the fiscal quarter. Results indicate the market trending toward a hybrid device between tablets and laptops.

### 36. Schindlers List: A Look at One of Cinematography's Most Prominent Portrayal of the Holocaust

**Presenter:** Mary Hunter

**Faculty Advisor:** Dr. Monika Brown

**Discipline:** *English and Theatre*

My seminar paper will be focusing on the novel *Schindler's Ark* by Thomas Keneally and its film adaptation, *Schindler's List*, directed and produced by Steven Spielberg, which is about a rehabilitated Nazi, Oskar Schindler, who saves 1,200 Jews from concentration camps. After doing some research on the film, I became intrigued with the background story surrounding its production and the difficulties that came with creating a film that held such importance and personal value to its director. Although Spielberg expressed interest and eventually persuaded Universal Pictures to buy the rights to the novel, it was many years before he felt that he could do the project. I think that such personal investment in the film would bring out the best results, because he would want to do the subject matter justice.

I want to look at how Spielberg accomplishes his interpretation of the story through his use of setting (location shooting), along with the way it is captured. I believe that the themes and historical contexts are more effectively depicted through Spielberg's directing methods, including the documentary style and the panning techniques of the camera. The many props and backdrops involved with the filming also help with pulling the viewer into the time period, possibly more effective than simply using one's imagination while reading the novel. Spielberg is said to have not wanted to embellish the events, filming it in black and white in order to make the date of filming indeterminate and create a movie that would portray a sort of timelessness about it.

37. The Effects of Herbicide on Terrestrial Arthropod Population Richness

**Presenter:** Saffie Jallow

**Faculty Advisor:** Mr. Jesse Rouse

**Discipline:** *Geology and Geography*

There are many methods used to manage resources pertaining to our natural environment, one in particular is the application of herbicides. Application of herbicides is used to remove and control unwanted plant populations during habitat restoration and ongoing maintenance. This particular method is used by resource managers throughout the United States as a management tool because of its capabilities to control invasive and unwanted cultural vegetation, its availability, and cost effectiveness. Though the hazards and effects of herbicides on humans are understood, a deemphasized concern is the effect it will have on terrestrial insect populations. There is not enough knowledge and information to provide an accurate answer to this concern. An answer can provide new ways to view, control, or even protect arthropods. This study is intended to be a comparative study that provides a better understanding of how different forms of vegetation management and removal, effect terrestrial arthropod population diversity (richness and abundance).

38. Achromatic and Color Stone Lithography after Daumier and Kollwitz

**Presenter:** Daniela Jimenez

**Faculty Advisor:** Mr. Brandon Sanderson

**Discipline:** *Art*

My research, along with the guidance of Professor Brandon Sanderson, was based on a study of traditional and contemporary lithography. It incorporated the use of limestone and grease pencils to generate prints. Lithography originated as a commercial printing process and is currently used to print newspapers and soda cans. It requires complex steps and precise chemistry to produce successful results. I used the historical lithographs of Daumier and Kollwitz as a starting point and replicated their techniques, mark making and artistic style to create our own. I used these techniques with both traditional stone lithography and then contemporary plate lithography.

39. Kenneth and Mamie Phipps Clark: Their Impact on the Study of Prejudice in Psychology and the Reduction of Prejudice in Society

**Presenters:** Melanie LaBeau  
Samantha Suggs

**Faculty Advisor:** Dr. Beverly King

**Discipline:** *Psychology*

This project focuses on Kenneth and Mamie Phipps Clark, two psychologists who had a profound influence on society, in general, and the discipline of psychology in particular. Specifically, the authors of this project will review the effect of their work on the desegregation of schools (through their input into the famous Brown versus Board of Education court case); as well as their revolutionary work with a methodology known as "the doll study." Information will be pulled from scholarly, peer-reviewed journals and books, especially those written by Kenneth and Mamie Clark. The resulting poster will bring to the attention of a new generation of students the important but often unknown work of Kenneth and Mamie Phipps Clark.

40. How Has the American Dream Changed Both Qualitatively and Quantitatively With Respect to Different Ethnic Groups?

**Presenters:** Robert Lamb  
Christopher Hudson

**Faculty Advisor:** Dr. Beverly King

**Discipline:** *Psychology*

Although economic decline is commonplace today, the American Dream (typically defined as the ability to increase one's economic success through hard work and leave one's posterity in a better place than they began) is still a thriving concept. Furthermore, immigrants today, over time, continue to develop an American identity and strive for economic successes. Although the American Dream is alive and well in many respects, it has changed in both quality and quantity with regards to its measurement in terms of spiritual satisfaction or material success, as well as to its quality in terms of who is able to achieve it and how easily it can be achieved. Using studies of polls conducted by various polling organizations over the past two decades we addressed a series of questions. One question that is emphasized in this study is whether or not ethnicity and hard work play a role in perceived access and achievability of the American dream. Other questions that have been addressed are whether the Dream can be achieved by everyone, how easily it can be achieved, and whether the Dream is about spiritual fulfillment or material success. After investigating the relevance of the belief in an American dream, we can conclude that while facing hard economic situations, the concept of the American dream remains strong among the American public even though the relative numbers of those that believe it to be achievable varies among demographic groups.

41. Optimization Conditions for the Biodiesel Production

**Presenters:** Robert Lamb  
Kara Beal  
Donella Hunt  
Christopher McKee

**Faculty Advisor:** Dr. Cornelia Tirla

**Discipline:** *Chemistry and Physics*

With the cost of petroleum-based fuels steadily rising, and a limited supply slowly dwindling, there is an ever-increasing push toward creating renewable, "green" sources of energy and fuel. The main goal of this project is to yield a cost-effective means of biodiesel production from alternative feedstock, such as used vegetable oil, without using corrosive catalysts such as potassium hydroxide. This goal is being pursued by testing the efficiency of two phase-transfer catalysts on the reaction: tetramethylammonium hydroxide (TMAH) and choline hydroxide. Optimization conditions are being determined for each catalyst's individual effect on reaction efficiency. These results are confirmed with NMR and GC spectroscopy. The immediate goal for this portion of the project is to determine whether a single catalyst or a combination of catalysts will produce a more efficient reaction.

42. Immobilization of Lactate Dehydrogenase

**Presenter:** Marvi Lim

**Faculty Advisor:** Dr. Siva Mandjiny

**Discipline:** *Chemistry and Physics*

Lactate dehydrogenase (LDH) is an enzyme responsible for converting pyruvate to lactate using NADH as a coenzyme, and is important in metabolic pathways. In our research, we are investigating the difference



between the reaction kinetics of free enzyme and immobilized enzyme. There are many techniques available to immobilize enzyme on various solid matrices either by chemisorption or by covalent coupling. We have adopted a novel technique of encapsulating this enzyme within calcium alginate gel beads. The advantage of this technique is to reuse the enzyme repeatedly. This could not be done with free enzyme. We have found out that the reaction is diffusion-limited, and thereby slower in comparison to the free enzyme.

#### 43. Factors Contributing to Student Learning Outcomes of Online Collaborative Projects

**Presenter:** Keri Locklear

**Faculty Advisor:** Dr. Melody Chuang

**Discipline:** *Educational Specialties*

In this digital era, online instructions are prevalent and students are expected to be competent in critical thinking, problem solving, collaboration, and communication skills for their success in the 21st Century (<http://www.p21.org/>; Trilling & Fadel, 2009). The study, "Factors Contributing to Student Learning Outcomes of Online Collaborative Projects", aspires to add the practical knowledge in equipping students for this current virtual age. This study examines the factors that contribute to students' learning outcomes from collaborative team projects in virtual courses. It is a continuation of our 2010 research project based on a guiding model of collaborative team learning (Johnson, Johnson, & Smith, 1998). The four hypotheses in this study are: 1) online students have a positive outlook on their collaborative team project when the instructor designs it to foster and support cooperative learning; 2) face-to-face meetings help the online students develop a sense of being part of a team; 3) the instructor's continuous feedback encourage online students to remain focused and work consistently with their peers to accomplish their goal; and 4) positive collaborative learning experiences help students build and develop team working strategies and skills and result in a quality group project. Qualitative research methods are used to analyze the data collected from the pre- and post- surveys on students' evaluations of their collaborative experiences of and attitudes toward online courses. Preliminary results, along with applications and recommendations for designing effective collaborative activities in online courses, will be presented.

#### 44. Y.O.L.O Beyond the Road

**Presenters:** Evan Long  
Dalton Hoffer

**Faculty Advisor:** Ms. Christie Poteet

**Discipline:** *Community and Civic Engagement*

Typically, student and Greek organizations that do not have a strong service focus find themselves limited to episodic service projects and miss out on opportunities to make a significant impact in their communities. This presentation informed and demonstrated to participants at the IMPACT Conference how to engage student organizations, like Greek organizations, in volunteer and service programs that have a stronger impact and go beyond roadside cleanups. Through research, best practices were identified and shared for engaging and working with student and Greek organizations by helping them to recognize their service potential through skill-based and mission-focused volunteer initiatives that are sustainable. Participants in the workshop were placed into groups that represent organizations that we would typically see on college campuses, i.e. SGA, Campus Activities, and Greek Organizations and worked together in small groups to brainstorm about what skills, talents, and knowledge might be found within these organizations and what service projects might best fit these groups. Overall, participants walked with ideas that can be easily implemented on their own campuses to fully engage student organizations in creating a campus-wide culture of service.

