



April 21, 2016

Dear Faculty, Students, and Guests:

We look forward to Honors Day from the start of each academic year as the culmination of a central aspect of the academy. The performance of students on examinations, writing assignments, oral presentations, and research papers are all part of the evidence we gather to evaluate the success of our academic program. Excellence in this enterprise is most clearly discerned in the honors work and research projects that our students complete under the supervision of their faculty mentors.

Honors Day is set aside to celebrate the academic accomplishments of our students. We have the privilege of listening to students present their work, asking questions, and evaluating responses. The day culminates with Honors Convocation when we gather to acknowledge the extraordinary academic achievements of specific students.

It is my pleasure to congratulate those who are presenting their work, those who are receiving awards, and those who mentored them in their achievements. We have numerous guests on campus today who are with us to witness and celebrate these accomplishments. To all, I extend on behalf of the Faculty of Presbyterian College a hearty welcome to Honors Day 2016.

Sincerely Yours,

Bob Staton '68
President



April 21, 2016

Members of the Presbyterian College Community,

Honors Day is a special happening in the academic life of Presbyterian College. We are proud to highlight on this day the particular academic and creative accomplishments of our students. The projects you see in this booklet reflect important work that students pursue with faculty mentors in the College of Arts and Sciences and the School of Pharmacy. As students engage in research and creative activity, they enhance their academic abilities and develop the drive to succeed in their areas of interest.

Students may participate in different research opportunities throughout the year. A capstone experience is required for all major programs on campus. The PC Summer Fellows program highlights the joint work of students and faculty outside the traditional curriculum. Honors research is, furthermore, an occasion for exceptional students in different disciplines to explore deeper issues within their majors. This Symposium, then, provides the forum for sharing these experiences and presenting the work of students to their classmates, their professors, and others in the PC family.

Students participating in the Symposium also deliver papers, engage in performances, present in shows, and compose publications. While celebrating different achievements, students also receive necessary critical review of their work by experts in their respective fields. Such interactions are essential to the academic or artistic development of any scholar or practitioner.

Congratulations to all of our students who are participating in the 2016 Honors Day Symposium, and congratulations as well to the faculty members who serve as mentors or supervisors. Many thanks go also to those who have organized the Symposium and compiled this booklet for your review: without their diligence and commitment to student success, this day would not be possible.

Enjoy the 2016 Honors Day Symposium!

Sincerely,

Donald R. Raber II, Ph.D.
Provost

HONORS DAY SYMPOSIUM

PRESBYTERIAN COLLEGE
APRIL 21, 2016

“It Was Hard Work, but It Was Family”: Examining Womanhood in the Laurens County Mills through Oral History

Olivia J. Aldridge

Anita O. Gustafson, Ph.D.

Department of Sociology

Despite the inherent subjectivity of memory, personal interviews are invaluable and revelatory contributions to the historical record. Oral history illuminates historically marginalized groups, filling in the gaps in written history. Through oral histories collected with the Textile Mill Memory Project, this research examines the lives of multigenerational local women who held a variety of roles in the Laurens County mills, the way these women navigated the mills' professional and domestic spheres, and the importance of the relational nature of mill villages to women's lives. Characterized by robust work ethic, strongly formed family values, and the pursuit of a better life for the next generation, the mill woman's experience is necessary to our understanding of an industry that formed the backbone of Clinton and a myriad of towns across the South.

Work-Life Balance

Austin Dean Allen

Robert H. Freymeyer, Ph.D.

Department of Sociology

Having a career and working is an important part of life and has been throughout history. Work is important and necessary not only because it provides the income necessary to live, but also because work provides people with a sense of purpose. While work is an important and necessary aspect of life, actual life outside of work is also important. There needs to be a healthy balance between work and life in order for people to be satisfied with their life and to perform at their best. Work/life balance refers to the relationship between components of work and components of life. This research studies aspects of work-life balance and how these different aspects affect different measures of societies as a whole. This research also considers aspects of work, such as the increasing role of technology, and how these aspects affect an overall measure of work-life balance.

Induction of an M2 Phenotype in Human Macrophages via CD163 Gene Induction using Nanotechnology

Perla Abigail Alvarado-Vazquez

Alfonso Romero-Sandoval, Ph.D.

Department of Pharmaceutical Sciences

Alternatively activated macrophages (M2) are essential in the promotion of wound healing. We propose to determine the role of CD163 in this process. The aim of this study was to develop a nanotechnology-based approach for the induction of CD163 gene expression in human macrophages. We used polyethylenimine (PEI) nanoparticles grafted with a mannose receptor ligand (mPEI). We observed an efficient induction of mRNA and protein levels of CD163. Additionally, we observed an increase in the expression of mannose receptor, CD206. We conclude that CD163 can be induced using nanotechnology and this results in an M2 macrophage phenotype.

The Effect of Paint on Wood Weathering

Jonathan Morgan Archer and **Cory Lamar White**

Eli T. Owens, Ph.D.

Department of Physics

In this study, we will evaluate the effects that weather and paint have on wood over time. The wood will be placed in four different environments: a bucket of rainwater, buried in woods, set out for sunlight, and inside. The wood will be painted, primed and painted, or left untreated. After a month of the wood being weathered, tests will be done to analyze the wood's breaking force, the spring constant, and the max deflection. We want to investigate how the paint protects the wood in different weather conditions over time.

Shakespeare's Influence on Gustavo Adolfo Bécquer

Brittany Rose Beasley

Lynne M. Simpson, Ph.D.

Department of English

William Shakespeare, as one of the most canonical authors in literary history, has had an incalculable impact on those writers who follow him. In Spanish literature, this impact is particularly marked in the works of the peninsular writer Gustavo Adolfo Bécquer. Born in 1836 in Seville, Spain, he is perhaps the most well-known Spanish writer after Miguel de Cervantes. Bécquer's writings emerge at the end of Spanish Romanticism and at the beginning of the Modernist movement. I propose that Bécquer adopts Shakespearean imagery, particularly from *Richard II* and *Hamlet*, as a Romantic by emphasizing the fantastic and the imagination. As critic J.J. McGann famously argues in *The Romantic Ideology*, there is no such thing as post-Romantic. Moreover, Bécquer himself becomes preoccupied with Hamlet, whose character he utilizes to construct his own identity as poet. As part of my research project, I have also translated Bécquer's *Cartas Literarias a Una Mujer*, *Introducción Sinfónica*, *Es raro*, *La Cueva de la Mora*, and *La Rosa de Pasión* into English.

La imaginación, la historia y la identidad nacional en las *Leyendas* de Bécquer

Brittany Rose Beasley

Sharon E. Knight, Ph.D.

Department of Modern Foreign Languages

This research will investigate the portrayals of Moors and Jews in two short stories by Gustavo Adolfo Bécquer. Through a detailed analysis of “The Cave of the Moor” and “The Rose of Passion,” published in the 1860s, the researcher will study how these minority cultures informed the conception of a modern and national Spanish identity. The ideologies that influence these portrayals of Jews and Moors in peninsular literature will be related to the presence of minority cultures in modern Spain. Furthermore, the influence of the movement of romanticism, particularly in regards to Bécquer’s propensity for myths, legends, and the imagination, will be examined in the context of a larger conversation among intellectuals about national identity, which was occurring during the time he was writing. In this way, the research will relate the representation of minorities at the beginning of the modern age in Spain with the formation of a national identity, which was established at the same time.

The Physics of Braiding

Grant H. Beidel

Chad L. Rodekoher, Ph.D.

Department of Physics

For millennia, humans have been creating strong ropes from weak material with the art of braiding. These ropes have been made from nylon for creating climbing rope, to braiding kevlar for medical applications. In order for production time and material costs to be minimized and for innovations to be made, a full scientific comprehension of braiding is needed. The purpose of this project is to develop a braiding lab by which to obtain such an understanding.

Synthesis of the N-heptylpantothenamide Siderophore-conjugated Antimicrobial for the Treatment of *Staphylococcus aureus* Topical Infections

Ryan Christopher Blake

Walter R. Ott, Ph.D.

