



April 17, 2015

Dear Faculty, Students, and Guests:

It is a pleasure to welcome each of you to the Presbyterian College Honors Day Symposium. As a member of the Council on Undergraduate Research, the College values research and its integral part of the educational process.

The opportunity for students to explore their intellectual interests and to develop concomitant solutions is critical if society is to address today's challenges and to prepare for the future. Research—particularly at liberal arts colleges—allows innovative scholarship at a very high level.

I am delighted to have an opportunity to recognize the students listed in this abstract book. These individuals have committed themselves to an endeavor that is special. Equally important is the support provided our students by their faculty mentors. Without the commitment and dedication of the faculty, there would be no research program. I congratulate the students and applaud the faculty who support them.

You and I have the privilege of enjoying the results of our students' efforts, thereby providing them with practical experience in sharing their work and creative activity. We have an opportunity to evaluate each participant's project and to be inspired by what a PC academic experience can produce. Following these presentations, please join us at the Honors Convocation in Belk Auditorium.

Welcome to Honors Day.

Sincerely,

A handwritten signature in black ink, appearing to read 'Claude C. Lilly', written over a light blue circular stamp.

Claude C. Lilly
President



April 17, 2015

Members of the Presbyterian College Community:

Honors Day is an important day in the academic life of Presbyterian College. We set this day apart from others in the calendar to emphasize particular academic and creative accomplishments of our students. The projects you see in this booklet reflect exciting ventures that students pursue with faculty mentors in the College of Arts & Sciences and the School of Pharmacy. As students engage in research and creative activity, they enhance their academic abilities and develop the initiative required to pursue with excellence their areas of interest.

Students have the chance to engage 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 present papers, engage in performances, participate in shows, and compose publications. Each of these opportunities provides a way to celebrate different achievements, yet students also receive important, 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 2015 Honors Day Symposium, and congratulations as well to the faculty members who have mentored or supervised those students who are presenting their work today. Let me also offer my appreciation 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 2015 Honors Day Symposium!

Sincerely,

Donald R. Raber II, Ph.D.
Provost

HONORS DAY SYMPOSIUM

PRESBYTERIAN COLLEGE
APRIL 17, 2015

The Effects of Religion on Parenting Styles

Austin D. Allen

Robert H. Freymeyer, Ph.D.

Department of Sociology

This research examines the relationship between religion and parenting styles focusing on how parents' religiosity influences the way they choose to punish their children (i.e., corporal punishment or other forms of non-physical punishment). Secondary analysis is used to examine information found in the 2012 National Opinion Research Center (NORC) General Social Survey (Davis, Smith, and Mabrey, 2012). I hypothesize that parents with a higher level of religiosity are more likely to use corporal punishment to discipline their children. This research helps us understand whether religious parents really believe the phrase "spare the rod, spoil the child."

Repackaging Mammy: The Evolution of Aunt Jemima & the Mammy Figure in Popular Culture

Abbie E. Bagwell

G. Terry Barr, Ph.D.

Department of English

In conducting research this summer, I sought first to ground myself foundationally in the definitions, traits, and attitudes surrounding the stereotype of the mammy figure historically- and culturally-speaking. Who is Mammy, and why is she significant? Once gaining a better understanding of her origins, I then segued into researching how her stereotyped caricature has been perpetuated through literature, advertisements, film, television, and radio. The goal is to gain an understanding of the material ways in which the mammy figure has been commercialized for mass consumption in the past with an eye on present cultural trends. Such trends include, but are not limited to, costuming and party culture that involve the use of blackface and the continuing successes of companies like Aunt Jemima. Connections exist between advertising of the past and current prevalent attitudes, products, and advertisements that contain traces of the mammy figure stereotype or, at the very least, evidence of the influence she might still be yielding even today.

To Vote or Not to Vote; That is the Question: Comparing Political Engagement Levels and Voter Registration & Turnout Rates by Generation

Mary Kate Bartlett

Erin S. McAdams, Ph.D.

Department of Political Science

Many individuals across the United States vote in Congressional and Presidential election years; however, different groups of people tend to turnout to vote at higher rates than others. Specifically, previous research has found that differences in levels of voter turnout and registration levels are related to their levels of political engagement. This research project will contribute to previous research by examining the differences of this impact between generations. By examining data from the American National Election Studies Time Series Study, this project compares the effect of levels of political engagement on levels of voter registration and turnout for the Silent Generation, Baby Boomers, Generation X, and the Millennial Generation.

A Tooth Microwear Analysis of Fossil and Recent Herbivores

Lauren E. Berkey

Michael O. Rischbieter, Ph.D.

Department of Biology

Microwear analysis of fossil teeth has become one of the new and innovative ways that paleontologists can determine food sources for early Cenozoic herbivorous mammals. Modern herbivores utilize a number of plant sources, including fruits, seeds, stems, leaves, bark, twigs, and for specialized ruminant grazers, grass. Each plant source will leave a distinctive scratch, pit, or other impression on tooth surfaces. For this research, maxilla from two modern herbivores were chosen as controls: *Lama glama* (llama), which feed on forbs, lichens, tree foliage, native shrubs, and young and tender shoots, and *Odocoileus virginianus* (white tail deer), which eat mostly grasses, herbs, crops, fruits, leaves and twigs. Fossil herbivores included two *Oligocene oreodonts* (*Merycoidodon sp.*), one from Wyoming and the other from Nebraska, and an *Oligocene rhino* (*Subhyracodon sp.*) from Wyoming. To prepare the teeth for analysis using the scanning electron microscope (SEM), the number eight and nine facet were cleaned with isopropyl rubbing alcohol and impressions were taken using dental grade poly-ether, and then cut into small fragments and mounted on stubs and sputter coated to be used in the SEM. SEM was performed on a sample from each animal, and images were analyzed to determine eating habits. An analysis of these high-quality images indicates that the fossil herbivores were feeding on similar food sources with the exception of grasses.

Satellite Remote Analysis of Fractal Patterns

Denzel R. Brown

James A. Wanliss, Ph.D.