#### 45. Mentoring 101

**Presenters:** Ashley Lowery  
Alysia DeJesus  
Rose Locklear

**Faculty Advisor:** Ms. Christie Poteet

**Discipline:** *Community and Civic Engagement*

Research shows that mentoring has a significant positive impact on early indicators of dropping out of high school. In fact, programs that focus on and encourage mentoring showed that students who regularly meet with mentors are 52% less likely to skip a day of school. This project focused on providing tools for creating and managing a successful mentoring program, specifically those targeting at-risk youth. The project explored ways to become a successful mentor and best practices for working with diverse populations by providing a better understanding about the role of a mentor and becoming a change agent on campus and in the community by motivating and empowering youth.

#### 46. The Most Economical PC-Based Audio Laser Transmission and Reception Possible – Explained

**Presenter:** Austin Lowry

**Faculty Advisor:** Dr. William Brandon

**Discipline:** *Chemistry and Physics*

Understanding electro-optical phenomena is crucial to the development of modern instruments in many fields of science and engineering. Effective R&D involving electro-optics requires knowledge of p-n junction devices and PC-based electrical parameters so that efficient design principles can be economically integrated into new devices. Exploiting (hacking) ubiquitous devices is absolutely central in lowering the cost of any technology. In principle, such an approach can be extended to various physiological monitoring devices, and in turn, help mitigate expense in a variety of medical procedures. This project consists of the design and integration of a PC-driven laser diode transmitter and photodiode receiver. We have realized the simplest and most inexpensive, yet still high fidelity sound modulated laser possible. The final project has led to a commercially feasible, PC-driven, “fool-proofed” sound modulated laser device that would cost less than ten dollars per unit to manufacture.

## Poster / Exhibit Session – Afternoon

### 1. Aquaponics: Bringing Two Green Ideas Together

**Presenters:** Lloyd Mack  
Davon Goodwin  
Andrew Sutton

**Faculty Advisors:** Dr. Deborah Hanmer  
Dr. Patricia Sellers

**Discipline:** *Biology*

This study of Aquaponics combines hydroponics; the method of growing plants in nutrient rich water without the use of soil and aquaculture; the science of cultivating aquatic organisms together. This process creates a sustainable method for growing fish and providing an environmentally friendly means to produce vegetables without the addition of harmful toxic chemicals. The Aquaponic media based system uses expanded clay pellets and lava rocks (in place of soil), two 175 gallon water tanks, two 175 gallon plant beds, a bio-filtration system, a sump pump system, 21 Hawaiian gold tilapia (*Oreochromis mossambicus*), 100 lettuce plant seeds, all sustained within a temperature regulated greenhouse. A baseline/control to create optimum growth conditions for the fish and plants will be established. The levels of nitrate, nitrite, ammonia, phosphorus, chlorine, pH, and oxygen will be documented. The size, weight, and length of the fish will be recorded. Untreated lettuce (*Lactuca sativa*) will be used as the vegetable in this study. After eight weeks, the fresh weight, dry weight, root mass, and root shoot ratio of the plants will be documented.

### 2. Works by Emmanuel Manolukas:

**Presenter:** Emmanuel Manolukas

**Faculty Advisor:** Mr. Brandon Sanderson

**Discipline:** *Art*

Printmaking and the Student – “Survival 2”

Before pursuing art my chief academic interests were biology and drafting; as such much of my artwork reflects these interests by incorporating elements of biological illustration and mechanical schematics. In the print “Survival 2” I explore the relationship of how nature and man adapt due to changing environments. I present these ideas in a format that emphasizes the scientific and mechanical elements of that relationship. The underlying theme of the piece deals with my own adaptation due to changes in environment.

Printmaking and the Student – “Memoriam”

In this print I explore the idea of memory and our perception of it. I do so by juxtaposing elements of mechanical memory, the camera; versus the natural, the eye. The idea is that while an eye and a camera work in very similar ways the end result can be very different. While a photograph captures a static moment in time that never changes, a memory captured via the human eye can alter its own memory and can be variable based on the viewer’s perception of the event.

## The Artistic Method

This box acts as a physical self-portrait of my mind and the basic thought process it undergoes when I attempt to create a work of art. Similar to the Scientific method, each panel represents a specific thought or step in the process and must be followed in a specific order. Also the placement of each image on the box is carefully planned out in a way that reflects metaphorical representation of how these thoughts manifest in my mind.

### 3. School Desegregation

**Presenters:** Scotty McCormick  
Christopher Cheek  
Charles Hunt  
Michael Hardison

**Faculty Advisor:** Dr. Jaime Martinez

**Discipline:** *History*

Our group is studying the relationship between Civil Rights and Education, and our research has centered around on question: Did African Americans, as well as other minorities, view school desegregation as an advantage or disadvantage during the late 1960s and 1970s? The most common interpretations of this topic argue that many African-Americans considered desegregation to be an advantage because it increased the quality of education that their children received. Also, the school facilities were a lot better. A couple of disadvantages were that some of the children felt intimidated by going to white schools, and the fact that desegregation often involved busing. We are testing this interpretation by examining resources like newspaper articles, movies, and school records, especially from Robeson County. Also, we will be conducting interviews with African Americans, Caucasians, and Native Americans to understand their perspective about this subject matter. We predict that by examining actual statistics such as grade increase or decreases, the percentage of African-American high school graduations and dropouts, and African-American college attendance, we can determine the significance of desegregation as disadvantage or advantage.

### 4. Interpretation of Road Segments and Addressing Issues

**Presenters:** Anthony McLellan

**Faculty Advisor:** Mr. Jesse Rouse

**Discipline:** *Geology and Geography*

An address range is used by a GIS locator to assign potential address points from one road segment to another. When the ranges are not correct the locator can place address points, but not in the correct spot. The most effective solution to the problem is to go out to each road segment, collect the correct ranges and make necessary changes in the database. Field work is important for this project because it is impossible to look at orthoimagery and be positive that what you are looking at is correct. Our approach has been to make maps of existing county data and go into the field to check the ranges to find the appropriate corrections to make in the database. Once all of the ranges within the city limits are correct we will build a locator that more accurately represents the address blocks of Lumberton.

## 5. Voting Rights

**Presenter:** James McLellan

**Faculty Advisor:** Dr. Jaime Martinez

**Discipline:** *History*

I am studying how race and social class affect voting rights. Some scholars argue that voting policies enacted since the 1980s have made it more difficult for poor people and minorities to vote. These laws focus on redistricting and voter identification. The redistricting laws have to do with race, proportionality, and number of people in a district. The Voter ID laws require people to have the proper identification to be able to vote. I am testing this interpretation by looking at articles from League of Women Voters, NAACP, and other primary sources like local and regional newspapers. My hypothesis is that no matter how much we try to make voting equal it will never happen due to the Legislators. They are the ones who make the laws. Just like the Voter ID law which is supposed to suppress poor people votes make it harder for them to vote. The Legislators do that so they can keep their seats. We need to explore this question in depth because most Americans believe that if you work hard and follow the law all your life you have the right to vote, but these restrictions make that almost impossible for some Americans to do.

## 6. Stereotyping of Women in Primetime Basic Cable Television Shows

**Presenter:** Karen Menzel

**Faculty Advisor:** Dr. Judy Curtis

**Discipline:** *Mass Communications*

Women are constantly being stereotyped in society. Even with all of the strides that women have made throughout the years they are still stereotyped even on television shows. This research looks into three different television networks and one show from each network. Each show was view two times and focused on the main female character of that show. The researcher's purpose is to show that women are still stereotyped into certain roles that society thinks they should be in. Whether a doctor, lawyer, detective, or any other character, the women on these shows still are portrayed as what society thinks they should be. Each female character viewed for the research was found to be independent; she was not married, had her own job, and provided for herself.