Department of Chemistry

Pantothenamide-type inhibitors are novel antimicrobial agents incorporated into the Coenzyme A and Acyl Carrier Protein biosynthetic pathways, inhibiting bacterial fatty acid synthesis and driving a decline in cellular replication and viability. Conjugation of pantothenamide antimicrobials with iron-chelating siderophores, secreted by targeted bacteria, has shown promise in recent literature as a “Trojan Horse” intracellular delivery system for highly resilient *Staphylococcus aureus* and MRSA biofilms. The objective of this research is to organically synthesize the N-heptylpantothenamide (N7-Pan) antimicrobial compound for siderophore conjugation and for further research projects relating to the development and efficacy testing of pantothenamide-conjugates as “Trojan Horse” antimicrobial agents.

Attachment in Sibling Pairs: When Close Bonds Lead to Co-Rumination

Caroline Julia Blankenship

Sarah C. Burns, Ph.D.

Department of Psychology

Communication is an important part of life. Sharing feelings and opinions provides the basis for relationships with others. For twins and sibling pairs, talking in person or proximity seeking provides a way to serve each other as confidante and friend, especially in times of distress. However, having close attachment with someone, especially one's twin or one's sibling, could lead to problem talk, which is linked to co-rumination. Co-rumination is a tendency to repeatedly focus on negative or distressing issues in conversation and has been linked to depression. Because of their communal nature, girls are more likely to discuss problems with each other, resulting in a higher chance of co-rumination. To investigate this relationship, we will measure rates of different forms of communication, both in person and digitally, and compare these rates to a scale of co-rumination. We hypothesize that girl twins will have higher rates of proximity seeking, and that these individuals will co-ruminate more than any other sibling pairs, but also that twins communicate and co-ruminate more than regular sibling pairs.

Type D Attachment in Adolescents

Ashlyn Brooke Bordelon

Brooke C. Spatta Ph.D.

Department of Psychology

This study investigated the relationship between Fear Induction (a parenting style) and Indecision (an indicator of Type D attachment) using self-report questionnaire data obtained from 78 students (51 females and 27 males) in the CHAMPS program. It was hypothesized that adolescents (11-16 years old) who report Fear-Inducing parenting would also report high levels of Indecision. Correlational analyses indicated a significant, positive relationship between the perception of the caregiver as frightening or “Fear-Inducing” and Indecision, $r(78) = .327, p < .01$. This finding supports the assertion that the measures used serve as a valid assessment of Type D attachment in adolescents.

Persistence of Avoidance Behavior in Defeated Male Syrian Hamsters

Ashlyn Brooke Bordelon

J. Alicia Askew, Ph.D.

Department of Psychology

Our lab uses the conflict alleyway to investigate post-defeat avoidance behavior in male Syrian hamsters. In Experiment 1, subjects failed to demonstrate long-term retention of defeat-induced avoidance 75 days post-defeat. Experiment 2 investigated 7-day retention of defeat-induced avoidance. In this experiment, 57.14% of the subjects met avoidance criterion after one defeat trial, 85.71% after two trials, and 100% after four defeat trials. Short-term (7 day) persistence of avoidance behavior was exhibited in 42% of the subjects. Findings suggest that post-defeat avoidance is not a long-lasting phenomenon. The percentage of long-term avoiders may be higher if subjects experience at least four defeats.

The Forgotten Actor of the Vietnam War: How the Vietnam War funded South Korea's "Miracle on the Han"

Jacob Patrick Buckley Brannon

Michael A. Nelson, Ph.D.

Department of History

This research examines the relationship between the "Miracle on the Han," South Korea's rapid economic advancement, and South Korea's participation in the Vietnam War. In doing so, it will look at the rationale of South Korea, led by Park Chung Hee, for entering the Vietnam War, the impact of the large amounts of economic aid given to Korea by the United States, and how the aid helped further Chung Hee's five-year economic plans. Furthermore, the social impacts of the Vietnam War and how Koreans today view this war and its impacts are also considered.

Fractal Music

Musashi Jason Briem

James A. Wanliss, Ph.D.

Department of Physics

This project focuses on fractals and converting fractals into sounds and music. In this project, fractals are represented numerically in MATLAB, a programming language, so that they may be converted into sounds and music. A graphical user interface, GUI, was created in MATLAB so users could select from a variety of fractals to listen to. The results of this project include several melodies that users may play, depending on the fractal they choose. This project also provided an opportunity to study the interesting phenomenon of power laws in music. This music may have positive effects on brain function, similar to the speculative effects of classical music on brain function.

Things Are Heating Up: The Impact of Presidential Policies on Climate Change

Ryan A. Bristow

Erin S. McAdams, Ph.D.

Department of Political Science

Previous research regarding the attitudes of political parties suggest that Republicans may have less concern about climate control compared to Democratic presidents due to conservative Republicans' belief in less government involvement and more economic growth. This research project suggests that Republicans do not support pro-environment regulations compared to Democrats. By examining multiple policies by presidents and analyzing data from the Environmental Protection Agency index, this paper examines Greenhouse Gas Emission levels and whether the policies made by American presidents during their administrations had an impact on climate change during the 1900s through the 2000s.

Household Influence on Educational Attainment

Clem Edward Britt

Robert H. Freymeyer, Ph.D.

Department of Sociology

This research uses data from the 2014 General Social Survey to examine and compare the educational attainment of children that grew up in a single-parent household with those who grew up in a two-parent household. These two types of households differ in multiple ways.

Children in a two-parent household often have more support, financial stability, and time devoted to them because of the presence of two parents.

I expect to find those who grow up in a two-parent household achieve a higher education at least partially because of the socioeconomic status differences found between the two household types.

Space Weather Influences on Human Physiology

Denzel Robinson Brown

James A. Wanliss, Ph.D.

Department of Physics

Chronobiology is an emerging branch of science that studies the variety of cycles in the functioning of organisms and their respective environments. We believe space weather influences human life on many levels. This project explores the possibility that human physiology is not neutral to human interactions with space weather exposure. We seek a possible connective relationship between occurrences of the major space storms' main phase and the behavior of human blood pressure by first applying superposed epoch analysis to relate the two occurrences. We hypothesize a relationship between disruptions of certain circadian physiological patterns and interactions of changing geomagnetic field along with workings of the heart.

Granular Acoustics through Interfaces

Benjamin Conner Cagle

Eli T. Owens, Ph.D.

Department of Physics

Granular materials are a collection of macroscopic, athermal particles; for example, both sand on the beach and the rings of Saturn are granular materials. We study how sound propagates through a sand gravel interface by conducting two experiments. One experiment subjects the system to individual pulses of sound and the other experiment subjects the system to a continuous input of sound via a speaker. By comparing these two inputs, we will be able to better understand the affect that an interface has on the travel of sound through a system.

Mexican Lives, American Ordnance: Pancho Villa and the Mexican Revolution

Travis B. Carn

Jaclyn A. Sumner, Ph.D.

Department of History

How did Francisco “Pancho” Villa, a small-time bandito from Durango, Mexico, become a national sensation in Mexico and the United States, and perhaps more importantly, how did his regime collapse? Historians widely agree that the height of Villa’s success was in 1914 and that the turning point came in 1915; however, many historians disagree on how the end of his success came about. Many seem to believe that it was the strategic failings of Villa that led to his downfall, while others seem to think that it was the interruption of supply lines and the withdrawal of U.S. support that caused Villa’s decline and eventual downfall.

I contend that neither of these ideas were the singular reason for the end of Villa. Rather, I believe that it was the loss of U.S. support and dwindling ammunition reserves that caused Villa’s multiple strategic miscalculations.

Physics Demonstrations Using Synchronous Detection

William Ray Christenbury III and **Malachi Ian Koenig**

Eli T. Owens, Ph.D.

Department of Physics

The purpose of this project is to build a circuit that will utilize a photo-gate to control the magnetism of an inductor. In doing so, we will be able to use the inductor as an electromagnet to suspend a metallic target. Using this apparatus, we will demonstrate two important physics principles. The first demonstration, which is commonly known as The Monkey and the Hunter, shows that all objects fall at the same rate. The second demonstration will levitate an object showing the properties of magnetic attraction and repulsion.

Archival Images and Contemporary Photographs as Theatre Design Vocabulary and Dramaturgical Research

Kelly Michelle Cichon

Lesley J. Preston, M.F.A.