Department of Physics

My research stems from an interest in fractal patterns of natural phenomenon. Fractal patterns are defined as patterns that repeat themselves on every scale and are generated in several places naturally here in our world. In my research I will develop a computer model that uses machine vision to estimate disease parameters using the human methodology as a baseline. Analyzing image patterns can yield results that allow for the data detection of distant locations, including satellites miles away. I will be attempting to find patterns which would benefit remote satellite missions.

Acoustic Pulse Transmission through Granular Materials

Denzel R. Brown

Eli T. Owens, Ph.D.

Department of Physics

We encounter granular materials daily, from sugar to the rings of Saturn. Even the Earth's surface is composed of a granular material, and a better understanding of granular physics could be used to probe the Earth's surface with sound waves. However, granular acoustics have much complexity due to the fact that the particle placements are disordered, leading to a disordered internal force structure. The goal of this research is to efficiently maximize signal transmission through these disordered granular systems. For my project, I confined sand in a box and excited a pulse of sound and measured how the granular material responded.

Exploring the Chasm: The Dysfunctional Family in Southern Literature

Cameron R. Brock

G. Terry Barr, Ph.D.

Department of English

One of the more prevalent themes within Southern literature is that of the family and the purpose it serves in driving certain characters forward - or holding them back. Often this rift between family members, particularly in the South, stems from many of the “issues” plaguing the South - issues that were common in the years following the Civil War and still dominate in literature of a more recent time period. Analyzing the works of William Faulkner, Flannery O’Connor, and Toni Morrison provides a reader with many of those issues within the texts - especially issues of pride and propriety as they are specific to the South. Through these texts, one can glean that many of the problems arising within the Southern family grow out of the roots of the issues plaguing the South as a region in general.

Stately Scriptures: Martin Luther's German Bible's Impact on German Nationalism

J. Christopher Byrd

Richard R. Heiser, Ph.D.

Department of History

Martin Luther's translation of the Bible, both the Old and New Testaments, into German combined humanistic scholarly techniques with incredible literary acumen to produce one of the greatest works of sixteenth century literature. Within Germany, it aided both in advancing the message of the Protestant Reformation and in establishing a common vernacular language for most Germans. Therefore, by capitalizing on the rather new ability of the printing press to reach an unprecedented number of people, and through its superb quality, Luther's German Bible played a central role in the solidification of German cultural and political unity and in Germany's transition to a modern nation.

'Now begin the terrors; now begin the marvels:' The Sacred and Secular Grail in the Twentieth Century

J. Christopher Byrd

J. Justin Brent, Ph.D.

Department of English

The Holy Grail began its literary life in Chretien de Troyes' unfinished twelfth century romance Percival and over the next 800 years became associated with both the Christian cup of the Last Supper and ancient pagan fertility rituals. The Grail's significance further developed from a story about a young knight reaching maturity to the ultimate quest to find perfection, God, and to heal a wounded land. Twentieth century American and British literature marked perhaps the most vibrant time in the Grail's legend. Its ambiguous origins coupled with a world seemingly always racked by violence and unrest combined to produce works that profoundly commented on the conflict between an increasingly secular present and a more spiritual past. From didactic morality stories of the early twentieth century to complex poems of the World Wars to mystic feminist Grails and ones guarded by killer rabbits, the legend of the Holy Grail proved its relevance in a different world from which it was imagined. Though the Grail never seems able to completely lose its Christian connections, even in the twentieth century, it nevertheless was adapted to fit a host of writers' viewpoints. Yet, in spite of all the different approaches that were taken to the Grail's legend, it continued to be, for many twentieth century writers, the object and metaphor that best encompassed their time's struggle between the known, secular world and a mysterious, sacred realm, between what is practical and what could be possible, and between the undeniably terrible and the spellbindingly marvelous.

The German Peasants' War of 1525: Causes and Results

Justin Scott Campbell

Dr. Richard Heiser

Department of History

The German Peasants War broke out in 1524 and lasted through 1525. My concentration will be on the Upper Swabia region, located in central Germany. My main focus in my research will be the causes of the uprisings in this specific area and reasons for the peasants failed attempt to revolt against the nobility.

Synthesis of Novel 3'-C-Puromycin Analogs as Novel Non-Nephrotoxic Antitumor Antibiotics

Joshua A. Carter

Giuseppe Gumina, Ph.D.

Department of Pharmaceutical Sciences

Puromycin is a natural peptidyl nucleoside antibiotic that has the potential to be synthetically altered to become a potent anticancer and antimicrobial drug. Puromycin is metabolized in the body into a nephrotoxic metabolite, but our recent studies have shown that altering the amino acid portion of the nucleoside can stabilize the drug and preserve its original properties without becoming toxic. Preliminary studies showed that the amide functionality of puromycin is not required for activity, and its replacement with a ketone generated an active but chemically unstable analog. In current developments, we designed an update analog containing an amide-mimicking hydrazide functionality.

Drug Diversion in the Operating Room: Exploring Novel Techniques of Diversion Detection

John Mark Dias, II

David H. Eagerton, Ph.D.

Department of Pharmaceutical and Administrative Sciences

Drug Diversion is a growing concern of hospitals nationwide. Medications for surgeries, including narcotics, are dispensed from and disposed of inside the Operating Room pharmacy. In diversion, syringes are often filled with normal saline or water before being brought back to the pharmacy for disposal after the medication has been stolen. Testing the syringes after they are brought back from surgery is critical in ensuring that the syringes contain medication and not another substance.

Spectroscopic techniques have been proven useful in detecting tampered syringes. We used Surface Enhanced Raman Spectroscopy as a novel method of determining syringe content and medication concentration.

Drug concentrations as small as 50mcg/ml were detected using silver nanoparticles in solution. The results require further validation with more medications, concentrations, and confirmatory testing.

Themes Across American Food Literature: A Cultural Consciousness

Helen J. Dennis

G. Terry Barr, Ph.D.

Department of English

American food culture can be studied through a number of lenses, one of which is non-fiction literature. The most common form of this genre is perhaps the cookbook, but it also includes memoirs, and historical and cultural studies. Despite the majority female, middle-class, and heterosexual authorship in this field, there are writers who stand out in the food literature world and define American food culture for themselves. The presence of themes across the genre of non-fiction, American food literature show that the recent expansion in this field is working towards defining American food culture as being more intentional and inclusive.