## 7. Engaging North Carolina's American Indian Youth with Microgravity Science

**Presenters:** Alejandra Mitchell  
Candace Langston

**Faculty Advisor:** Dr. Timothy Ritter  
Dr. Siva Mandjiny

**Discipline:** *Chemistry and Physics*

NASA's Reduced Gravity Student Flight Opportunities Program provides select undergraduate students a chance to participate in a unique research opportunity. The program allows teams to conduct their own research in varying gravitational fields by proposing, designing, fabricating, and flying reduced-gravity experiments aboard NASA's "weightless wonder", a microgravity research aircraft. Participation in this program also requires the research team to conduct a public outreach program. Our outreach presentation introduces the audience to NASA's student flight program, discusses gravity, explains weightlessness, and describes the scientific research that will be conducted by the team. Historically, our outreach focus has been on disadvantaged individuals, particularly American Indian youth, as we are located in the heart of the Lumbee Tribe. Each year the team performs two experiments; one for our research and one for the outreach program. This year's scientific research explores the effects of microgravity on the Cori Cycle, a natural reaction during anaerobic glycolysis, the process by which skeletal muscles acquire energy during short bouts of intense exercise. Our outreach experiment will demonstrate the effects of gravity on a

bursting water balloon. In 1-g, gravity will pull the water inside the balloon toward the ground, but in 0-g the lack of gravity will allow the water to maintain the shape of the balloon. By doing this experiment in the unique laboratory provided by NASA's 0-g aircraft, we hope to excite and inspire the next generation of scientists.

#### 8. The Civil Rights, Through their Eyes

**Presenters:** Samantha Morgan  
Victoria Newkirk

**Faculty Advisor:** Dr. Jeff Frederick

**Discipline:** *History*

The way individuals experienced and internalized the Civil Rights Movement varies regionally, racially, and by gender. This research focuses on the various ways that people experienced the movement and how their perceptions of the movement are reflected in today's society. It is particularly noteworthy that some who lived through the movement choose to transmit their experiences to family members while others do not. Four individuals from diverse backgrounds were interviewed, revealing that each individual remembered the unfolding drama of the Civil Rights Movement differently, and that each held different ideas about the movement's influence on contemporary society. This project sheds light onto how personal interpretations of events (memory) differ -- often markedly-- from traditional and academic narratives (history). It also raises other critical questions: are today's students interested in learning about the Civil Rights Movement? Will the story of the movement continue to recede in informal settings? Is the movement less powerful than a generation ago?

#### 9. Moments Forever Held

**Presenter:** Melvin Morris

**Faculty Advisor:** Ms. Carla Rokes

**Discipline:** *Art*

Creating works of art that represent time can be accomplished in a variety of ways. In this drawing my intention was to use an obvious symbol, seen in everyday life, which represents time. Time is something that I've learned to appreciate and if you're not mindful of time it can go by "in the blink of an eye." Using the clock as the dominant figure to represent time in this composition, allows me to convey my thoughts as I attempt to portray an interpretive message of life through this particular symbol. The media choice was graphite, prisma color and digital print. Through the exploration of various media I selected these materials because I feel it was one of the most effective ways for me to demonstrate dynamic value within the composition. This was also another opportunity for me to use media that I've never used before.

#### 10. Microgravity Effects on the Cori Cycle

**Presenters:** Molly Musselwhite  
Tiffany Scott

**Faculty Advisor:** Dr. Tim Ritter

**Discipline:** *Chemistry and Physics*

With increased explorations into the outer realms of space, astronauts are put under new and unexplored stresses. Although there has been significant research conducted to investigate the effects of microgravity on many human biological mechanisms, there has been very little research conducted to better understand the effects of microgravity on the Cori cycle. The Cori cycle is responsible for the conversion of lactic

acid in the muscle to pyruvate by way of the liver, which causes the production of the Adenosine Triphosphate (ATP). ATP is used by muscle cells as an energy source for muscular contraction during muscular activity. We will observe the reaction between Pyruvate and Nicotinamide Adenine Dinucleotide (NADH) in the presence of Lactate Dehydrogenase (LDH) to form Lactate and NAD<sup>+</sup>. Preliminary 1-g measurements of the reaction have been conducted in the laboratory and will be compared to measurements made in 0-g on board NASA's microgravity research aircraft. Our hypothesis is that in 0-g the conversion rate of pyruvate to lactate will lower, leading to weakened muscles. The microgravity data collected will be taken as part of NASA's Microgravity University Program. This highly competitive program provides select undergraduate students the opportunity to fly experiments on their "0-g" aircraft. The team will travel to Houston, Texas in May 2013 to conduct our experiment on board NASA's microgravity research aircraft. We present the current status of our investigation as well as future plans.

#### 11. The PVC Transonic Wind Cannon

**Presenters:** Andrew Neal  
Frederick Schirmer

**Faculty Advisor:** Dr. William Brandon

**Discipline:** *Chemistry and Physics*

A vacuum cannon, sometimes referred to as a vacuum bazooka, makes for an impressive demonstration of air pressure. Typically a ping pong ball is loaded into a 1–2 m length of PVC pipe, which is outfitted with a valve that is connected to a vacuum pump. The ends of the pipe are then sealed with aluminum foil or plastic tape and the pipe is evacuated to a low pressure. When the seal nearest the ping pong ball is ruptured, the projectile is forced out of the far end of the pipe by the inflow of air at atmospheric pressure. The projectile exits the end of the tube sealed by aluminum foil at an astonishingly high velocity. In previous experiments, the speed of the projectile reached on average 200 m/s. Here we describe the design and construction of a transonic wind cannon modeled loosely from an existing version constructed at Purdue University. In this version a separate chamber will be placed behind the vacuum tube and connected via reduction couplers to provide a chamber for pressurized air. This setup is used in order to produce a greater pressure difference resulting in a faster flow of air into the vacuum chamber and hence a higher muzzle velocity. The apparatus should be capable of reaching velocities that exceed the speed of sound (~340 m/s). Once completed, we will attempt to measure the muzzle velocity with a custom made photogate system and report on its overall performance.

#### 12. Gender Roles within the African American Family

**Presenters:** David Paddock  
Brandi Burnside

**Faculty Advisor:** Dr. Jaime Martinez

**Discipline:** *History*

Our group is studying familial relationships among African Americans in the late 20th century. The most common interpretations of this topic address three separate points. The first point is the statistical lack of a stable two parent home within the black community as compared to society overall. Additionally, scholars have stated that some black men are unsure of their ability to provide for a family and thus abstain from marriage. This is generally referred to as the Cinderella Complex and Prince Charming Ideal. Finally, there are numerous studies that show the employment and community based difficulties faced by interracial couples, with emphasis on black male / white female partnerships. We are testing these interpretations by finding relevant data such as statistics, journal articles, and primary sources that can prove these interpretations are reliable and factual. Thus far we have found reputable newspaper articles such as those from the New York Times, The Charlotte Observer, and the Atlanta Journal-Constitution. There are also television shows such as the Cosby Show that, while fictional, show the dynamic of the ideal family structure that we will compare to the average family life within the African American community.

Our current hypothesis is that due to the Cinderella Complex, there is excess pressure on black males to properly provide for their families, whether interracial or not. This leads to fewer marriages, in order to avoid that responsibility, resulting in the fact that a black child is more likely to live in a single parent household without a positive male role model.

### 13. Hip-Hop's Influence on African American Culture and Communities

**Presenters:** Thad Pearson  
Kelly Minton  
Nixon Thomas

**Faculty Advisor:** Dr. Jaime Martinez

**Discipline:** *History*

We are exploring why Hip-hop has been influential in the African American community. In particular we believe it helped blacks cope with their second-class citizenship through lyrical metaphors. Often, hip-hop and rap are correlated with the ideals of defiance and aggression in post-civil rights movement America. In order to determine the validity of this interpretation, we will study interviews, music lyrics and memoirs; that will allow us to dissect the metaphors of rap as well as its effect on the African American Culture. Our source list will include people like hip-hop legend Tupac Shakur, who said "the way our society is working now, only negative images of the black community are portrayed worldwide" (McCune 122). Our preliminary thesis is not that blacks were viewed as positive or negative but rather that blacks began to view hip hop as their voice and that is why foundational artist and the earliest hip hop lyrics were so important in shaping the African American culture. By examining their lyrics, lifestyle and imagery we hope to develop a strong sense of the subject matter of hip-hop and what made their subjects so relevant in the black community. This project is significant because hip-hop shapes how the African American community is perceived today as well as the ideals of blackness within the African American ethnic group.

### 14. Enhancing the Local Food System: A Survey of Robeson County Farmers

**Presenters:** Valery Quinones  
Spencer Thomas  
Scott Tyson  
Jeffrey Cooper

**Faculty Advisor:** Dr. Brooke Kelly

**Discipline:** *Sociology*

The Local Food Connections in Robeson County research project is working towards establishing a local food system in order to meet local needs and develop a better economy and healthier population. This research project is in partnership with the Center for Community Action (CCA) in Lumberton, NC, UNCP's sustainable agriculture certificate program, and NCSU agricultural extension for Robeson County. In order to target those who are low income and/or food insecure, the research project focuses on understanding the needs of small scale local farmers. Our ultimate goal is to increase the amount of sustainably produced food in our region, create opportunities for the enhancement of low income and limited resource small scale farmers, and recommend, based on our findings, ways to establish a value-based food supply chain. A mixed methods farmer's survey was developed and administered to thirty farmers in Robeson County. The farmers were interviewed, interviews were audio recorded then transcribed. Quantitative data were entered into an excel spreadsheet and later analyzed with geo-mapping software. A qualitative data analysis program was used to examine the transcripts by noting themes such as challenges farmers face. The data collection and mapping is only the beginning of a larger effort to promote local foods.