Department of Theatre

This project is an exercise in visual dramaturgy supporting the design of the plays that will be created next year in the Documentary Theatre and Theatre for Social Change classes as part of the Textile Mill Memory Project. I had two goals for this research. The first was to locate archival pictures of the textile mills in Clinton during the time in which the mills were thriving. The second was to take contemporary photographs of the same sites that would convey the emotional impact of the loss of the mills by recording their current physical state.

Men as Animals and Women as Play-Things: The Vietnam War According to Hollywood

Allie R. Cobb

Michael A. Nelson, Ph.D.

Department of History

American classrooms have increasingly relied on films to assist learning in the past few decades. Because films have such a voice in remembering history, I chose to investigate how films about the Vietnam War represent sex and gender roles in their story lines. Typically all male roles are a part of the military in some aspect; women are portrayed as passive witnesses of war and highly objectified. When compared to the reality of sex and gender roles of the time, the films prove to be both historically accurate and inaccurate. My project also investigates the messages that these Vietnam War films projected in terms of masculinity and femininity and whether these messages were adopted by the society of that time.

The Interaction between Cognitive Processes and Spirituality

Sophie Marisa Cobb and **Christine Ann Darracott**

Jay L. Michael, Ph.D.

Department of Psychology

We examined how different cognitive processing styles relate to religiosity. In this study, we manipulated an individual's action identification level (the way people think about their actions) to see if it affects a person's level of spirituality. We found that individuals who are naturally low level thinkers had marginally significant changes in spirituality when manipulated, and individuals who are naturally high level thinkers did not. Unlike our predictions, low level thinkers had no cognitive reaction to the manipulation. There was little change in high level thinkers' spirituality regardless whether they were forced to think in an unnatural, low level, thinking. This lack of change in spirituality suggests that naturally high level thinkers are more able to maintain their spirituality regardless of what situation they are in.

The Robert Mercer Vance Collection: Archives of the Textile Mill Memory Project

Jillian Rebecca Collier

Kendra Y. Hamilton, Ph.D.

Department of English

A valuable resource of Presbyterian College's Textile Mill Memory Project is the Robert Mercer Vance Collection, which is housed at Thomason Library. The collection includes scrapbooks, correspondence, images, and other various archival materials regarding many aspects of the textile mills in Clinton, S.C. The objectives of this project are to survey the contents of the collection and record detailed descriptions of the contents in order to eventually create a digital finding guide for use in online research. This collection of archives is significant because it will provide evidence that helps position the Clinton mills within the context of a global textile industry. The results of this project will be an organized collection of archival materials and a digital finding guide that will enable the collection to be searchable online. Increasing the accessibility of the Robert Mercer Vance collection will allow scholars to use the materials in future research and allow the general public a chance to learn more about the textile mill history of Clinton.

Geocaching and Interactive Mapping in the Textile Mill Memory Project: A Digital Humanities Project

Allison Rose Cooke

Sharon E. Knight, Ph.D.

Department of Modern Foreign Languages

The Textile Mill Memory Project's (TMMP) main goal is to preserve the history and to tell the stories of the mills located in Clinton, South Carolina. One way to carry out this goal is through geocaching—a “real world treasure hunt using GPS-enabled devices... [to] navigate to a specific set of GPS coordinates and then attempt to find the geocache (container) hidden at that location.” The purpose of geocaching is to interact with one's environment, to observe a location, and to experience the fun and excitement of searching for hidden treasure. In conjunction with the TMMP's goals, geocaching can provide a way to increase the public's interaction with and interest for the history of local mill sites. This presentation discusses the research process of creating and placing geocaches around PC's campus and Clinton, and describes the future role digital humanities will have with the TMMP.

Computer Simulation of Granular Systems

Cody Adam Creech and **Denzel Robinson Brown**

Eli T. Owens, Ph.D.

Department of Physics

We encounter granular materials daily, from sugar to the rings of Saturn. Granular materials are collections of macroscopic particles that have many unique properties. We will create virtual granular simulations using LAMMPS. The goal of our research is to simulate sending an acoustic signal through a granular system. In these simulations, we are able to control the amplitude and velocity of the acoustic pulse. The results of our findings have applications in non-destructive probing of granular systems.

Can Your Cognitive Style Influence Your Faith? Religiosity's Association with Cognitive Flexibility and Action Identification

Christine Ann Darracott and **Sophie Marisa Cobb**

Jay L. Michael, Ph.D.

Department of Psychology

Religious belief is associated with health benefits and increased lifespan. However, it remains largely unknown why this association exists. We propose these effects are related to unique cognitive processing styles: cognitive flexibility and action identification level. We suggest these differ based on a person's spirituality and faith strength. Using a quasi-experimental design, we found that cognitive flexibility and action identification are related processes. Cognitive flexibility also has a stronger relationship with religiosity than action identification. Higher cognitive flexibility is related to stronger spirituality and stronger faith. In addition, we found that both higher cognitive flexibility and higher action identification are linked to greater intrinsic motivation to pursue faith. These results demonstrate that religiosity is associated with specific cognitive processing styles.

Sidewall Forces on Grain Silos

Taylor Robert Davidson

Eli T. Owens, Ph.D.

Department of Physics

Granular materials are one of the most industrially used, transported, and stored materials. I am studying the effects of sidewall forces on model grain silos. The force buildup on silo sidewalls is an important design consideration, yet it is a poorly understood phenomena. My experimental setup consists of a model silo with a force sensor placed near the bottom. Grain will be dumped into the silo where a sensor will measure the force. From this measurement, I will study the force profile on the silo sidewall during filling.

The Construction and Maintenance of a Scanning Electron Microscope

Robert Traynham Davis

Chad L. Rodekoher, Ph.D.

Department of Physics

Electron microscopy allows for the imaging and analysis of much smaller samples than is possible through conventional optical microscopy. Optical microscopy is limited by the relatively large wavelength of visible light, which constrains the magnification of optical microscopes. Electron microscopy utilizes electrons instead of light, because of an electron's smaller DeBroglie wavelength much higher magnifications can be reached. A Scanning Electron Microscope (SEM) has been built from the ground up. The practical skills learned in the construction of this SEM combined with detailed knowledge of the actual mechanics of the Scanning Electron Microscope allow for the production of much higher quality images.

Bloodstained Pesos: Government Corruption and the Mexican Drug Trade

Samantha Kathleen del Toro

Jaclyn A. Sumner, Ph.D.

Department of History

This research focuses on the relationship shared by Joaquin “El Chapo” Guzman and the Mexican government. The goal of this research is to reveal how El Chapo used forms of political corruption to increase the power and territory of the Sinaloa cartel as the political scene in Mexico was changing. By identifying the connections between El Chapo and the PRI as well as the PAN and analyzing the effects/implementation of the anti-corruption policies that each party had on the Sinaloa Cartel this research illustrates how deeply rooted corruption is in Mexico and how the Mexican drug trade continues to flourish because of it.

Bombs Away: Radical Anti-War Protesters of the 1960s and 1970s

Robert Scott Dennis

Michael A. Nelson, Ph.D.

Department of History

This research takes a look at radical anti-war protesters of the 1960s and 1970s. These often secret organizations were responsible for some of the most violent acts of domestic terrorism in the history of the United States. Groups like the “Weather Underground” and the “Up Against the Wall Motherf****ers” were strongly against the United States’ involvement in the Vietnam War and believed the government had become a totally bloated and corrupt system. With college educations and books like *The Blaster’s Handbook*, these aren’t your average “hippies.” Bombs away!

Fire-Eating in Contemporary America: The Incendiary Rhetoric of the 2016 Presidential Primary Campaign

Robert Scott Dennis

Erin S. McAdams, Ph.D.

Department of Political Science

With candidates like Donald Trump, the 2016 Election has been far from ordinary. What many Americans have noticed is the incendiary rhetoric spoken by many of the candidates involved in the election. This research examines the polarizing, and often incendiary, rhetoric used by the candidates in the 2016 Presidential Election. Utilizing content analysis of the candidates' speeches, this research project compares the political rhetoric of the 2016 Presidential Election to that of the 2000 Election to determine whether the speeches given by contemporary politicians are more incendiary than those of this past election.