Determining Behavior of Hxt Glucose Transport Proteins in *Saccharomyces cerevisiae* Using Modern Cloning Techniques and Bioinformatics Methods

Christopher R. Downey

Evelyn J. Swain, Ph.D.

Department of Chemistry

Yeast, *Saccharomyces cerevisiae*, serves as a very powerful model system used in research to study a profusion of cellular processes because of their quick reproduction cycle and acceptance to genetic modifications. The full mechanism of glucose sensing and signal transmittance in eukaryotic cells is not fully understood. What is understood, is that yeast have glucose sensing mechanisms that involve expressing and mobilizing glucose transporter proteins to the plasma membrane in order to uptake glucose. Yeast cells are able to maintain homeostasis by effectively regulating these glucose transporters, however, the full mechanism of this regulation is to be determined. The structure of proteins have often helped scientist elucidate the method in which proteins function. Previously, there were no 3D models of these transport proteins, but using the Phyre2 prediction software, the first 3D models have been generated with high accuracy. These models are being used to give a better understanding of the behavior of the yeast glucose transporter family of proteins. It is my hypothesis that predicted phosphorylation sites along with intracellular N- and C- termini play a vital role in glucose sensing and uptake.

Submissive Behavior and Learned Avoidance in Male Syrian Hamsters

Hannah D. Fulenwider and **Bailey M. Hill**

J. Alicia Askew, Ph.D.

Department of Psychology

Conflict between adult male Syrian hamsters typically leads to the formation of a submissive-dominant relationship and avoidance behavior. To investigate the relationship between the frequency of submissive behavior and post-defeat avoidance behavior, previously recorded conflict trials were scored using a new behavioral scoring program. Our goal was to validate the program, establish reliability measures, and analyze data that were obtained using the new program. These analyses indicated that the frequency of defeated subjects' submissive behavior did not influence post-defeat avoidance. However, repeated and extended exposure to conflict may play a role in the magnitude of the avoidance response.

Aesthetic, Philosophical, and Emotional Instability in José Asunción Silva's "Nocturno"

Hannah D. Fulenwider

Clinia M. Saffi, Ph.D.

Department of Modern Foreign Languages

José Asunción Silva, a nineteenth century modernist poet from Colombia, is well-known for his lyric and expressive poetry. This study applies the various perspectives about the complexity of death and depression, and the effects of such on an individual within the context of Silva's poem "Nocturno." The aim of this study is to explain the dichotomous nature the Latin American modernist style and the resulting instability of this contrast, which manifests itself aesthetically, philosophically, and emotionally throughout Silva's work.

Defeat Frequency and Learned Avoidance in Male Syrian Hamsters

Hannah D. Fulenwider and **Destiny Willis**

J. Alicia Askew, Ph.D.

Department of Psychology

Male Syrian hamsters are useful in studying social conflict due to their territorial nature. Male hamsters that have experienced social defeat during a conflict trial typically exhibit post-defeat behaviors that include a learned avoidance of their dominant opponent. While previous studies have examined the effects of factors such as defeat length and opponent familiarity on acquisition of learned avoidance, this study will examine the number of defeats necessary for learned avoidance to be established. Specifically, the goal of this experiment is to determine the number of conflict trials necessary to achieve learned avoidance in at least 75 percent of the subjects.

The Impact of Calvin's Theology on Capitalism

James D. George, Jr.

Richard R. Heiser, Ph.D.

Department of History

Authors such as Max Weber have made a connection between Calvinism and capitalism. This project seeks to find the relationship between John Calvin and capitalism and identify any effects Calvin had on economic theory. Modern Capitalism did not exist during the time of Calvin, but he still offers opinions on economic ideas in his writings on biblical texts. These works, as well as a selection of secondary sources, will be examined and presented to explain how Calvin impacted the proliferation of Capitalism.

Four Years of CHAMPS Data: How Has the First Cohort Changed Over Time?

Britnee K. Goldman and **Jonathan T. Mitchell**

Brooke C. Spatta, Ph.D.

Department of Psychology

Four years of longitudinal data collected from the students in the CHAMPS program were analyzed to search for significant changes in the variables of interest over time. Analyses revealed significant decreases in both peer-reported externalizing behaviors and self-reported preoccupied attachment style, whereas perceptions of maternal harassment showed a significant increase over time. Increased reports of perceived harassment are typical in adolescents during their search for autonomy, so this result was to be expected. The significant reduction in maladaptive behaviors and insecure attachment suggests that the CHAMPS program is having a positive impact on its students.

Witchy Women: The Salem Witch Trials and the Influence of Colonial Society

Rachel J. Gundaker

Anita O. Gustafson, Ph.D.

Department of History

As New England became more established throughout the seventeenth century it saw waves of immigration; each new wave brought with it new ideas and beliefs. One group of immigrants, the Puritans, saw a safe haven for their beliefs in New England. However, with the emergence of new and progressive ideas that challenged traditional Puritan ways, community leaders of Salem, Massachusetts took drastic measures to unite the community around a common cause, the eradication of witchcraft. Faulty evidence and zealous community involvement led to the imprisonment of hundreds and the death of twenty. These events came to be infamously known as the Salem Witch Trials of 1692.

Exploring the Complexity of Space Weather Using 210 mm Data

Pravin Gurung

James A. Wanliss, Ph.D.

Department of Physics

In the decades since the Apollo Mission the space age has revealed even more about “space weather” – the electromagnetic and plasma conditions around Earth that can cause problems for satellite and ground-based technologies, and even astronauts. Auroras overhead are the most visible manifestation of space weather. The most prominent space weather events are called space storms. When a space storm strikes the earth, there are no signs such as a shaking of the ground, but there are spectacular changes in the electromagnetic conditions around Earth as its magnetic field lines are twisted and shaken by the buffeting from solar particle and electromagnetic effects, and auroral conditions can be extreme. Space storms attack the very foundation of our high-tech infrastructure as they interfere with, and frequently damage, things electrical. The Space Weather Undergraduate Research Lab at Presbyterian College explores the fractal qualities of the geomagnetic field while it shakes under the influence of solar buffeting. For this project, a series of ground-based magnetometers were employed from the Japanese ‘210 mm’ array. This involved searching for quiet and active space weather conditions, then characterizing changes in the nonlinear statistics of the geomagnetic field via measurements of fractal scaling.