## 15. North Carolina Art Education Association Conference: Frogman's Workshop Presentation

**Presenter:** Lindsay Roberts

**Faculty Advisor:** Dr. Tulla Lightfoot

**Discipline:** *Art*

In July of 2012, I had a great opportunity to go to the Frogman's Art Workshop. While I was there, I was able to learn new processes of printmaking, see contemporary works of art, and interact with printmaking professors and students. At the Art Education Conference in Asheville North Carolina in November 2012, I was able to speak with art educators about my Frogman's workshop experience. During my presentation, I gave a powerpoint about my trip to Frogman's. The powerpoint included pictures that I took while I was at the workshop. With the images, I talked in depth about the workshops and the many printmaking processes and techniques I learned there. I will also speak about the fun activities offered at Frogman's such as the open portfolio and bowling night.

## 16. Lights

**Presenter:** Lindsay Roberts

**Faculty Advisor:** Mr. Brandon Sanderson

**Discipline:** *Art*

The lithograph *Lights* is inspired from a song titled "Lights" by Ellie Goulding. In Goulding's song she describes her fear of darkness before falling asleep as a child. She reinforces this fear by repeating her longing for lights. This concept is illustrated by the sleeping figure and the illuminated heads drifting into the window. The heads reflect a line from her song "Cause they're calling me home". The heads are making an appearance in the sleeper's dreams to reassure her that she is safe.

Sleep is a topic that fascinated me because it is a partnership of reality with the unreal. When we are asleep our bodies are fully present to the world, but our minds are in an imaginary state. The figure along with the mass of heads reflects this idea. The female is present in the image, while the illuminated heads are the subconscious mind of the figure.

## 17. The Graphic Story of Gilbert Patterson

**Presenter:** Lindsay Roberts

**Faculty Advisor:** Mr. Brandon Sanderson

**Discipline:** *Art*

Gilbert Patterson was a Scottish settler in the 18th century who found refuge on the banks of the Cape Fear River after his canoe crashed into a bolder. The area of his refuge later became known as Raven Rock State Park in Lillington, North Carolina. My work includes a comprehensive series of illustrations about Patterson's accident through his rescue home by Native Americans. The story has a personal and historical significance to me because I am from Lillington and the story has ties to my heritage. The story has personal significance to me as a student because of my research before producing the imagery, the learning process in creating the imagery through printmaking, and including my prints in the Coming Home National Print Exchange at the University of Alabama. The story has a historical significance to the University because of its underlying meaning of positive interaction between Native Americans and European Settlers.

## 18. Involuntary Perceptions: Do Emotional Television Ads Influence Subsequent Judgments?

**Presenters:** Matthew Sadler

**Faculty Advisor:** Mr. Nicholas Freeman

**Discipline:** *Psychology*

In a world where so many media sources are competing for our attention, even simple television commercials are often designed to elicit emotional reactions. Although these commercials seem benign, is it possible for the emotions they elicit to carryover as the television rapidly cuts to something more important? Prior research suggests that emotions generated by one experience can affect the perception and judgment of subsequent experiences. Based upon this idea, the current research aimed to test whether the emotions aroused by television commercials carryover and influence perceptions about important news stories.

Participants in this study were randomly assigned to one of three groups. Participants in two of the groups first watched a brief television advertisement whereas participants in the remaining group did not watch any advertisement. The two groups that watched a television advertisement saw commercials intended to elicit either the emotion of fear or disgust. After either watching or not watching one of the advertisements, all participants were shown a television news broadcast discussing a gay marriage amendment passing in New York State. After watching the broadcast, participant's attitudes and feelings towards gay marriage and homosexuality were measured through the use of questionnaires to determine whether or not the advertisements influenced their perceptions about the topic discussed in the broadcast.

Results indicated that participants who viewed an emotional television commercial prior to watching the news broadcast did not express different perceptions about gay marriage or homosexuality than participants who did not first view a commercial. Indeed, statistical tests did not reveal any meaningful differences amongst the groups. This suggests that although previous research has found that emotions related to one experience can affect the judgment of other experiences, this does not appear to be the case with television advertisements.

## 19. Empathy in the Abused Child

**Presenter:** Mariah Sampson

**Faculty Advisor:** Dr. Melanie Hoy

**Discipline:** *Psychology*

Research suggests that abuse affects development of children in profound ways. Emotion development is one area that has been studied in abused children, and research has found that if children have been abused they show lower levels of empathy. However, research has not widely investigated factors related to the abusive situations which may affect these developmental trends. The researchers in this experiment hypothesize that children who experienced abuse at an earlier age were less likely to express empathy in scenarios that usually elicit it, compared to children who were abused at older ages. To examine this research area, we will interview adolescents who have been abused and ask about their personal level of empathy. After this interview, we will read a section in a holocaust book about a young boy's experience and ask them questions about the story and also their level of empathy. We will follow up with an interpersonal reactivity test. This research expands on what psychology already knows about the psyche of an abused child in the hopes of healing their trauma.

20. Comparison of Grain Size Analysis Techniques for Classification of Rim Sands from the Jones Lake Carolina Bay

**Presenter:** Anna Sanford

**Faculty Advisor:** Dr. Lee Phillips

**Discipline:** *Geology and Geography*

Grain size analysis is essential to the understanding of grain size distribution and interpretation of sedimentary environments. This phase of our research is focused on describing the grain size characteristics of Carolina Bay rim sands from Jones Lake in Bladen County North Carolina and comparing four techniques for assessing variations of their textural characteristics. Jones Lake is a prominent Carolina Bay that continues to support a bay lake near its center. Rim sands are most pervasive along the eastern margin and have been sculpted by lacustrine and eolian processes. Three pits were excavated within the eastern rim of the Jones Lake Carolina Bay, which lies within the Bladen Lakes State Forest. Samples were collected at regular intervals from each pit and splits were taken for grain size determination by each of the following procedures: 1) standard sieve analysis at 1 phi interval as agitated by hand; 2) standard sieve analysis at .5 interval as agitated by a sieve shaker; 3) unprocessed sample splits were analyzed using a Beckman Coulter Counter System; and 4) reanalysis using the Beckman Coulter Counter System after the sample splits were processed using a bleach bath to remove organic materials. Raw data were processed using GRADISTAT, which rapidly calculates grain size statistics using Folk and Ward graphical methods. A comparison of results allows us to determine protocol for grain size assessment of rim sands in the Jones Lake Carolina Bay study area and, possibly, most Carolina Bays within the region.

21. Plankton Diveristy of Krinshaw Pond

**Presenters:** Anna Sanford

**Faculty Advisors:** Dr. Patricia Sellers

**Discipline:** *Biology*

A survey of the plankton in Krinshaw Pond (Hamlet, NC) was conducted in the Fall of 2012. Plankton nets were towed just below the surface of the pond during 15 sampling events. Four genera of the cladocerans and two of the copepods were among the zooplankton identified. Thirty-five genera were among the phytoplankton identified. Most species were imaged using a digital camera attached to a light microscope. This presentation will display lists and proportions of genera, many of which will be accompanied by photographs. This presentation exposes the biodiversity of the plankton in Krinshaw Pond. Featured will be *Chydorus bicornutus*, a cladoceran that has not been reported for the southeast and is presumed to be restricted to more northern latitudes.

22. Racism in the Classroom as it Relates to Academic Success

**Presenter:** Ethan Sanford

**Faculty Advisor:** Dr. Beverly King

**Discipline:** *Psychology*

Ever since Rosenthal's research on what he called "the Pygmalion effect," classroom bias has been an important topic of discussion in the fields of both psychology and education. This project examines Rosenthal's study and similar studies by prominent educators and psychologists in order to answer questions such as the following: Do teachers hold more negative attitudes toward some children than toward others? Do negative teacher expectations influence students' self-esteem and perceptions of self-

worth? Is there a correlation between perceived self-worth and academic achievement? After summarizing the literature in the area of classroom bias and its impact on children, implications for educators will be discussed and recommendations made for teacher training.

### 23. Kenneth and Mamie Phipps Clark Doll Studies

**Presenter:** Kimberley Scales

**Faculty Advisor:** Dr. Beverly King

**Discipline:** *Psychology*

Kenneth Clark and his wife, Mamie Clark, are famous for developing the “doll-technique” to identify racial perception and identification among young children. Participants in the doll studies were young children who were asked a series of questions regarding two plastic dolls, one white, and one black, which were placed in front of them. The participants were asked various questions such as: Which is the nice doll? Which doll looks most like you? Which is the good doll? The Clarks' research played an important role in the monumental Supreme Court case, *Brown vs. Board of Education*, which ended segregation in American Public Schools. This poster presentation provides an in-depth analysis of the doll study methodology, and results of the studies using this methodology. The ultimate goal of this presentation is to describe details of the “doll-technique” and discuss limitations and problems associated with its use.