Gene Expression in the Anabolic and Catabolic Metamorphosis of *Rana catesbiana*

Lauren Michaela Denton and **Sydney Lee Ronzulli**

James T. Wetzel, Ph.D.

Department of Biology

During the process of metamorphosis in amphibians, two different cellular mechanisms occur—anabolism, which is a series of physiological changes in morphology that build new structures in the body (such as the formation of the limbs), and catabolism, which is the digestion and reabsorption of existing structures (such as the progressive loss of the tail). Both catabolic and anabolic metamorphosis are initiated by the hormone thyroxin. Thyroxin production then initiates gene expression that results in the synthesis of catabolic and anabolic enzymes. Ultimately, RNA transcription is what affects synthesis of these anabolic and catabolic enzymes. Our goal was to note the expression of gene action in these tissues that initiates metamorphosis by comparing RNA levels in tissues before and after the event of metamorphosis in the bullfrog *Rana catesbiana*. Since metamorphosis is a critical-timed event when tissues are receptive to hormones, *Rana* tadpoles were obtained at the “limb bud” stage of development. We exposed the tadpoles to a 0.01ppm concentration of thyroxin (continuous dermal absorption), taking tail and limb bud tissue samples before and following observations of any anabolic (limb) or catabolic (tail) changes. We then extracted RNA from samples to compare RNA levels in the pre- and post-metamorphic stages of tail and limb. This research helps identify differential gene expression in amphibians that regulates metamorphosis and show at the molecular level the effect of thyroxin on tissues during anabolic and catabolic changes from larval to adult body form.

Soldier Boy: The Highs and Lows of Vietnam Veterans in Film

Anthony DaRon Dickey

Michael A. Nelson, Ph.D.

Department of History

The Vietnam War is remembered through several different lenses; film as a medium has been helpful to portray what this conflict was all about. Whether being used to display the gruesome fighting that took place or the relationships of veterans and their families, film has been a helpful tool. Making sense of how veterans have been depicted across history struck my interest. Discovering what specific traits directors and writers gave different characters and the reasoning behind them contributed to my understanding of the conflict.

Using Sharkskin-Inspired Surface Material to Minimize Bacterial Growth

Rachel Cannon Duncan

James T. Wetzel, Ph.D. and Stuart G. Gordon, Ph.D.

Department of Biology

Sharkskin is resistant to bacterial colonization due to the unique placoid scale pattern of sharks. This pattern minimizes deposition of bacterial bio-film layers, and accordingly, lessens bacterial colony formation. Sharklet is a synthetic surface material that is modeled after the surface morphology of shark skin. Scanning Electron Microscopy has illustrated the high degree of similarity between the surface patterns of Sharklet technology synthetic materials and the actual skin of the shark species *Carcharhinus* (blacktip shark) and *Sphyrna* (hammerhead shark). After inoculation with several strains of marine bacteria, the Sharklet surface was noted to have decreased biofilm formation when compared to a smooth control surface.

These results contribute to the growing field of biomimicry and the development of surface coatings that prevent the growth of bacteria. Specifically, Sharklet technology has the potential for minimizing barnacle and algae adhesion on ships since these types of marine fouling organisms require a biofilm layer before settling from their planktonic stages onto various surfaces such as hulls or docks. There is also potential application in health care facilities where Sharklet covered surfaces could minimize bacterial growth, and accordingly help reduce hospital-acquired infections.

Freedom Fisheries: A Global Review of the Impact of Freedom on Fisheries' Sustainability

Jacob R. Evans

Erin S. McAdams, Ph.D.

Department of Political Science

With the assumption that fisheries' management systems have failed at a local, domestic, and international level, leading scholars have pushed the idea of restructuring approaches to fisheries' management. This leading theory of managing fisheries and its inherent connection with democracy provoked the research question of whether or not governmental structure influences the stability of a fishery. More specifically, this research project examines whether a country with a higher level of freedom is more conducive to a fishery's sustainability than countries with lower levels of freedom. This research seeks to operationalize quantifiable data representing a country's level of freedom (using the Freedom House Index) in comparison with its respective fisheries' levels of sustainability (as measured by a composite fisheries' sustainability index). A positive relationship is expected between the two variables, where fisheries' sustainability increase with higher levels of freedom.

Bibles, Bandoliers, and Borders: An Analysis of U.S. Involvement in the Cristero Rebellion

Tyler Daniel Fagan

Jaclyn A. Sumner, Ph.D.

Department of History

In this work, I examine La Cristiada (1926-1929) from the northern side of the U.S.-Mexican Border by claiming that the United States was unconventionally involved via the personal diplomacy of its ambassador Dwight Morrow and its role as a safe haven for refugees, some of whom supported Catholic insurgents back home. Utilizing a plethora of sources, including many scholarly commentaries, original correspondence, official Congressional records, letters from those oppressed by the regime, and more, I argue that United States' involvement in the Cristero War as a whole, while unconventional, was a significant one nonetheless.

Jenga: Building and Construction

Nancy Magdy Fanous

Eli T. Owens, Ph.D.

Department of Physics

The game Jenga is made of different materials such as wood, plastic, or cardboard. Each of these materials have a different friction coefficient, creating different condition under which each type of Jenga tower collapses. In this project, I analyze the center of gravity, the tipping point, and the coefficient of friction for each of the different Jenga block types. I then evaluate how the block type affects tower stability. I observe variations in the mass and size of the blocks. Additionally, I create an ideal, computer model of Jenga and compare that model to the physical game.

A Study of the Dendroclimatic Signal of White Oak (*Quercus alba*) Compared with the Palmer Drought Severity Index

Sydney Marie Fontenot

Michael O. Rischbieter, Ph.D.

Department of Biology

The purpose of this study was to determine the accuracy of the yearly growth ring signal in white oak (*Quercus alba*) with respect to the local climate data (mean temperature and total yearly rainfall) over the past fifty years. These data were then used to compare the yearly signal to the Palmer Drought Severity Index (PDSI). Several recent studies on various tree species worldwide have indicated that seasonal differences in moisture availability, especially in the winter months of October-March, are the most important in determining tree-ring widths in subsequent growing seasons. White oak trees from on-campus locations as well as from nearby mixed deciduous hardwood forests were sampled to test several assumptions related to the dendroclimatological signal in the tree rings. An increment borer was used to take two samples from each old growth tree, and several young white oak trees were cored to the pith to determine if growth ring variability might be related to growth stage of the tree. Tree rings were measured under a Meiji EMX binocular microscope to the nearest 0.1mm. The ARSTAN program was used to standardize the core samples, and check for mean sensitivity that was used to compare with the climate data, having first been run through the COFECHA program to check for tree ring dating validity. An initial analysis of the data indicates that tree ring chronologies are correlated to total yearly precipitation at a higher level than either temperature means or PDSI levels.

La Conquista Sexista y su Legado: El Trato de los Indígenas en la Historia y la Sociedad de México

Julianna Grace Franklin

Clinia M. Saffi, Ph.D.

Department of Modern Foreign Languages

This paper looks into the representation of indigeneity as feminine throughout Mexico's history and how that has affected the indigenous peoples' current position in society. Analyzing literature and culture from the Conquest to the Indigenismo movement to modern-day, it seeks to find a connection between a feminine representation of the indigenous and their oppression suffered in a macho society. A key feature in this analysis is La Malinche and how her role in the conquest being later canonized into Mexican history through the Indigenismo movement affected the national image of the indigenous. The conclusion focuses on the disconnect between the national representation of the indigenous and their reality, challenging the sustained use of the language of the conquerors that continues to alienate the true natives of the land.

Minority Individual's Environmental Concern in the United States

Eilis Anne Gehle

Robert H. Freymeyer, Ph.D.

Department of Sociology

This research considers the impact of minority status on environmental concern. I use survey data collected in the United States in 2011 as part of Wave 6 of the World Values Survey to determine whether nonwhites express less concern about the environment than whites. Additionally, I consider how social class and education influence this relationship. I expect to find that nonwhites report less environmental concern, with social class and education differences between nonwhites and whites partially accounting for this relationship.

Live from New York, It's Political Bias: *Saturday Night Live* and Party Politics in Presidential Elections

Jesse J. Glasgow

Erin S. McAdams, Ph.D.