Greedy Algorithms - An Analysis of Their Effectiveness

Andrew D. Hane and **Bryan C. Hopper**

Kara L. Shavo, Ph.D.

Department of Mathematics

Our research investigates greedy algorithms, mathematical methods in which each step is decided by the best possible choice without backtracking to previous steps. We look into various forms of greedy algorithms, including algorithms for the Traveling Salesman Problem, making change in arbitrary currency systems in fewest units possible, and Egyptian fractions, and why these algorithms sometimes fail spectacularly to produce the global optimization. Particularly, we demonstrate proofs for Prim's and Kruskal's algorithms on spanning trees, and analyze our pseudo-code for these algorithms to find the worst-case scenario time growth rate. We then write code using random generators to produce adjacency matrices and run computer trials to test these growth rates experimentally.

The Impact of Human Resource Practices on Innovation

Hendrik S. Hagedorn

Suzanne J. Smith, Ph.D.

Department of Economics and Business Administration

Research so far seems to have proven a link between human resource practices and organizational performance, which considers innovation mainly in an indirect fashion. It is obvious therefore to assume a link between innovation and organizational performance. This leads one to connect HR practices directly to innovation, which already has been shown in several research papers. In this paper, the literature on the role of HR practices for explaining innovation outcomes is organized and discussed. The impact of individual HR practices on innovation as well as how the clustering of specific practices matters for innovation performance is investigated. This paper shows also, that recent research doesn't share a common opinion on the specific set of HR practices and the impact of some individual HR practices.

Luther, Marriage, and Society

Mary Catherine Heard

Richard R. Heiser, Ph.D.

Department of History

Throughout his letters, sermons, and publications Martin Luther wrote on the sacrament of marriage, marriage of clergy, celibacy, family roles, and the law of the land. Martin Luther viewed marriage as a secular institution as well as a religious one. He made efforts to bring about many liberal reforms to it that impacted European, particularly German societies, by helping to bring change to social, gender, and political roles in households, church communities, and regional provinces through his marital doctrines and beliefs. Humorously enough he dreaded teaching on the subject of marriage despite his noteworthy opinions on the subject.

Cytokine mRNA Levels in Macrophages Over Expressing CD163

Bailey M. Hill

E. Alfonso Romero-Sandoval, Ph.D.

Department of Pharmaceutical Sciences

In order to study inflammation in the context of chronic pain, we studied the mRNA expression of pro-inflammatory and anti-inflammatory cytokines in THP-1 macrophages exposed to an inflammatory stimulus. mRNA was measured using RT-PCR. We then tested the efficacy of Polyethylenimine (PEI) nanoparticles grafted to a mannose ligand (mPEI) and conjugated with a CD163 plasmid (pCD163) in changing cytokine mRNA levels. mPEI protects the gene from degradation, specifically targets macrophages, and produces low cytotoxicity. We measured the mRNA levels of the cytokines after 24 and 48 hours of incubation with mPEI+pCD163 or mPEI+empty vector (pEmpty). We hypothesized that the induction of CD163 via mPEI would upregulate anti-inflammatory cytokines and down regulate inflammatory cytokines. Our results suggest 48 hours of incubation with mPEI+CD163 was sufficient to significantly increase CD163 mRNA.

Racial Bias in the Context of Natural Disasters Amongst Paid Participants

Harrison R. Hopkins

Sarah C. Burns, Ph.D.

Department of Psychology

Continuing research from Spring 2014, racial bias was examined in the context of natural disasters. Participants were asked to take a survey during which they read a scenario about a woman experiencing a natural disaster and rank potential actions for her as acceptable or unacceptable. The implied race of the woman was randomized for each participant by changing the name of the woman in the scenario to one previously shown to be reliably stereotyped to a specific race. Two variations of this study were run, one which included family and education background (a replication of the Spring 2014 research) and one without any extraneous descriptors. No significant differences were found in the survey that included these descriptors. In the variation without familial and education information, significant differences between the 'black' and 'white' actors in the scenarios, with the actions of the 'black' actor being significantly lower ($M = 50.38, SD = 8.15$) than those of the 'white' actor ($M = 54.75, SD = 7.60$). No significant differences were found between either of those and the 'Latina' actor ($M = 53.92, SD = 7.18$).

Factors Influencing Racial Bias

Harrison R. Hopkins

Sarah C. Burns, Ph.D.

Department of Psychology

Continuing research from Summer Fellows 2014, racial bias is being examined in the context of natural disasters. Past research has found participants rate the potential actions of a black woman as less acceptable than those of a white woman in the wake of a hurricane and that including information about the woman's family and education background (married with children and in medical school) seem to counteract this effect, resulting in actions being judged similarly. Research further examines this effect by including a picture of the woman along with the scenario in the survey. Including this picture is expected to widen the gap between the rankings of the scores between the white woman and the black woman by making implied race more explicit and thus activating subconscious racial bias more strongly.

Robert Browning's Exploration of Truth in "The Ring and the Book"

Danielle F. Jolly

Jerry J. Alexander, Ph.D.

Department of English

A common trope within much of Robert Browning's work is the idea of what truth really is. By definition, truth is immensely subjective and changes from person to person. Likewise, how someone offers information to another to evoke thought is influenced by the biases of the individual doing the offering. The reasons behind presenting certain information and omitting other information can influence how the one receiving the information perceives it. Browning goes against the ideas of his contemporaries by offering these ideas in his epic poem "The Ring and the Book." After a close reading of this work, a question appears: how does Browning's ideas on the role of the artist, and what art does, reinforce the complexity of what truth is? When regarding Browning as a poet or artist of a work, one is able to utilize the subjectivity of truth in ways that induce the reader to consider what influences our conception of truth. Ultimately, various aspects contribute to the before-mentioned subjectivity: biases of the receiver of the information, motives of the one giving information or confessing, and the role of the artist or poet in exploring and shaping the presentation and reception of said information.