### 24. The Effects of Resisting Cell Phone Use on Future Self-Control Ability

**Presenter:** Anna Schweitzer

**Faculty Advisor:** Mr. Nicholas Freeman

**Discipline:** *Psychology*

In today's world, cell phones are everywhere. Indeed, many people use their cell phones while driving, in meetings, in classrooms, and even during face-to-face conversations. Certainly people may be distracted while actually using their cell phone, but is it possible that merely resisting the urge to use one's cell phone might have negative consequences? Research suggests that the ability to exert self-control is governed by a limited resource and that all acts of self-control use up or deplete the resource, making subsequent acts of self-control less likely to succeed. In the current research, we tested whether participants who resisted the temptation to use their cell phone would suffer negative repercussions on a subsequent self-control task.

Sixty participants were randomly assigned to one of three conditions. Specifically participants were asked to think about, but not touch, either 1) their cell phone that was placed on the table in front of them, 2) their cell phone that was kept out of sight in their pocket, or 3) a calculator that was placed on the table in front of them. Following this, all participants were asked to solve several anagrams, one of which was unsolvable. We predicted that compared to participants who resisted using a calculator, participants who resisted using their cell phones would persist for less time on the unsolvable anagram, an indication that their self-control resources were depleted. However, ANOVA analyses of the data indicated that there were no significant differences in persistence among the three groups. Even among participants who reported being “somewhat addicted” to their cell phones, there were no significant differences. These findings suggest that merely looking at a cell phone without using it does not present a temptation strong enough to actually deplete self-control strength.

## 25. Mimicry

**Presenter:** Kayla Seedig

**Faculty Advisor:** Ms. Carla Rokes

**Discipline:** *Art*

The mediums used are watercolor, prisma colored pencils, graphite, alcohol, and watersoluble marker. When creating this piece, I had in mind the similarities, differences, and mutualistic qualities birds and humans share and do not share. Humans consider themselves a higher being due to their intelligence and abilities to perform complex tasks and problem solving skills. However, our survival skills and natural physical abilities are not up to par compared to animals. A bird's natural instincts to survive are more effective than human's and humans are unable to fly, though we try to mimic nature by making flying machines.

Mimicry represents an unattainable ability that birds are naturally born with and humans are not. However, humans attempt to recreate this ability by looking to birds and seeing how their anatomy allows flight and creating airplanes with wings, just as birds have. The colors of the robin are repeated in the plane to emphasize the mimicry.

Mimicry is meant to be seen from an underside view while flying with the bird and plane. The plane and bird create strong diagonals to create a sense of direction, while the outstretched wings of the bird and plane help create movement within the piece. The plane mimics the color and shape of the bird and creates repetition. The warm clouds behind the figures create consistency since the colors of the figures are also warm. Some humans take nature for granted and often mistreat it, but we rely on nature so much for inspiration to create things that allow us to do incredible things, like flight. So why are we superior when nature is what creates us and gives us so much?

## 26. Unattainable Expectations

**Presenter:** Kayla Seedig

**Faculty Advisor:** Ms. Carla Rokes

**Discipline:** *Art*

The mediums I used are acrylic inks, graphite, india ink, and graphatint. My piece was inspired by the unrealistic expectations that society places on women, especially while growing up. Young women are impressionable and are constantly bombarded with unrealistic and double standard ideals that include refraining from sex, standing up for themselves, being thin, and having the ideal features that the media displays. So, I created this work to emphasize the frustration and pressure that I and many other young women felt growing up and still deal with. I used the india ink to trap the figure and create a sense of asphyxiation between the figure and background. There is transferred text within the border that state some of the expectations that women experience to reinforce the black boarder that encloses the figure. The figure's expression is frustrated, her hair is messy, and her body is made up of cool graphatint colors to represent how she feels on the inside. However, she sits upon a warm cloud that represents how women are expected to be, which is cheery, obedient, and feminine. Placed on top of the warm cloud of expectations are dead flowers, which represents that these standards are not possible. The ink border with text hidden draws the viewer in and creates focus for the figure. The warm and cool colors create contrast and the dark undergarments of the figure, which is actually a text pattern I made digitally, force the viewer to look at those articles of clothing that are not widely accepted outside of the bedroom. I mainly used contour lines in this piece, but used graphatint pencils that create the values of the figure. The forms of the woman are repeated within the cloud and the outline of the cloud to create repetition within the composition.

27. The Distribution of *Solenopsis invicta* Colony Genotypes in the Coastal Plain of North Carolina

**Presenters:** Mycah Sewell and Nigel Hirth

**Faculty Advisor:** Dr. Jermeay Sellers

**Discipline:** *Biology*

The red imported fire ant (*Solenopsis invicta*) exhibits two distinct social forms: polygyne, multi-queen, and monogyne, single-queen colonies. On a genetic level, polygyne and monogyne colonies can be distinguished from one another by examining their genotype with regard to alleles of the Gp-9 gene. Members of monogyne colonies are homozygous for the Gp-9B allele, while members of polygyne colonies are heterozygous, bearing a Gp-9B and a Gp-9b allele. The goal of this survey is to compare the distribution of the two social forms in disturbed and natural environments of the NC Coastal Plain. Disturbed environments are characterized by evidence of significant human activity, including pesticide use. Natural environments are those that have not been significantly impacted by recent human activity. In particular, we wish to explore whether proximity of pesticide use affects the distribution of the two social forms. For this, an allele specific multiplex PCR assay was applied to DNA samples of multiple colonies from disturbed and natural locations. Colony genotype was then determined by analyzing the electrophoretic mobility of the PCR amplified products on agarose gels. Based on the number of visible bands from each sample in the gel, the genotype of each colony surveyed was determined to be either polygyne or monogyne. Conclusions drawn from this survey about human impact on fire ant colonies can be used to develop better techniques and strategies for pest population control and possibly decrease the use of pesticides if gene regulation were included in new population control techniques.

28. Demon face and Piranha Plant

**Presenter:** Matthew Sharp

**Faculty Advisor:** Mr. Brandson Sanderson

**Discipline:** *Art*

My art is often guided by my interests in pop culture and an introspective look at myself. I commonly modify imagery borrowed from video games and animated films to express an interest in and recognition of themes that I related to. At times my art serves as a representation of self as I recreate myself as hero or villain. In other cases, I have fabricated sculpture that serve as life size incarnations of characters that have before only existed in games, cartoons, and fantasy. The formal elements in my work are subject to the elements and background of the character that choose to depict in a graphic and sometimes visceral manner.

29. "It was just a joke..."

**Presenter:** Marcus Sherman

**Faculty Advisor:** Dr. Beverly King

**Discipline:** *Psychology*

This poster addresses the relationship of pervasive sexist humor and gender prejudice, through literature review. Research indicates that exposure to sexist humor provokes a release of gender prejudice through the perpetuation of a tolerable level of objectification, devaluation, and violence towards females based on perceived social norms. The findings posit that as sexist humor becomes a norm, the social majority is enabled to allow, encourage, and enforce the proliferation of gender prejudice.

30. A Model of Brain Damage to Study Early and Delayed Responses with Focused Transcriptomics: Identifying Opposing Roles of the Transcription Factor NF-kB

**Presenters:** Jordan Smink

**Faculty Advisor:** Dr. Ben Bahr  
Ebru Caba, Robert C. Elliott  
Heather Romine, Hsin-wei Wang,  
Charles Giardina, Don-Guk Shin

**Discipline:** *Biology / Chemistry*

Stroke and traumatic brain injuries activate both degenerative and protective pathways in vulnerable brain regions. Damaging effects resulting from brain injury stem from an equation of induced pathogenic pathways and compensatory pathways. N-methyl-D-aspartate (NMDA) exposure was used to mimic over activation of NMDA type glutamate receptors that occurs in a stroke in order to observe early and delayed gene response. Experiments using hippocampal slice cultures were maintained in culture eliminating problematic systemic variables. Total RNA was isolated 1 and 24 h post exposure for comparison to control hippocampal slices using Affymetrix neurobiology-focused arrays. To confirm the identification of opposing pathways that converge on a single response element, NF-kB activation was blocked since this transcription factor is implicated to have dual roles in survival and cell death (Perkins, Trends Biochem Sci, 25, 434-440, 2000). Cultures were exposed to NMDA causing excitotoxicity, in the presence or absence of NF-kB inhibitor. This approach led to the identification of opposed signaling networks involving the biphasic activation of NF-kB. Genes were assessed for whether its promoter has a binding site for NF-kB. Only two genes expressed opposing biphasic responses: early response factor-1 (Egr-1) and the neuron-derived orphan receptor-1 (NOR-1), both transcription factors. NF-kB does not appear to be involved in early induction of Egr-1 and NOR-1. Unexpectedly, down regulation was blocked or reversed. Pathway analyses are being conducted to explain this unexpected result. Learning what dictates the pro-survival vs. pro-death actions of NF-kB could lead to novel insight into possible avenues of therapy after excitotoxicity.