Department of Political Science

Saturday Night Live has long established itself as a staple of American popular culture. Despite a grounding in entertainment, the show has gained notoriety in the political world for its famous depictions of presidential and vice presidential candidates in various skits—notoriety that is extended considerably when one considers the audience size that *Saturday Night Live* consistently attracts. It is important to question what political influence the show actually carries and if that influence has been used to portray particular politicians in a biased way. This paper analyzes the content of specific political skits that have aired on *Saturday Night Live* in recent presidential elections to test whether Republican presidential and vice presidential candidates are more harshly depicted than their Democratic counterparts.

The Rise of Subcomandante Marcos and his Zapatista Army of National Liberation

Devron J. Glenn

Jaclyn A. Sumner, Ph.D.

Department of History

The Mexican government has always neglected the indigenous, leaving them without proper living conditions and lack of political representation, from the very beginning when Mexico won its independence from Spain all the way to the Porfirio Diaz era. However, in 1994 Subcomandante Marcos along with his army called the EZLN (Zapatista Army of National Liberation) started a peaceful campaign to end this mistreatment from the Mexican government. Subcomandante Marcos successfully used Social Media and Women Insurgents to lead a movement against the Mexican Government for the Rights of the Indigenous in Chiapas, Mexico, by exploiting their wrongful actions toward the Indigenous of Chiapas. My research uses testimonials, interviews, and journalism to argue that through the use of social media and support of women insurgents, Marcos led a successful movement that caught worldwide attention.

“This Tomboy Thing”: The Cultural Lag in Cinematic Depictions of Female Team Sport Athletes

Erika Laine Gotfredson

J. Justin Brent, Ph.D.

Department of English

Although female team sports were considered socially unacceptable prior to 1972, women have embraced female team sports with astonishing speed and enthusiasm ever since the implementation of Title IX. Interestingly, though, various forms of sports journalism seem hesitant to depict this momentum, often choosing to underrepresent and misrepresent these athletes in the media. Female team sports films are even more problematic, as they tend to focus on outdated obstacles that once interfered with the athletic endeavors of female team sport athletes but no longer apply. This study shows that the cultural lag fueling female team sports films can be deconstructed easily, allowing us to reimagine how the sports film genre might act in a progressive manner to continue enhancing the images of female team sport athletes within society.

Acoustic Investigation of Buried Objects

William Michael Grismore and **Eddie Lee Alford**

Eli T. Owens, Ph.D.

Department of Physics

In granular materials, acoustic waves propagate along disordered chains of high stress. We have constructed an acoustic wave generator, which we use to study experimentally the propagation of sound through a consolidated granular material, and around a buried object of much greater radius than the surrounding grains. We have studied the effect of varying frequency and amplitude on the system. Piezoelectric sensors placed near the bottom of the system are used to measure the force propagation, and noise is removed from the data by computer, prior to analysis.

Singing as Therapy for Cognitive Communication Impairments

Sara Walden Hanna

J. Justin Brent, Ph.D.

Department of English

The purpose of this research study was to test the efficacy of singing as a form of speech therapy treatment in helping patients with Cognitive Communication Impairments (CCI) overcome and cope with communication handicaps as a result of common geriatric issues, such as dementia and stroke-induced aphasia. In performing this research experiment, I examined the extent to which singing in speech treatment improved patients' moods, their communication and comprehension abilities, and their level of interest in therapy. I was ultimately able to support my hypothesis that CCI patients exposed to singing in speech treatment would experience improvements in cognition and disposition.

Assessment of the Peer-Assisted Learning Resource Center for Introductory Biology Students at Presbyterian College

Michael P. Harris

Suann Yang, Ph.D.

Department of Biology

In spring 2015, our new peer-assisted learning program (Learning Resource Center, or LRC) was developed to support our second semester introductory biology course for majors. Undergraduate biology majors and minors staffed the LRC, and Peer Mentors (PMs) gave students feedback to help master skills to successfully complete the course. The purpose of this study was to analyze the effectiveness of the LRC from the student's perspective. The results from the end-of-course survey were analyzed using the statistical software JMP. Analysis of the data suggested there was no association between LRC attendance and responses to other questions, however students generally liked attending the LRC and thought it was a helpful resource. Based on the responses, we have made necessary alterations for this year.

The Effects of *Yersinia pestis* on Prairie Dogs and Prairie Ecology in Western North America

William Brittain Irick

Rachel M. Pigg, Ph.D.

Department of Biology

Emergent diseases, such as Ebola, Zika, and Chikungunya, are some of the most widely covered global health topics today. To better control emergent diseases, we must first understand the mechanisms by which they are transmitted. Black Plague is a perfect model to test disease spread because it still persists in rodent populations worldwide. Prairie dogs on the western plains of North America are extremely susceptible to plague caused by *Yersinia pestis*, experiencing periods of low and high incidence. Their susceptibility to *Y. pestis* is not only important to global human health, but also to prairie ecology due to the prairie dog's role as a keystone species. I created an agent-based computer model system using current literature to simulate plague transmission in prairie dog communities in an effort to determine the role of prairie dog movement in plague epizootiology.

The Gendered Portrayal of Inanimate Characters in Children's Books

Laura Christine James and **Taylor C. Berry**

Julia Wilkins, Ph.D.

Department of Education

Extensive research into the gendered portrayal of characters in children's books has been conducted over the past four decades, both in the United States and in Europe. This research has focused almost exclusively on human and animal characters. Because teachers and parents may avoid selecting books in which male and female characters are portrayed in stereotypical ways, we examined the gendered portrayal of nonhuman and nonanimal characters in children's books. We reviewed 60 children's books in which the main characters were anthropomorphized inanimate objects in order to determine how male and female characters were portrayed. Our findings revealed that male characters were objects typically associated with masculinity, such as fire engines, trucks, and trains, and female characters were entities associated with femininity, such as clouds, flowers, and houses. In addition, male characters were frequently portrayed craving adventure and being heroic whereas female characters were typically portrayed as insecure and as needing help from others.

Induction of P-glycoprotein in Colorectal Cancer Cells with Fexofenadine

Wanai S. Kum

Christopher Farrell, Ph.D.

Department of Pharmaceutical Sciences

P-glycoprotein (Pgp) is an efflux transporter that has an effect on the pharmacokinetics of many drugs, as a result can affect the effectiveness of the drugs. It is the key factor in chemotherapy resistance as it causes these drugs to be removed from the cancer cells thus decreasing the effectiveness of the drugs. Recent studies have shown that chemotherapy naïve patients have resistance to chemotherapy agents, and causes are currently unknown. In this study, we aim to induce the p-glycoprotein in colorectal cancer cells using the non-chemotherapy, fexofenadine. Once the induction of the efflux transporter has occurred in the chemotherapy-naïve cancer cells, we will then treat the cells with a chemotherapy agent to see if the chemotherapy-naïve cancer cell will show resistance to the chemotherapy agent.

Spent Oyster Mushroom Substrate (SOMS) Inhibits Conversion of Seed Energy Stores to Seedling Biomass in *Phaseolus vulgaris* (the common bean)

Gabriela Josephine Lewis

Suann Yang, Ph.D.

Department of Biology

SOMS is the waste product from mushroom cultivation and could be used as an herbicide to inhibit weeds. SOMS may inhibit seedlings because the post-germination plant is not protected by a seed coat. Alternatively, SOMS may provide seedlings with nutrients that result from fungal decomposition. I tested the effect of SOMS on beans. SOMS and bean variety did not have a significant effect on germination, root length, or shoot length of beans. However, the control seeds lost more biomass than the seeds exposed to SOMS, suggesting that SOMS inhibits the rate at which seedlings grow from energy stores in the seed. Considering that only one growth measure was affected, SOMS as a bioherbicide could be safe for crop species such as beans.

Fractals in Nature

Mahene Emabenu Lewis and **Cassidy Davis**

James A. Wanliss, Ph.D.

Department of Physics

We are studying fractals patterns in nature, specifically looking for patterns in trees, and testing the idea of self-similarity. Our experimental setup was broken into two parts. First we need to acquire high quality images of “natural” fractals. We obtained numerous images of trees over a number of months. Second, we analyze these images to search for fractal patterns in specific locations. We apply the “box- counting” method to determine the fractal geometry to see if unique patterns are found in certain location. In addition, we explore how the fractal nature of tree growth changes over time.