Economic Impact of Pharmacist Services in the Community Setting

Nadia I. Jubran

Kayce M. Shealy, Pharm.D.

Department of Pharmacy Practice

This literature review seeks to determine the economic impact of providing clinical pharmacy services in a community setting. Interventions included clinical pharmacy services, patient centered care, health testing/screening, cognitive pharmacy services, comprehensive medication review, consultations, OTC recommendations, outpatient pharmacy services, disease state management, medication therapy management, wellness program, immunization services, pharmaceutical CARE, target drug program, and drug appropriateness. Outcomes included cost benefit, cost effectiveness, cost analysis, cost avoidance, cost, and reimbursement. Included articles measured costs to provide services and/or economic outcomes. Thirty-three of the articles were included for this review.

A Microscopic Study of the Gonad Development When Exposed to Triclosan in Live-Bearing Fish, *Poecilia latipinna* and *Xiphophorus maculatus*

Emily M. May

James T. Wetzel, Ph.D.

Department of Biology

This study evaluated potential developmental effects of the chemical, triclosan (TSN), on the embryos and larval stages of the live-bearing fishes, *Poecilia latipinna* and *Xiphophorus maculatus*. TSN is an antibacterial agent commonly found in cleaning products, is used as an additive in plastics manufacture, and used as a drug delivery system for some pharmaceuticals. Earlier studies noted the effects of TSN and of toxic byproducts produced in the manufacture of TSN on adult fishes. My specific developmental interest focused on gonad development with an emphasis on the comparison of gametogenesis in male and female embryos in the early (pre-gonadal differentiation) and late (post-gonadal differentiation) stages of development nurtured within gravid females exposed to TSN throughout gestation.

The Scene of Our Girlhood Dreams

Leah C. Mayo

G. Terry Barr, Ph.D.

Department of English

This collection of creative nonfiction essays is an exploration of my camp experiences at an all-girls' summer camp in the mountains of North Carolina. The essays are unified by an overall theme of coming of age for myself and my close friends, as we transition from campers to counselors. It explores themes of gender, authority, friendship, love, and loss, as they appear in the unique environment of an almost entirely female population in an isolated setting. This collection also attempts to unravel camp culture and traditions through an examination of key camp concepts such as folklore, pranking, secret societies, initiation rituals, sexual awakenings, and sisterhood. Overall, the goal of the collection is to develop understanding through writing and discussion.

The Columbian Exchange: A New Tasteful Cuisine

LaQua D. Mayes

Anita O. Gustafson, Ph.D.

Department of History

The Columbian Exchange was a monumental development that took place in early colonial history. Christopher Columbus, for whom the Columbian Exchange is named, was not aware of this territory known as the New World. This finding was an accident, a mere coincidence. The Columbian Food Exchange provided more of an impact than just the introduction of new foods. The Columbian Food Exchange formed a relationship between the Old World and New World that, in turn, influenced and assisted in the progress and prosperity, as well as the detriment of the two worlds.

Using Artificial Neural Networks to Rate Disease Severity in Maize Infected with Artificial Neural Networks to Rate Disease Severity in *Acidovorax avenae* subspecies *avenae*

Joshua K. McCormick

Stuart G. Gordon, Ph.D.

Department of Biology

Maize, rice, and wheat account for 30 percent of the total calories ingested by 4.5 billion people, worldwide (Maize Annual Report 2013). Currently maize is the main food product consumed by over 900 million people living on less than \$2 per day in developing countries. Bacterial leaf blight (BLB) of maize is an emerging disease, caused by the phyto bacterium *Acidovorax avenae* subsp. *Avenae*, that affects rice, oats, millet, sugarcane, and maize. BLB leads to a decrease in photosynthesis as leaf tissue dies off, and as a result, plant productivity (yield) also decreases. This study aims to develop an artificial neural network, a family of statistical algorithms, used to estimate approximate functions that can depend on a large number of inputs and are generally unknown, to recognize BLB symptoms in maize. The artificial neural network could later be adapted to recognize BLB and other disease outbreaks before they occur, potentially using satellite imaging.

Effects of Water and Nutrients on Maize Phyllosphere Microbiome Composition

Miranda K. McCoy

Stuart G. Gordon, Ph.D.

Department of Biology

Maize plants were grown in conditions of 1) low water, 2) low nutrients, and 3) adequate water and nutrients in the green house. Four weeks after planting, microbial samples were taken by pressing saline-dipped filter paper along the fifth leaf of each plant using sterile tongue depressors. Samples were taken twice each for: T=0, week 1, week 2, and week 3 after the start of treatments. The first samples were cultured on rich media, minimal media, and corn extract agar. DNA was extracted from samples and used for real time polymerase chain reactions to quantify the bacteria based on small subunit ribosomal sequences.

Attaching Gold Nanoparticles to Silica Substrates Through Organosilane Linkers

Paul J. McGannon

Latha A. Gearheart, Ph.D.

Department of Chemistry

This research focuses on developing routine methods for covalently attaching gold nanoparticles to silica substrates through organosilane linkers producing stable, well-defined, reproducible surface morphology. Silica substrates readily react with organosilane molecules, forming a covalently bound “linker-molecule” on the silica surface. The organosilane compounds used in this research contained either a thiol or ammine group on the “floppy” end, which forms a strong bond to gold, thus linking the gold nanoparticles to the silica substrate. Surface coverage and morphology were adjusted by varying the concentrations of linker and nanoparticle solutions as well as incubation time. Both the gold nanoparticle solutions and substrates were characterized using electronic spectroscopy, atomic force microscopy, transmission electron microscopy, and Raman spectroscopy. This research has tremendous potential in fields of biomedical, environmental, and industrial catalysis as well as chemical sensor technology.

The Media and Political Participation

Jill N. McLean

Robert H. Freymeyer, Ph.D.