31. Effect of Prescribed Fire on Overwintering Terrapene Carolina

**Presenters:** Jordan Smink, Kristoffer Wild

**Faculty Advisor:** Dr. John Roe

**Discipline:** *Biology*

As the only terrestrial turtle species found in North Carolina there is a keen interest in maintaining and growing the population of NC's state reptile. Eastern Box Turtles, *Terrapene carolina*, are slow growing and yield few young making turtle populations especially susceptible to population decline as a direct or indirect effect of human activities. Prescribed fire is a common management practice employed in much of the range of *T. carolina* in the southeastern United States. To develop effective conservation strategies it is important to understand their behavioral responses to fire. In particular, we are studying the effects of prescribed fire on overwintering microhabitat selection behavior of turtles in the North Carolina Sandhills. As turtles may be especially vulnerable to fire at this critical time of year when their movement responses are severely impaired, we expect them to associate with habitat features that confer some protection against fire. We located the overwintering locations of turtles using radio telemetry in the Weymouth Woods Nature Preserve, where controlled fire is used to manage the understory of the Long Leaf Pine forest, and the Lumber River State Park, where fire is not used. Turtles at both sites reduced activity throughout October and November, and finally settled into overwintering locations by early December. Turtles at both sites moved into lowland habitats near water for overwintering, and we are in the process of collecting microhabitat environmental variables. Understanding how fire impacts the availability and distribution of suitable overwintering habitat for terrestrial turtles will yield insight into the effects of fire on non-target species, and thus help improve management for this species of conservation concern.

32. Lysosome modulators reduce behavioral deficits in hAPP mouse models as well as in the Fischer rat model of age-related cognitive decline

**Presenters:** Marsalis Smith  
Sarah Hafner  
Armando Corona  
Jordan Smink  
Elizabeth Metzger  
Katharine Willoughby  
Olivia Bullard

**Faculty Advisors:** Dr. Ben Bahr  
Ms. Heather Walters-Romine  
Dr. Uzoma Ikonne

**Discipline:** *Biology*

One of the key pathogenic factors of Alzheimer's disease (AD), the most prominent form of dementia, is the aggregation of an amyloid beta protein 42 amino acids in length, referred to as A $\beta$ 42. The cause of accumulation stems from over production of A $\beta$ 42 and/or the inefficiency of the body's method of removing these protein plaques. Cathepsin B (CatB) is an enzyme synthesized in the body that degrades proteins such as A $\beta$ 42. Degradation of A $\beta$ 42 by CatB is accomplished by truncating the end of the A $\beta$ 42 peptide chain bearing the free alpha carboxyl group of the last amino acid, or the C-terminal. Degradation of A $\beta$ 42 lowers levels in mice expressing hAPP (human amyloid precursor protein) (Mueller-Steiner et al. 2006, Neuron 51:703; Butler et al. 2011, PLoS One 6:e20501) and reduces plaque load and both behavioral and synaptic deficits. Accordingly, enhancing CatB-mediated protein clearance is a promising strategy for treating AD. Small-molecule CatB modulators, e.g. Z-Phe-Ala-diazomethylketone (PADK), enhance lysosomal CatB levels, thereby eliciting protective clearance of A $\beta$ 42 and other proteins in the hippocampus (Bahr et al. 2012, Rejuvenation Res 15:189). The effects of PADK were also examined in rodent organs. Stereospecific, non-peptidic compounds were also developed with a hydroxyethyl isostere and were decoupled from CatB inhibitory properties (Viswanathan et al. 2012, ACS Med Chem Lett 3:920).

33. Efforts to Digitize the UNCP Herbarium

**Presenter:** Andrew Sutton

**Faculty Advisor:** Dr. Lisa Kelly

**Discipline:** *Biology*

Herbarium and other museum collections benefit greatly by way of new digitization software that allows data sharing, networking, record keeping and specimen organization. Our goal was to use Specify 6 software to digitize the UNCP Herbarium for improved collection management. This would enhance this resource for teaching and research. Some biology courses use the herbarium for teaching: identification, survey of local flora, morphology, taxonomy, and herbarium management techniques. Herbarium research includes student and faculty surveys of local flora and the creation of archival specimens. Most of the specimens have been collected from North Carolina, starting in the 1950s and continuing to the present time. The Specify 6 software allows a range of different disciplines to organize information efficiently. We visited the NCSU Mycological Herbarium in the fall of 2012 to get a better grasp of the software. The University of Kansas (UK), which developed the software, provides technical support. During the late fall of 2012, we participated in UK's live online workshop that demonstrated every aspect of Specify 6 and showed us its capabilities. Because of technical problems related to old computing equipment, we were not able to digitize the collection. Efforts will continue into the future.



### 34. I'm Not a Straight Male, But I Have Dreams Too.

**Presenter:** Ashleigh Thorup

**Faculty Advisor:** Dr. Beverly King

**Discipline:** *Psychology*

According to a poll done by Zogby (2004), most American citizens view the American Dream in one of two ways: material goods or spiritual fulfillment with the latter definition being more prominent. Up until the Nineteenth Amendment, women were viewed as less able than men, but women's right have drastically changed since. Along with changes in gender equality, people have been becoming more open about their sexuality, regardless of whether or not it is deemed acceptable by society. This poster looks at the American Dream today, how it has changed over time, and who has access to it while searching to understand who Americans believe can achieve the American Dream and if prejudice still restrains an equal opportunity country.

### 35. Someplace Like Pembroke: Work Histories of the Lumbee

**Presenters:** Sandra Torres, Moe Gazali

**Faculty Advisor:** Dr. Michelle Fazio

**Discipline:** *English*

Pembroke, North Carolina may be a small town but it is home to one of the largest American Indian communities: the Lumbee Tribe. Their work histories provide a unique perspective in understanding Southeastern working-class history and culture. The decline of jobs and how labor—wage, domestic, and unpaid—has been performed across generations is the subject of an ongoing service-learning project designed to collect the work histories of Lumbee Elders. Working with the Director of Elder Services of the Lumbee Tribe, we visited several Heritage sites throughout Robeson County to explore the significant relationship among community, cultural history, family life, and economic developments.

As research assistants, we are in the process of consolidating and analyzing the data of over fifty interviews and will present major themes such as the outsourcing of jobs, education, and gender roles in the workforce, situating individual stories within the larger narrative of American labor history. The project is a follow up to a series of interviews conducted in Dr. Fazio's service-learning classes. The students interviewed Lumbee Elders from several clubs around the Pembroke area and compiled stories of work histories that have never been physically recorded. To help paint a complete picture of the work history and cultural development of the Lumbee, the final goal is to present a collection of portraits in the effort that these work histories are stored and referenced to as an important aspect of the Lumbee culture to preserve their voices for future generations.

### 36. Socio-Economic Life in Rural Greco-Roman Egypt and Palestine: An Experimental Model

**Presenter:** Cameron Troutman

**Faculty Advisor:** Dr. Sharon Matilla

**Discipline:** *Philosophy and Religion*

Many ancient historians share a model of socioeconomic relations in the Greco-Roman world, which posits a sharply dichotomous relationship between a relatively homogeneous mass of self-sufficient, subsistence-level "peasants" living in the countryside on the one hand, and an urban élite parasitical on the taxes and/or rents extracted from these "peasants" on the other. This model has been profoundly shaped by two theoretical constructs, both of which had acquired the status of virtual orthodoxy in the 1970s: (1) a "primitivist" view of the ancient economy, according to which market exchange was of marginal impor-

tance; and (2) an essentialist social-scientific concept of the “historical peasant” as a distinct socioeconomic and cultural human type.

Theoretically, Dr. Mattila intends to propose a new model that begins with a very different premise, one based on what more recent anthropological fieldwork in the study of agrarian societies actually suggests are two fundamental characteristics of the vast majority of these societies: (1) the marked socioeconomic inequalities that typically exist within village communities, which are key to understanding their internal dynamics; and (2) the multiplicity of economic strategies employed by rural people in order to procure their livelihood, which include combining the cultivation of private holdings with tenancy and wage labor, and/or with small-scale commerce and commodity production, as well as with participation in the transportation of goods. Empirically, she intends to show the extent to which these fundamental characteristics are confirmed by the ancient data from rural contexts in the two closely linked regions of Greco-Roman Egypt and Palestine.

This evidence includes thousands of documentary papyri unearthed from village contexts in Ptolemaic and Roman Egypt, which Cameron is helping her to examine. Some of the evidence from these papyri regarding house-sales is presented in this poster.