The Palynology and Biostratigraphy of the Lower Permian Alfredo Wagner Locality, Santa Catarina Brazil

Anna Gabrielle MacGregor

Michael O. Rischbieter, Ph.D.

Department of Biology

In 1998, Dr. Michael Rischbieter traveled to southern Brazil, where he collected plant fossils from a newly discovered locality near Alfredo Wagner, Santa Catarina State. The discovered sediments had noteworthy plant fragments and turned out to be from the lower Permian Rio Bonito Formation. These sediments were sent to Global GeoLabs in Canada, where standard palynological procedures were used to prepare slides of pollen and spores and a liquid-based “residue” that contains pollen and spores. The residue is the source of the pollen and spores for this study. As a part of the overall study being conducted on these fossils, it was determined that the palynological component could be very helpful in determining where stratigraphically in the Rio Bonito Formation these sediments were located. A preliminary analysis of the pollen and spores last year by Billy Mullinax indicated that the stratigraphic layer might be included in the silty mudstone just above the upper Candiota coal seam. The purpose of this research is to prepare high quality micrographs in order to compare them with palynoflora from Brazil. This comparison should provide the basis by which these sediments can be accurately placed within the Itararé Subgroup, and as such, will be a new report of these pollen and spores for this section of the Paraná Basin.

Analysis of Rope Braiding

Diego Manzanas and **Christopher Sacco**

Chad L. Rodekoeh, Ph.D.

Department of Physics

Rope braiding is a topic of industrial process that is designated more toward an art rather than a science. Considering the vast uses for rope and the importance that rope production plays in our everyday lives, a more analytic approach to rope braiding has vast benefits. Understanding the processes and dynamics behind creating rope has key industrial applications. Using a three dimensional variation of the common capstan problem found in mechanics classes, a more comprehensive understanding of the processes involved at the braid point can be reached. Using this analysis, relating tensions between intersecting yarns and the intersection positions near the braid point become attainable.

Ballads of the Drug Trade: Narcocorridos and Counterculture in Mexico

Conner James McCoy

Jaclyn A. Sumner, Ph.D.

Department of History

Mexico is a country teeming with diversity and culture, and the music of Mexico reflects this diversity. One musical style in particular has recently become a very significant part of Mexican culture: the narcocorrido. These drug ballads, as they are often called, address a prominent issue in and around Mexico today, the drug trade, through the use of a traditional style of Mexican music. This style, furthermore, can be traced back to the Mexican countercultural movement of the 1960s known as “La Onda.” If not for La Onda, narcocorridos would not be the culturally significant phenomenon they have become today.

Operation Paperclip

Matthew P. Mitchell

Stefan W. Wiecki, Ph.D.

Department of History

During WWII, Germany demonstrated access to rocket-based weaponry that was decades ahead of the rest of the world. As the American and Soviet troops pressed farther into Germany at the end of the war, both sides began coming across German research centers. Fearing what would happen if the Soviets got their hands on the German research, the American government began abducting and hiding Nazi scientists. All American rocket development is based on the research of Nazi scientists who were abducted under this program. While this operation benefited America greatly, it also protected Nazi war criminals. Many of the men America hid were actively being hunted by the international community to stand trial at Nuremberg, but for decades America denied knowledge. I researched this program and tried to weigh the immorality of protecting these men, against the benefits that may have kept America safe through the Cold War.

Day of the Dead: A Modern Descendant of the Aztecs

Lisa Andrea McIsaac

Jaclyn A. Sumner, Ph.D.

Department of History

Celebration of Día de los Muertos (Day of the Dead) evolved from the time of pre-colonial Aztec Indians to modern day Mexicans through the influences of Catholic Europeans whose celebratory rituals penetrated indigenous customs. Post-revolutionary art gave rise to a syncretic modern day Día de los Muertos that uses imagery such as sugar skulls, pastries, song, etc.; Mexico's traditional folk art was used in nation-building attempts to construct an image of "authentic" Mexico. In order to show how an image of "authentic" Mexico evolved, I compare primary sources from colonial priests to modern day social science analyses and folk art following the Revolutionary period.

America's Children Left Behind: The Amerasians of Vietnam

Ashley Elizabeth Miles

Michael A. Nelson, Ph.D.

Department of History

During the Vietnam War, an estimated 100,000 children were born to American soldiers and Vietnamese women. When the war was over, a lot of these women and their children were abandoned or simply could not be brought to the United States. As a result, the Amerasians faced much discrimination from their fellow Vietnamese. Not until the Amerasian Homecoming act of 1987, twelve years after the war, did the U.S. government make any significant efforts to help the Amerasians. This piece of legislation brought much needed change to Vietnamese Amerasians whose lives were characterized by abandonment, discrimination, poverty, and a lack of identity.

Tet: The Peak of the Credibility Gap

Laura Coleman Nickles

Michael A. Nelson, Ph.D.

Department of History

There is a long-standing argument that the media were a heavy-handed institution that led to American defeat in Vietnam. More specifically, media coverage of the Tet Offensive greatly influenced public support for the War. From 1965-1967, news media in the United States exposed cracks in what Lyndon Johnson was saying and what was actually happening in Vietnam. In journalism, this growing political and public discourse became known as the credibility gap. When the North Vietnamese launched their offensive in 1968, public approval ratings for the Johnson Administration's handling of the war quickly eroded.

The Gift of Gab: An Analysis of the Presidential Rhetoric Used in Correlation to the War on Drugs

Acey L. Palmer

Erin S. McAdams, Ph.D.

Department of Political Science

This research project is a study of the rhetoric expressed by President Obama, in regards to the War on Drugs, as compared to the rhetoric of Presidents Richard Nixon, Ronald Reagan, and Bill Clinton about the same topic. I hypothesize that the manner in which President Obama spoke on the subject is in a more decriminalizing manner, while the other three Presidents spoke of drug use in a more criminalizing tone. This research project will also illustrate how the way in which Presidents communicated policies during the ongoing “War on Drugs” could have been the cause for a drastic climb in the incarceration rates of minority prisoners.

A History of Gender Binarism in the DSM

Ryan Andrew Paquette

Emily L. Taylor, Ph.D.

Department of English

The objective of my study is to raise awareness of how the history of gender development in the United States has influenced the writing and construction of the DSM's. I research the history of gender's construction in the United States and map the role it played in the construction of the DSM. By analyzing how gender has been talked about in each time period surrounding the DSM's, I will be able to see how the vocabulary and views of gender in society are reflected in the DSM. I hypothesize that gender will have played a huge part in the creation of the DSM and how it has diagnosed gender variant or gender nonconforming individuals. My research will help people, especially psychologists, recognize that gender binarism has influenced the DSM and its diagnoses. In the future, I hope that people will apply my postgenderism views to change the DSM and thus reduce the number of individuals diagnosed with gender dysphoria. I would one day hope that postgenderism could be applied to society and in doing so it would reduce the amount of psychological distress people that are gender variant or gender nonconforming feel.

Southern Protest: The Vietnam Protest on Southern College Campuses

Vernon James Peterson

Michael A. Nelson, Ph.D.

Department of History

During the 1960s and 1970s, America was at war, The Vietnam War. The Vietnam War was unlike most wars because it did not receive widespread support. During the Vietnam War, many anti-war protests arose across the country particularly on college campuses. However, most attention has been put on the protests that took place on campuses in the North. So, that suggests the question what was the protest movement like on southern campuses? Protest on southern campuses increased after the Kent State massacre and were influenced by the Civil Rights Movement. These protest were both non-violent and violent and included teach-ins, rallies and in some cases, hostile take overs of academic buildings.

3D Prosthetic Modeling: A Study in Complementary Biomechanics and Electromechanics

Minhanh Trinh Pham

James T. Wetzel, Ph.D.