Department of Sociology

The media, through multiple sources, are constantly providing citizens with information on current events and politics. Not only do the media inform, they also may affect the way people think and act. My research is focused on how media exposure affects political participation. More specifically, I am focusing on media exposure in the forms of newspapers, Internet, and television. For my research, I will be using data from the 2012 General Social Survey. I anticipate finding a positive correlation between media exposure and voting: as exposure to media increases so does the likelihood of political participation.

La Virgen de Guadalupe y Sor Juana Inés de la Cruz: dos figuras de la transculturación en la América hispana colonial
(The Virgin of Guadalupe and Sor Juana Ines de la Cruz: Two female figures who contributed to transculturation in Latin America)

Rachel E. Miles

Clinia M. Saffi, Ph.D.

Department of Modern Foreign Languages

In my project, I examine the way in which Sor Juana Inés de la Cruz and the Virgin of Guadalupe influenced the development of the creole consciousness and contributed to the development of the Mexican identity through syncretism: the combination of different cultures. The Virgin of Guadalupe demonstrates religious syncretism, while Sor Juana represents cultural and literary syncretism. These seventeenth century influential females helped set the stage for Mexican independence a century later.

dFOXO Overexpression Can Ameliorate Age-Related Degeneration of Heart Performance in *Drosophila*

A Longitudinal Study of Self-Concept in CHAMPS Students

Jonathan T. Mitchell

Brooke C. Spatta, Ph.D.

Department of Psychology

The goal of this project was to assess change over time in the self-concepts of the students in the CHAMPS program. Longitudinal data collected from 86 CHAMPS students across two consecutive summers was analyzed and results showed that of the nine self-concepts assessed, all but one (social acceptance) improved over time, and statistically significant increases were seen in job competence, romantic appeal, and global self-worth from time one to time two. The findings from this project provide promising preliminary evidence of the positive impact that the CHAMPS program is having on its students.

Granular Physics Simulations

Ignacio Monchetti

Eli T. Owens, Ph.D.

Department of Physics

The beauty of granular materials is that they are all around us, from the common sand on the beach to giant avalanches. A granular material is a collection of discrete, macroscopic particles that interact through strictly repulsive forces. Granular materials have non-linear, complex behavior, which is distinct from that of solids, liquids, and gases. We study how granular materials flow into containers and how the particles interact with boundary walls and one another. Towards this end, we perform classical molecular dynamics simulations in LAMMPS with analysis performed in Python.

MTM Hybrid Course Improves Student Self-efficacy in Performing Medication Therapy Management Services (MTMS)

Mallory L. Moore and **Tara-Dawn R. Tootle**

Sara A. Wagner, Pharm.D.

Department of Pharmacy Practice

The objective of their research is to determine if an integrated approach between a Medication Therapy Management elective course and an Introductory Pharmacy Practice Experience (IPPE) would improve a student's self-efficacy in providing MTM services (MTMS). An elective course was structured so that students were initially trained through the APhA certificate program Delivering Medication Therapy Management Services. These students were then enrolled in an MTMS focused, 6-week IPPE under the supervision of a preceptor who had also completed the same certificate training program. A self-efficacy survey adapted by Dahl and Hall was administered to pharmacy students in their third professional year to determine their confidence levels before and after the hybrid course. A control group of third-year pharmacy students, who participated in the same certificate program but did not have an IPPE specifically focused on MTMS, also completed the survey. Of the 26 students targeted to complete the post-survey, 21 responded (80 percent response). For analytical purposes, the self efficacy survey was divided into five specific categories: billing, communication, documentation, barriers, and clinical knowledge and skills. The hybrid course improved the self-efficacy of our students in the areas of communication, and documentation.

Politics of the Veil in Turkey

Meredith O. Morgan

Roy B. Campbell, Ph.D.

Department of History

In 2010, the lifting of the 1981 ban on head scarves in Turkey was a step meant to increase women's freedoms. However, it set in motion a series of events that now limit women's rights and threaten the future freedoms of Turkish women.

Nanotechnology: A Novel Cell-Directed Gene Therapy to Reduce Inflammation

Cristina U. Moron

E. Alfonso Romero-Sandoval, Ph.D.

Department of Pharmaceutical and Administrative Sciences

Up to 50 percent of patients who undergo major surgeries, such as mastectomies, develop chronic postoperative pain. This indicates that the extent and duration of inflammation are involved in the development of chronic post-surgical pain. We propose to develop a cell-directed gene therapy using nanotechnology to promote a more rapid and efficient wound healing. This would reduce the risk to develop chronic pain following major surgeries. We found that the overexpression of the gene CD163 transfected with nanoparticles into human cells (macrophages) promoted a decrease in inflammation. We plan to confirm whether our approach facilitates a rapid wound healing.

dFOXO Overexpression Can Ameliorate Age-Related Degeneration of Heart Performance in *Drosophila*

Billy Joe Mullinax

Latha A. Gearheart, Ph.D.

Department of Chemistry

Despite increased life expectancy, a decrease in healthy heart function with age persists, manifesting itself as decreased heart rate and fractional shortening, and increased arrhythmias and diastolic intervals. Senescent-dependent changes in these indices are conserved from humans to flies and are possibly related to a decreased ability for autophagy and/or the ubiquitin-proteosomal protein quality control systems to maintain normal protein homeostasis, leading to increased proteotoxicity. Comparisons of cardiac function were made between young and old FOXO overexpressing and control flies using video microscopy and semi-automatic optical heart analysis. SOHA data suggest that age-dependent changes of the conserved indices of heart function in old FOXO flies were significantly ameliorated relative to controls. Moreover, old control flies displayed higher ubiquitin levels. No substantial difference in lysosomes, and thus autophagy, were observed between control and FOXO flies.

Brazilian Flora of Santa Catarina from the Upper Carboniferous Early Permian Time Period

Billy Joe Mullinax

Michael O. Rischbieter, Ph.D.