37. The Effect of a Resiliency Program Approach Using Mobile Devices on Managing Risk and Protective Factors Among Pre-K, Elementary, and Science Education Majors

**Presenter:** Jessica Tulud

**Faculty Advisors:** Dr. Irina Falls,  
Dr. Rita Hagevik

**Discipline:** *Education, Biology*

Beginning teachers encounter a multitude of challenges for which they are not prepared during their program of study. Successful teachers are able to respond to such difficult situations with a resilient “nature” while shaping their own learning to improve their perceived self-efficacy and problem-solving frameworks. Our research objective was to strengthen beginning teachers’ resiliency by providing a way to support them in developing problem solving strategies, accessing expert assistance, using educational and behavioral strategies, organizing their life, and coping with stress, all by using a mobile device. Additionally, teachers have to determine how to best guide students in a technologically dependent world and how to use modern technology tools to manage themselves in their teaching careers. This study included twelve student teachers in their internship semester and used an iPad as a personal management device. Weekly reflections, participant artifacts from using the problem solving iCanDoit app, and interviews served as the data sources. A content analysis of this qualitative data using both risk and protective factors related to resiliency were coded. Results indicated that some of the risk factors faced by these beginning teachers were a lack of support or close relationships, heavy workload, and poor funding in the educational system. Protective factors included a personal sense of faith, strong networking and interpersonal skills, and problem solving or coping skills. Many of the protective factors correlated to the individual’s personality and disposition. Tracking the thoughts of these beginning teachers during their student teaching semester revealed that the iPads were able to provide support, assist these teachers in becoming resilient, and at the same time supported these new teachers in incorporating technology into their professional careers.

### 38. The Reality of the American Dream: A Working Class Nightmare

**Presenter:** Anna Wade

**Faculty Advisor:** Dr. Beverly King

**Discipline:** *Psychology*

For centuries, the “American Dream” has been a beacon of hope for many. Millions of Americans have believed that if one only works hard enough, one can be successful no matter what background a person may come from. The “American Dream” is the idea of a financially stable family with a beautiful home and 2.5 children. However, America has undergone many social revolutions in the past hundred years and as America has evolved, so, too, has the interpretation of the American Dream. So, exactly how attainable is the status of “having it all”? What are the chances of a member of the working class exhibiting upward economic mobility? According to the Wealth of Nations, the wealthiest 1% of Americans owns over half the entire nation’s wealth while another study conducted reports that nearly 66% of the working class self-report themselves as living paycheck to paycheck. Is this the American Dream the nation believes so strongly in, or is the reality of the pursuit of the American Dream really just a working class nightmare?

### 39. Effective Use of the Personal Computer Soundcard as a Test and Measurement Tool

**Presenters:** Robert Wardell, Austin Griffin

**Faculty Advisor:** Dr. William Brandon

**Discipline:** *Chemistry and Physics*

Personal computers are equipped with relatively advanced soundcards (PC-SCs) typically possessing very high performance to price ratio when compared to dedicated measurement instruments – at least for the audio range (20 Hz to 20 kHz). In addition, there exist many versions of freeware allowing one to perform various measurements with the PC-SC. In this work we describe the design, implementation, calibration and performance of a high quality digital storage oscilloscope with custom built interface exploiting these ubiquitous technologies. The classic AC circuits involving a RC high pass filter, RL low pass filter and RLC resonant circuit are used to ascertain the effectiveness of this inexpensive (< \$10.00) electronic toolkit, assuming the availability of a PC.

### 40. Utilizing a Computer Soundcard to Determine the Acoustic Lengths of Pipes

**Presenter:** Robert Wardell

**Faculty Advisor:** Dr. William Brandon

**Discipline:** *Chemistry and Physics*

Measurements of the speed of sound in air utilizing resonance tubes (i.e. hollow cylindrical pipes) are classic experiments in introductory physics laboratory courses. The standard methods include frequency tuning a speaker directed into the tube with a fixed length and/or tube length variation using a plunger with a fixed speaker frequency – with significant overhead cost. At a deeper level it is well known that end effects play a crucial role in estimating the wavelength of the standing waves generated in the tubes. There is some disagreement among theory and experiment involving such end effects in determining the wavelengths of the resulting standing waves – also known as the acoustic length of the tube. In this study we exploit the personal computer soundcard (PC-SC) and appropriate freeware to acquire Fast Fourier Transforms (FFT) resulting from the resonant frequencies associated with sound pulses. An experimental method to determine the acoustical length of the pipes is described and compared to existing theoretical calculations. Essentially, we have established a procedural algorithm allowing students to engage in upper level modern laboratory physics exercises that can be performed without face-to-face supervision and away from campus (i.e. as homework and/or web-based laboratory course).

#### 41. The Collector: A Study of Oppression through Class and Sex

**Presenter:** Kaitlyn West

**Faculty Advisor:** Dr. Monika Brown

**Discipline:** *English*

In 1965, John Fowles published *The Collector*, which is a daunting tale that details the different perspectives and feelings concerning the abductor and abductee relationship. William Wyler directed the novel's film adaptation titled, *The Collector* (1965). Both of these narratives display the inner-struggles of Fredrick Clegg as he attempts to form an identity and secure a loving relationship. The novel and film adaptation display how Fredrick's insecurities allow him to feel justified in stalking and sexually violating Miranda. The purpose of my research is to demonstrate the significance of oppression; the oppression of Miranda by Fredrick, but also the oppression of Fredrick through class status. The novel and film adaptation of *The Collector* is very dark and twisted; however, by questioning the dynamics of oppression, the greater impact of isolated oppression can be exposed.

Through my presentation of *The Collector* I want to investigate the relationship between the novel and the film and how the film displays Fowles' creation. This can be achieved by analyzing the key scenes within the text and film. Wyler depicted the dark nature of Fredrick Clegg and the hopelessness that Miranda felt by deploying methods of dark scenery, rapid scene change, and foreboding background music.

#### 42. Risk and Response of Box Turtles to Prescribed Fire

**Presenter:** Kristoffer Wild

**Faculty Advisor:** Dr. John Roe

**Discipline:** *Biology*

Prescribed fire is a common management technique used to maintain the characteristics indicative to longleaf pine communities, but the effects on non-target species are not well understood. The Eastern Box Turtle, *Terrapene carolina*, can inhabit longleaf systems, but its limited mobility and terrestrial tendencies put it at heightened risk of exposure to fire. Understanding the response of this non-target species to prescribed fire can assist park managers in planning more effective management activities. Using radiotelemetry, we are examining the behavioral response of *T.carolina* fire management at Weymouth Woods Sandhills Nature Preserve. Turtles have selected areas that are in closer proximity to watercourses relative to random, with several individuals spending extended periods in or near water throughout the year. Turtles are typically associating with non-burned areas of the park, including bottomland and upland mixed hardwood forests, though several are!

as of intensive activity occur in the longleaf burn units. Box turtles have repeatedly used wet areas for extended periods and travel long distances along these wet corridors throughout the park. We suggest that turtles are associating with habitats that confer some protection against fire, though they do regularly make forays into burn management units and are then at risk of injury or death from fire. One turtle has been burned and sustained injuries that we suspect contributed to its later death. Though still preliminary, our study highlights areas and habitats of intense turtle use that can help park managers assess the risks of prescribed fire to *T. Carolina*, and ultimately lead to more effective management of this species of management concern.

43. The Correlation between Status Recognition and Self-Esteem; An Initial Exploration of College Students Using Instagram

**Presenter:** Mia Winterbottom

**Faculty Advisor:** Dr. Dandan Liu

**Discipline:** *Mass Communication*

This study examines the relationship between self-esteem and recognition on Instagram, a new photo sharing social network site. The study focuses on recognition, a more specific measurable factor of social capital by analyzing the feedback a user receives on their pictures. Using data from a non-random convenience survey of undergraduate college students at the University of North Carolina at Pembroke (n=75), the study explores the variables associated with a person seeking and receiving recognition through the type of pictures uploaded, use and types of hash tags, as well as the number of likes and types of comments received. The findings showed a positive correlation between self-esteem levels and the amount of recognition received, meaning the higher the level of self-esteem the higher amount of recognition on their Instagram. The study also showed two negative correlations, that users with lower levels of self-esteem seek recognition more frequently and try to control the recognition. The findings were significant as it shows that Instagram can be a site used to fulfill users with lower levels of self-esteem need for recognition and relationships they may lack in the offline world.

## Oral Presentations and Performances ~ (Order of Presentation)

### 1. Carlness

**Presenter:** Dylan Fisher

**Faculty Advisor:** Aaron Vandermeer

**Discipline:** *Music*

I will be presenting an original composition of mine based on the 12 bar blues. This composition utilizes techniques used by Jazz composers like Thelonious Monk and Wes Montgomery in regards to the melody as well as the substitutions I used in the harmony.