Department of Biology

My research on prosthetics has enabled Presbyterian College to join in the volunteer initiative of the e-NABLE program in 3D printing upper limb prosthetics for the disabled at a lower cost, through a service-learning, interdisciplinary program. My research has progressed to expand the capabilities of the current e-NABLE upper limbs in terms of the materials used to lead to individual digit mobility, such as with copper wiring, elastic, and non-elastic cords. This development holds promise to the incorporation of electromechanics to create the circuitry that will allow for individualized finger and wrist movement. In addition, I have successfully applied a layer of art molding medium to a 3D printed digit, which holds promise to create an artificial skin cover for the upper limb prosthetics with art molding mediums that will give the amputee a better sense of normality.

Autism Spectrum Disorder and Gut Dysbiota

Emily Claire Phillips

Evelyn J. Swain, Ph.D.

Department of Chemistry

The objectives of this research are to determine the effects of breast milk feeding versus formula feeding on the development of Autism Spectrum Disorder (ASD). More specifically, the research investigates the role of feeding on the neonatal gut microbiota. This research will entail a thorough literature review to determine how maternal factors are related to Autism Spectrum Disorder. The type of feeding method the neonate receives plays a large role in his or her well-being and health. In conclusion, my research provides evidence that breast-feeding is beneficial to infants' overall health, including the neonatal gut microbiome, and may play a significant role in the prevention of autism.

Conflict and Its Impact on Women's Representation in Developing Countries

Hayley N. Potter

Erin S. McAdams, Ph.D.

Department of Political Science

Intense conflict can have traumatic effects on populations that experience it. Conflict has the ability to break down the political, economic, and social structures of a society, but this breakdown can also transform the roles of women by allowing new spaces in politics to be opened to them. Does conflict, in fact, impact the percentage of women in the national legislature in developing countries? This research seeks to examine if a relationship exists between these two factors through qualitative and quantitative analysis. Case studies of Rwanda, Liberia, and Ghana were conducted as well as a statistical analysis of an original dataset to test the relationship between these two factors as well as control for various factors, such as electoral system, presence of quotas, GDP per capita, and regime type. It is expected that the findings will confirm some type of relationship between conflict and the percentage of women in the national legislature.

Coaching Cues on Motivation and Athletic Performance

Kathryn E. Richardson

Jay L. Michaels, Ph.D.

Department of Psychology

This study examined how a coach's level of instructiveness impacted athletes' intrinsic motivation during a cardiovascular conditioning session. It was investigated whether the presence of an instructional aspect increased intrinsic motivation and improved performance in athletes and if a controlling aspect decreased intrinsic motivation and hindered performance. It was hypothesized that the average times for the informational group would be faster and average effort exerted would be higher than for the controlling cued group. The effect of the type of verbal cues given was found to be significant. The data revealed that instructional cuing resulted in generally stronger performance.

My Lai and Wounded Knee: Two Massacres Committed by the United States of America

Joel Kelly Roberts

Michael A. Nelson, Ph.D.

Department of History

This study compares the My Lai massacre and the Wounded Knee massacre. There is a thorough investigation of events leading up to both massacres, what occurred on the day of each massacre, and what happened after each massacre took place. While there are some differences, these two massacres are easily comparable. Ultimately, this study shows the similarities of before, during, and after the My Lai massacre and the Wounded Knee massacre.

The Influence of Body Ideals on Athletes and Body Attraction

Erin E. Ruff

Evelyn A. Hunter, Ph.D.

Department of Psychology

Those outside of the general population, specifically athletes, must conform to body ideals that do not always match the thin body ideal typically adopted by the general public. Figural ratings have been used previously to examine body satisfaction in collegiate male athletes. Results suggest that athletes, influenced by coaches and teammates, tend to choose a personal body ideal and one most attractive to the opposite sex that is more muscular than their current body size. This researcher examines the differences between collegiate athletes and the general college population on body ideal and attractiveness measures. This study will utilize figural rating scales in order to identify the current body ideal and body dissatisfaction levels of college students (both collegiate athlete and non-athlete). Additionally, the research will use a general demographics survey, the BIG-O, the Curvy Ideal Body Image Scale, and the Body Image Disturbance Questionnaire (BIDQ) to explore the body type that each individual finds most attractive with an aim to identify whether a similarity exists in personal body type ideal and body type attractiveness ratings.

Induction of P-glycoprotein in Caco-2 Cells

Nicole Siciliano and **Lisa Gibbs**

Christopher Farrell, Ph.D.

Department of Pharmaceutical Sciences

Multidrug resistance (MDR) is a huge barrier to cancer treatment with chemotherapy and targeted therapy. Overexpression of the protein transporter P-glycoprotein (P-gp) has been shown to be a major contributor to MDR. Certain P-gp substrates, such as anticancer agents, have been shown to induce MDR in cancer cells. We investigated if the P-glycoprotein substrates losartan and citalopram would induce P-gp overexpression in Caco-2 cells, a colorectal cancer cell line. The cells were monitored for P-gp overexpression by quantitative RT-PCR. Previous studies have shown induction by vinblastine (our positive control) to occur around month 9; therefore, our project is still on-going.

What Did I Just Say? An Investigation into Memory Processes during Speech Production, a Pilot Study

Kayla A. Stanford

Sarah C. Burns, Ph.D.

Department of Psychology

This is a pilot study investigating the functioning of memory for one's own speech. Specifically, we will be attempting to determine the properties of memory formation during speech production. Memory research, historically, has used prompts for participants to recall, then the recall is compared to the prompt and conclusions are drawn. We are investigating if participants can recall their own speech production along several variables (word choice, word count, semantic content, etc.), after generating their own prompts. We hypothesize that the working memory used in speech production will disrupt the processes involved in memory formation.

Characterization of the Mitochondrial Pyruvate Carrier in *Saccharomyces cerevisiae*

Matthew Joel Treaster

Evelyn J. Swain, Ph.D.

Department of Chemistry

The mitochondrial pyruvate carrier (MPC) is a multimeric transport protein found in the inner mitochondrial membrane responsible for the uptake of pyruvate into the mitochondrial matrix. Due to the integral role of pyruvate in the formation of acetyl-CoA, this transport protein is of great significance to eukaryotic cellular metabolism. Using *S. cerevisiae* as a model, this research characterizes the MPC and its impact on metabolism through the use of various techniques including bioinformatics analysis, fluorescent microscopy, and a synthetic lethal screen.

Coloring Graphs

Abigail M. Waldron

Kara L. Shavo, Ph.D.

Department of Math

A given graph G is a k -coloring graph if its vertex set is the proper k -colorings of the vertices of G . Two k -coloring are adjacent if and only if they differ at exactly one vertex. A given subgraph, H , can be considered either permissible if it can be found as an induced subgraph of G or forbidden if it cannot. This research will focus on discovering and proving forbidden subgraphs of coloring graphs.

Coronal Mass Ejection Relationships

Brien Timothy Washington

James T. Wanliss, Ph.D.

Department of Physics

Over the past few months I have been studying the Coronal Mass Ejection (CME) data from Nasa's SOHO LASCO CME Catalog. A CME is an ejection of gas and or plasma, laced with magnetic field lines, coming from the Sun's corona. The ejection itself can take several hours to complete, and can take up to five days to reach Earth. A CME's speed can be calculated as a linear or quadratic function, solar radii (radius of the sun), and its mass can be guessed in order to calculate its kinetic energy. With these data, which range from January of 1996 to July of 2015, I have been trying to find consistent patterns in the previously mentioned variables, along with angular width and acceleration. A notable pattern I plan on elaborating on is the relationship that each variable's, save time, histogram reveals.

Retention of Conflict-Induced Avoidance Behavior in Male Syrian Hamsters

Destiny Alexandria Willis

J. Alicia Askew, Ph.D.

Department of Psychology

Social conflict, a type of social stress, can be seen in daily life as two or more individuals oppose each another in social interactions wherein a dominant-subordinate relationship is established. This experiment used the Conflict Alleyway to investigate the long-term retention of post-conflict avoidance in defeated male Syrian hamsters. The aim of the experiment was to determine whether equating the number of defeat experiences would yield long-term retention of avoidance when tested 7 and 14 days after post-defeat trials. It is possible that the apparatus used in this study, the Conflict Alleyway, might be utilized to establish a model of recurrent stress.

A (Fe)Males Game: A Comparison of Gender Stereotypes and Image in Congressional Campaign Ads

Robert D. Willm

Erin S. McAdams, Ph.D.