Department of Biology

The outcrop discovered within the Santa Catarina state by Dr. Michael Rischbieter marks a unique area between Paraná State and the Rio Grande do Sul state. While observing the megafossils, we discovered insect predation on *Sphenophyllum*, which is new for this type of plant. We discovered that our samples contained pollen and spores that could be used in palynological analysis. Of these there were some that were likely from modern day contamination, while others, *Lunbladispora cf. L. riobonitensis*, suggest that this outcrop came from a coal-bearing section of the Rio Bonito Formation, which correlates with previous discoveries. Specifically, it appears that this outcrop was located in the Sideropolis Member, possibly the Barro Branco coal seam. Finally, from the outcrop formation itself we can extrapolate that the environment may have been subjected to subaqueous diagenesis, while the remainder of the outcrop appears to be homogeneous and mixed. With these data we have discovered a significant find for paleobotany in Brazil.

Impacts Regarding Family Structure and Function Changes

Lesley A. Nelson

Robert H. Freymeyer, Ph.D.

Department of Sociology

The family has undergone considerable changes in structure and function in recent years: more children are now raised in a single-parent family. This research focuses on the effects a person's upbringing and family structure has on one's social placement. The family provides resources and opportunities that vary according to the family's structure. Using the 2012 General Social Survey, I expect to find individuals brought up in single-parent families to have lower education, work lower wage jobs, and have less marital success. These findings will contribute to a better understanding about the influential impacts changing the nature of family in the United States.

The Psychology of Politics: Dynamics of Ideological Self-Identification

Laura A. Nix

Erin S. McAdams, Ph.D.

Department of Political Science

The purpose of this Summer Fellows research study was to objectively evaluate the political attitudes of Presbyterian College undergraduate students by assessing participants' self-identified political ideology (liberal, moderate, or conservative), and relating it to their stances on various public policies. An online survey which measured these two variables was sent via email to all currently-enrolled PC undergraduate students to examine whether a theoretical gap exists between political ideology and policy stances (i.e., a participant may self-identify as conservative but then unknowingly express liberal attitudes).

Dynamics of Political Attitudes

Laura A. Nix

Jay L. Michaels, Ph.D.

Department of Psychology

Research examining the role of psychology in political thought has been very influential in explaining how and why people think about politics the way they do. The political thoughts and attitudes of conservatives, moderates, and liberals vary greatly over the political ideological spectrum and have demonstrated compelling psychological differences. The goal of this research study was to objectively evaluate political attitudes by assessing participants' self-evaluations of their own political thought. Findings from this study maintain the idea that conservatives tend to be resistant to social change, whereas liberals tend to be more open and accepting of social change.

Upregulation of Cancer Genes in Breast Tumors with FGD1 Expression

Lynne J. O'Donoghue

Christopher L. Farrell, Ph.D.

Department of Pharmaceutical and Administrative Sciences

Breast cancer is one of the deadliest cancers among women in the United States with an estimated 40,000 deaths each year. The majority of the deaths occur when the tumor cells metastasize to vital organs in the body. Our laboratory is focused on determining the alterations of FGD1 in tumors that are high risk for metastasis. The FGD1 gene encodes for a guanine exchange factor protein which signals cellular migration through the activation of the Cdc42. The Cdc42 is a key molecular switch that regulates cytoskeleton restructuring, cellular morphology, extension, and cell adhesion. Overexpression of the Fgd1 protein has been observed in infiltrating and poorly differentiated breast tumors. To evaluate the importance of FGD1 in breast cancer cells, a RNA microarray was used to determine the change in FGD1 expression. Following the knockdown with the shRNAs in a breast cancer cell line that constitutively expresses FGD1, MDA-MB-231, the FGD1 knockdown and control cells were compared for differences in expression. From the microarray data, potential genes, HRK and the HRASLS2, were altered in the FGD1 knockdown cells. The results suggest that the overexpression of the Fgd1 in breast tumors may be associated with the invasiveness of breast tumors.

Knee Reconstruction

Taylor N. Patti

James T. Wetzel, Ph.D.

Department of Biology

This independent research project was carried out in order to understand the reconstruction process in the human knee after an injury. In order to gain insight on different injuries, a sheep knee was dissected and mock injuries were made, including a torn anterior cruciate ligament (ACL), medial collateral ligament (MCL), patellar tendon, and meniscus.

Research was then carried out to acquire knowledge about the healing process of these injuries. Clay models as well as MRIs and X-rays were used in order to obtain an understanding of the anatomy of the knee. Also, sketches were drawn of various perspectives of the human knee.

The Funding and Objectives of Terrorist Activity

Abigail E. Pearman

Justin E. Lance, Ph.D.

Department of Political Science

With the threat of transnational terrorism ever-present in today's society, the research seeks to understand the connection between terrorism finance, organizational goals, and terrorist activity. The research uses qualitative analysis, due to the rarity of events being studied, to investigate the structure, objectives, and funding of three Islamic terrorist organizations in Africa. The research hypothesizes that as foreign terrorist organizations with localized goals secure funding, terrorist activity will increase, and the data supports a connection between organizational objectives, the ability to finance operations, and terrorist attacks.

The Invisible World: One Nature Observed Through Different Eyes

Anessa M. Pettis and **Lal K. Tan**

James T. Wetzel, Ph.D.

Department of Biology

Our project was designed to compare and contrast the effects of differing cultural backgrounds on imaging techniques on the environment. We took photographs of the same objects in the environment, but in positions suitable to our individual desire. Then we edited our images to bring out specific themes and emotions that we individually wanted to convey through our photography. We worked with the following themes: patterns and shapes, it's a small world, find a niche and fill it, life in the shadows, nature will find a way, the tracks of man, reclaimed by nature, the invisible world, and wabi sabi. Based on our different cultural backgrounds, we conveyed different emotions through our imaging techniques. It was also found that one of us desired to take pictures and edit them in a way that it would be hard to distinguish what the objects were originally, while the other desired a more direct, obvious image in an abstract design. The desire to create an image that was difficult to distinguish what the original object was, appeared to be part of that person's cultural art in Burma. The desire for abstract art seemed to arise from art around the house and the culture presented in American schools.

Development of a Siderophore-Conjugated Pantothenamide Antimicrobial Drug

Jaron L. Pettis and **Jeremy D. Mitchum**

Walter R. Ott, Ph.D.