### 2. The Participation of Insurers in Medical Tourism

**Presenter:** Jessica Jones

**Faculty Advisor:** Dr. Lydia Gan

**Discipline:** *Economics*

With the growing problems and concerns dealing with the U.S. healthcare systems' cost of care and the system becoming overburdened, many patients are seeking care in other countries, this is known as medical tourism (MT). This research examines the participation of U.S. insurance companies to cover the procedures and treatments that patients seek to receive in other countries. This research attempts to understand the factors that insurers would take into consideration when deciding to participate in MT. Through surveys conducted with U.S. insurers or brokers, we gathered information about the motivations of insurers to participate in MT and their impediments in doing so. The results concluded that the major impediment an insurer has is the concern with the quality of care that can be offered in other countries in comparison to that offered in the US. The quality of care refers to the outcomes of the treatments and procedures, the safety standards of the facilities, and the certifications of those conducting the procedures. The motivations to participate in MT ranged from costs saving for both the insurers and patients to the level of care being the same or exceeding that offered in the U.S. These same impediments and motivations were addressed in articles reviewed during the research phase of this project. Those reservations are continually being addressed and dealt with.

### 3. An Address to Humanity

**Presenter:** Glenda Lowery  
Jeremiah Shalom Moore  
Stuart Nadeau

**Faculty Advisor:** Dr Beverly King

**Discipline:** *Psychology*

In conjunction with the course requirements for HON 2750, Individuals in Society, the group will present a faux address to the United Nations concerning prejudice and discrimination on a global scale. The address will discuss various forms of prejudice such as Jim Crow Racism that existed in the U.S all the way to benevolent prejudice which will bring to the forefront the idea of "unconscious" prejudices. It will cite specific examples of discriminating practices around the world. The address will conclude by offering suggestions and ideas on how to combat the issues of prejudice and discrimination.

#### 4. Transcribing the Voices of the Lumbee

**Presenter:** Amelia Philbrook

**Faculty Advisor:** Dr. Michele Fazio

**Discipline:** *English*

The Voices of the Lumbee is a documentary film project dedicated to recording the most recent changes and progressions in the working lives of the Lumbee. Students and faculty have met with Tribal Elders to record interviews detailing their work history and the decrease of industry in the region. This research gives an insight into the changes affecting the Lumbee throughout the upheaval of previous decades, particularly regarding employment, community, and the struggle for full federal recognition. While portions of these interviews will be viewed in the documentary, the entire audio recordings have also been compiled and transcribed for use in the project's website and instructional booklet.

These transcriptions combine several different disciplines: the account of personal and community history, the preservation of dialect and speech, and the literary tradition of storytelling. In the same way that narrative threads can be traced through a novel, the transcription process often leads to the identification of numerous cultural and social themes in the recorded interviews. These similarities, from elder to elder, give a deeper understanding of the Lumbee community as a whole and preserve historical accounts of changes the tribe has faced.

#### 5. The Dark Side of Being Pretty

**Presenter:** Brittany Taylor

**Faculty Advisor:** Dr. Stephen M Marson  
Dr. Willa Casstevens (NCSU)

**Discipline:** *Sociology & Criminal Justice*

One common research theme in social psychology is the assessment of the social and economic advantages possessed by individuals who are deemed "physically attractive." Since the early 1960's social psychologists have consistently determined that attractive women and handsome men have advantages related to procuring jobs with higher salaries, better seating at restaurants and generally are treated with a higher level of cordiality. Based on unscientific observations of extraordinary high stress levels among extraordinary attractive women, a research hypothesis emerged: Do women who are physically attractive face social discrimination? With a limited literature available, a focus group was employed to investigate the problems of being pretty. Pageant participants (ages 22 to 55; 2 African Americans, 4 Native Americans, 2 whites) were invited to a focus group in order to discuss the issue of the "dark side of being pretty." Patterns of life injustices were uncovered and social concepts were developed. The superficiality of being physically attractive has as many advantages but also disadvantages that are NOT addressed in the literature.

#### 6. Comparing Mathematic Abilities of Children with Autism in Middle School Self-Contained and Inclusive Settings

**Presenter:** Lori Vignali

**Faculty Advisor:** Dr. Gretchen Robinson

**Discipline:** *Special Education*

The question of autism and placement in general education is a rising one. This research examines if there is a significant difference of mathematical ability of students with autism in middle school between self-contained and inclusive settings. This study is a literature review of recent articles in the areas of autism, mathematics, inclusion, self-contained, and middle school. This paper also includes mathematical EOG scores of students with autism in North Carolina. All information was found using electronic databases,

such as ERIC and Education Research Complete, and the website for North Carolina Public Schools. Further research needs to be completed in order to come to a concrete decision, as there is not much research that clearly defines which setting is the most appropriate for mathematic abilities at a middle school level.

## 7. Harsh Chatter

**Presenter:** Madison Wilcox  
Christine Friedrich  
Cassy Styers  
Matthew Godwin  
Jack Slavin

**Faculty Advisor:** Dr. Beverly King

**Discipline:** *Psychology and Counseling*

The experience of prejudice and discrimination has multiple negative consequences (Whitley & Kite, 2010). These consequences are due to the stress resulting from prejudicial attitudes/behaviors and may include negative impacts on physical health, mental health, and self-esteem. Targets of prejudice and discrimination engage in various types of coping strategies; however, the cumulative impact of even small incidents of prejudice/discrimination over time becomes a strain upon one's coping resources. The project described in this abstract is designed to collect a number of personal stories of the effects of experiencing prejudice and discrimination, ultimately revealing similarities. Project team members interviewed individuals of their choosing, all of whom are members of various groups that often experience discrimination or negative stereotypes. Participants included an African-American, a Jewish person, a senior citizen, a Native American and a person dealing with physical disabilities. Participants were asked the same three questions. Each interviewee signed an informed consent form in which s/he was told the purpose of the interviews and the venue in which results would be shared. Interviews were discussed among team members to identify various types of prejudice and discrimination. First-person excerpts from interviews along with interpretations will be woven into an oral presentation intended to help the audience understand the physical, cognitive, and emotional impact of prejudicial attitudes and discriminatory behaviors.

## 8. Externalities of Vertical Farming

**Presenter:** Keith Witherspoon

**Faculty Advisor:** Dr. Lydia Gan

**Discipline:** *Economics*

In this paper, I wrote about vertical farming, because I have a passionate interest in a future green economy. Looking at the consequences of our current industrial farming methods, it has become apparent that we need new agricultural practices that will reduce externalities as much as possible while maintaining and possibly boost our current production. Industrial farming has negatively affected our health and it is one of the major contributors to global warming. It has also contributed to the fall of many local rural economies that depend heavily on local farms. This paper discusses how industrial farms affect local economies and how urban farms can reverse that trend. I will also be discussing the potential of vertical farming and the issues it has with sun light and cost effectiveness. I hope to convey a compelling argument towards a more local, healthier, and environmentally sound agricultural system that will benefit the consumers more than it does to corporations!

The agricultural system we currently adopt is not sustainable and its adverse effects are getting worse over time. A change must be made. The paper is a discussion beyond the environment; it concerns health, the economy, and the future. There are many individuals who are moving towards this goal on their own.



Operating successful urban farms, green houses, and testing efficient indoor farming. These innovations in agriculture will be the precursors to the future of vertical farming.

9. The Last Unicorn Stage Play Performance (novel by Peter S. Beagle; Ed Rutherford, playwright)

**Presenter:** Stephen Shane

**Faculty Advisor:** Hal Davis

**Discipline:** *Musical Theatre*

From audition week to opening night, *The Last Unicorn* had been hard work as well as a treasure over the past 4 months. Working with the actor's schedules, supplying costumes, props and set pieces, and getting together a crew wasn't easy to come by and yet in the end, it all turned out well. When there were days when I thought I couldn't handle it, I always sought out the advice of my mentor, Hal Davis. *The Last Unicorn* opened March 4<sup>th</sup> to March 6<sup>th</sup> with positive, if not, mixed reactions. Audition week in November seemed to be the easiest part of this project. With my stage manager, we were able to pick from a group of thirty only fifteen cast members, handed out their scripts in December and began rehearsals in January.

I admit that there were days where I was almost to the point of quitting or giving up. I would be upset with a cast member's behavior or I wasn't able to get a certain item in time, something along those lines. If I felt down, I would seek the opinion of my mentor and professor, Hal Davis. Being a director himself, he understood the pressures of putting on a show and making sure it all turns out well. He told me that "the wonder of theatre is, when things look bad, on Opening Night, everything turns out great." With that in mind, I re-evaluated my situation and began afresh.

Everything worked out right: the cast, set, lighting, costumes, audience and everything else. Four months of hard work finally paid off and audiences loved it, even if we didn't have microphones. After all the planning, the casting, the rehearsing, the setting up, *The Last Unicorn*, turned out to be a wonderful experience that I'll never forget.

**PURC Council**

Ryan Anderson, Ph.D. Department of History

Anthony Curtis, Ph.D., Department of Mass Communications

Hal Davis, Department of Music

Michele Fazio, Ph.D., Department of English and Theater

Lee Phillips, Ph.D., Department of Geology and Geography, Director – PURC

Robert Poage, Ph.D., Department of Biology

Brandon Sanderson, M.F.A., Departments of Art

Rachel Smith, Ph.D., Department of Chemistry and Physics





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