Department of Political Science

This paper will build on the seminal work conducted by Kim Kahn more than two decades ago. Kahn's work concluded that gender stereotyping occurs anytime a female runs for any type of office. However, there has not been very much scholarly work that has examined these conclusions since then. In an attempt to fill this void in literature, I will conduct a content analysis of congressional campaign ads from the 2014 Senate election, comparing the ways in which male and female candidates (of the Republican and Democratic parties) address gender stereotypes in their campaign images. This research will build on the past work that has been done and test whether the previous conclusions hold true today.

An Analysis of the Relationship Between Americans' Party Identification and Attitudes Towards Normalizing U.S.-Cuban Relations

Steven A. Wohlrab

Erin S. McAdams, Ph.D.

Department of Political Science

This paper investigates the influence that party identification of the American public has on attitudes towards the normalization of relations between the United States and Cuba. Analyzing and interpreting survey data from the Pew Research Center, this research project will conduct bivariate and multivariate regression analyses to determine whether Democrats are more in favor of normalizing relations with Cuba in comparison with Republicans. The results of this study are expected to demonstrate the effect that party identification of America's citizenry has on attitudes regarding the normalization of U.S.-Cuban relations.

Music Honor Recital Honorees

Edgar L. Alford, junior, guitar

Seth M. Brown, junior, doublebass

Lindsey E. Gardner, senior, soprano

Sara Walden Hanna, senior, soprano

Gabriela J. Lewis, senior, cello

Collin J. McKinnon, freshman, cello

Emlynn L. Shoemaker, sophomore, mezzosoprano

Hannah M. Taylor, senior, soprano

Fine Art Senior

Shonquille Byers

Mark R. Anderson, M.F.A.

Department of Art

At a young age, I realized I had some artistic ability. Many nights I would stay up drawing, practicing day in and day out until I got better. Art has always been something I like. I hope my art will inspire someone one day. I feel deeply connected to my art.

As an artist, I work hard to develop paintings that speak to me and others about the circumstances that athletes face in today's society. Being a football player myself, I see and hear a lot that goes on around the sport, both the negative and positive thoughts and actions. My work is a constant search for the best way to interpret these ideas, ideas I have about himself, and some coach-player relationships.

In my paintings, the athlete is often depicted as a pawn trying to escape, or getting controlled by the coach, manager, etc. Playing college football, I saw a lot which made me think: Do coaches really care for athletes? Are they just using those athletes? Are the athletes just pawns to the coaches, someone they can move here and there for someone else's benefit? If the athlete does not play well, or the team has a losing season, often times the coach will lose his job. So is he just moving the athletes in certain directions to help his case?

The paintings that are on display vary in size. They are done in a stylized manner. They are done in acrylic paint on canvas. Often I struggled with blending the fast drying acrylics. But I chose this medium because it gives a harder edge to my paintings. The hard edges and dynamic lines help create action and movement, which makes it easier to simulate a football game. I tried to give the viewer that feel.



Pawn

Fine Art Senior

Melissa Coward

Mark R. Anderson, M.F.A.

Department of Art

I started down the path that led to my recent work by studying the insides of oyster shells; I found that the inner world that once contained the life of the sea mollusk held a certain kind of captivation over me. The combined effect of the smooth surfaces and the organic flowing forms within the deeper pit of the shell presented itself as a small world for me to work in and explore. By looking closely into the micro spaces of a natural form, in this case, the tiny inner world of an oyster, I am inspired to create a virtual world or space projected on the macro level, amplifying it into a habitable space for human contemplation. My work holds a mystery within it, like it is hiding something, or inviting the viewer into an unexplored world. It presents enticing spaces that flow towards the viewer, pulling them through the work, drawing them deeper into it, through dark, cave-like crevices, which have an enigmatic aspect about them, toward a place just behind the last place the light falls upon, just beyond what the eye can see.

These painted worlds are rich in the energy and emotion they put forth. The folds and sensual nature of the work evoke a strong feminine energy that, while initially unintentional, have become a key force, giving rise to the expressive power of my paintings.

I am largely inspired by the modernist work of Georgia O'Keeffe, as her art shares a similar nature to my own. This influence is noted in the cropping of the subject matter, as well as in the nature of the forms as well as the energy and movement the work portrays.



Carve

Fine Art Senior

Sarah Downie

Mark R. Anderson, M.F.A.

Department of Art

My fascination with cultures from around the world emerged when I was very young. I was raised with both Scottish and American cultural influences. As soon as I was old enough, I signed up to go on a mission trip to Peru, which was my first trip out of the country. Since then, I have traveled to Scotland, England, and Italy.

Ultimately, the primary thing behind my interest in cultures is probably the fact that I am adopted and don't have very much information on my birth parents. At first I was bothered by the fact that I didn't know my ethnicity. Over time I realized that there is beauty in not knowing, because I am not restricted in my ethnic or racial identity. I am free to identify with all races and to explore all cultures.

In my art I wish to make reference to the idea of primitivism while at the same time incorporating modern techniques. I choose to work on un-stretched canvas because it helps me to visualize the work as cloth or even a cave wall, because the borders are less defined than on stretched canvas. I really enjoy making interesting backgrounds that involve different techniques and textures. Painting a harder, more concrete foreground, over of a softer abstract background creates for me a balance between abstract and figurative art.

The artists and pieces that I find most inspiring are works like Georgia O'Keeffe's skull paintings and Jackson Pollock's drip paintings. I've also found a lot of my inspiration in ancient cave paintings, ceramic vessels, masks, headpieces, and animal skulls. These are interesting because they are what remains of those people and animals that used to be and are now gone.



In Memory

Fine Art Senior

Ben Roach

Mark R. Anderson, M.F.A.

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The art world needs more humor in it. The world of conceptual art has become increasingly confusing and often times, meaningless to me. My art has progressed into making fun of the modern conceptual art movement and the overreaction of a piece's importance simply because of an artist's name. While my ideas are similar to pieces that have landed spots in world-renowned museums and galleries, mine will not because my name is not known by millions and viewed as collectible.

I don't identify myself as a painter, or a sculpture, or a photographer. I would rather call myself a visual comedian. If that means taking a found object and changing its meaning, like Marcel Duchamp did in his piece "Fountain," then that is what I'll do. Other projects may need to be painted or photoshopped. Either way, making someone laugh and see a lighter side to the art world does not need to be limited to a specific medium like canvas or a slab of clay. Sometimes I simply have an idea as to what kind of joke I want to make and I look until I find an object or image that has the potential to take on a life of its own. A lot of my inspiration has come from visiting galleries in New York City that have displayed pieces by Marcel Duchamp and Ricci Albenda.

I strive to make every viewer realize that not all art is important simply because of the artist that created it. Great art is not limited to a select few whose names have been around for years and years. The importance of an object should not be overlooked solely because of an artist's portfolio, but rather the quality and meaning behind each piece.



Tighty Whities

Fine Art Senior

Yvette Whiteman

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Magical is defined as beautiful and delightful in such a way as to seem removed from everyday life. As an artist and human being, I want to create art that not only has a magical quality but, inspires magic in other people.

The innate sense of magic we are born with, has always intrigued me from the time I was child. Being from Florida, and visiting Disney World all my life, I think the sense of magic like seeing princesses, castles, or hearing fairy tales I gained as a child has not quite left me and is frequently visible through my art.

As I began creating, I struggled with what I was doing, whether it was my inner critic or having a creative block. All I knew was that I wanted to create something worthwhile.

My work invites the viewer into my view of how magical and beautiful the world is. I use modeling paste to create interesting abstract textures on canvas, which I later emphasize with paint and glitter. I use glitter to add a hint of enchantment and wonder for the viewer.

I look at the texture created by plants and trees and other forms of nature to inspire the abstract forms I use in my pieces. Another influence is how I see the world around me. I believe the world is a tactile place and I take that approach to my art. I also look to art history for inspiration, artworks by Fragonard, Monet, and Van Gogh. I create these textures with palette knives and with my hands. This more tangible approach, allows me to connect more to my art and the media I use.

Creating abstract textures also allows the audience to enter my world without being conscious of it. I want my art to inspire others to experience the magic of their own interpretation without the interfering overtone of the artist.



Gilded Rose