Department of Chemistry

The primary objective is to formulate and create an antibiotic based on a N-alkylpantothenamide attached to a siderophore for absorption by bacteria on wounds. N-alkylpantothenamides are novel, high-affinity inhibitors affecting fatty acid and coenzyme A (CoA) biosynthesis. Siderophores are utilized by bacteria to collect iron in the environment around them. When bacteria have invaded a host, iron sources are low, therefore siderophore production and utility is high. Attaching the antibiotic to this siderophore will potentially allow the drug to act as a “Trojan Horse,” as it is referred to in drug- development literature, and the bacteria will absorb it with little resistance.

A Legend of the New Frontier: The Transformed Figure of the American Hero in Douglas Fairbanks' Silent Films

Paul B. Rice

H. Dean Thompson, Jr., Ph.D.

Department of English

Douglas Fairbanks is often internationally remembered as a swashbuckling silent film actor who accomplished amazing stunts and delivered the first film performances of characters such as Robin Hood and Zorro. However, the real story doesn't end at that. Fairbanks engages in an archetypal and formative relationship with the American frontier in his films. In fact, Fairbanks' appropriation of Old World stories and his exploration of masculinity and urbanization issues prefigure a new type of American heroic figure - one that laid the foundation for countless other American popular figures in the twentieth century.

Impact of Race and Gender on Education

Demarcus A. Rouse

Robert H. Freymeyer, Ph.D.

Department of Sociology

Race and gender continue to play major roles in the United States.

This research considers the impact of race and gender on education.

I hypothesize that whites achieve higher levels of education than non-whites, and males achieve higher levels of education than females.

Analysis of data from the 2012 General Social Survey finds support for my hypotheses: white males have the highest levels of education in spite of recent societal changes.

Granular Flow into Model Silos

James E. Satterfield

Eli T. Owens, Ph.D.

Department of Physics

It has long been observed that the pressure at the bottom of a granular container, for instance a grain silo, saturates as the height of the container increases relative to its width. However, the precise effect grain shape has on the buildup of sidewall pressure is not well understood. Using a model silo and filling it with corn or peas, we investigated the influence of grain shape on sidewall pressure during the filling process. We see that since the peas are spherical, they can more easily rearrange than the irregular corn particles and that the peas are not as effective at screening the pressure.

The Party That Led To A War: How the British Response to the Boston Tea Party Caused the American Revolution

Stephen N. Scaife

Anita O. Gustafson, Ph.D.

Department of History

The American Revolution was one of the most significant events in history, yet its direct cause and the source of its strength are widely misconstrued. Many believe the Revolution began as a result of the Boston Tea Party. Although it was a crucial event in the commencement of the American Revolution, the Tea Party, contrary to many opinions, was not the cause of unity among the colonies. Rather, it was Britain's response to the Boston Tea Party—the Intolerable Acts—that ultimately produced the war. Parliament's enactment of the Intolerable Acts, and Parliament and King George's refusal to repeal the acts, directly united the colonies and impelled them to rebel against Britain, thus causing the American Revolution.

Brecht, Boal, and Beyond: An Interactive Presentation

MaryBeth C. Schaffner

Lesley J. Preston, M.F.A.

Department of Art, Theatre, and Dance

In this presentation, I will provide an outline of the shift of political theatre from propaganda styles to more democratic narratives. I will begin by providing a brief history of the connection between theatre and democracy in the United States, particularly emphasizing the development of a mediating voice in Living Newspapers under the Federal Theatre Project (FTP) during the great depression. Following this exploration, I will provide a short analysis of the theatrical style of Augusto Boal, a Brazilian practitioner who was influenced by the FTP's Living Newspapers. Boal called for a highly participatory theatre in which a mediator, called a joker, facilitates interactions between actors and audience members. Finally, I will provide a short reading of my play entitled "Our Lances: Are But Straws" and invite the audience to participate in a short workshop using Boal's games and techniques.

Brain Science, Statistical Physics, and English: Assessing the Language of Complexity

Rachael Fu-Min Sealover

James A. Wanliss, Ph.D.

Department of Physics

We are doing research at the interface of neurophysics and language. How does language structure teach us about brain function? We employ modern physics ideas to explore language behavior. The canonical partition function in statistical physics can describe English letter and word orderings. Words consist of sequences with structures of fractal nature. We will utilize statistical physics concepts indicating relative complexity of language processes. The methods developed are attractive for analysis of complexity found in word populations. Our methodology accesses complexity of different kinds of books (i.e. flight-operation manuals, textbooks, etc.) and ranks them.

Tree Characteristics that Affect the Distribution of Mistletoe on Presbyterian College's Campus

Katlyn E. Sepsey

Suann Yang, Ph.D.

Department of Biology

The hemi-parasitic plant mistletoe is ecologically valuable because of its role in biodiversity and mutualism with key bird dispersers. Mistletoe is detrimental to many species of trees, with effects ranging from reduced growth to mortality. Urban trees are typically large and manicured. These characteristics are preferred by mistletoe. My objective was to determine what factors affect the spatial distribution of mistletoe on Presbyterian College's campus. I found that infected trees on Presbyterian College's campus are spatially aggregated. Understanding the spatial distribution of mistletoe and on its hosts can help predict mistletoe spread and success in urban environments.

The Separation of Religion and Democracy

Lovey M. Sheppard

Anita O. Gustafson, Ph.D.

Department of History

The United States was founded as a nation of religious freedom, tolerance, and opportunity by the Founders, who were heavily influenced by the radical ideas of the Enlightenment and their own religious convictions. The Founders had the foresight to realize that while America may have been a nation full of Christians, it could not be a nation with an established religion. The impact of the Enlightenment and the specific religious views of certain Founders have been interpreted over time and show the emphasis on religious tolerance. By looking at historical background, historiography, and numerous sources a deeper understanding of the Founders' foresight and intentions can be achieved.

Causes of the Yamasee War and Relations Between the Native Americans Following the Conflict

Aubrey B. Smith

Anita O. Gustafson, Ph.D.

Department of History

Viewed as the conflict that nearly destroyed a whole colony, the Yamasee War took place throughout the Colony of South Carolina from 1715 to 1717. Involving many Native American tribes throughout the Southeastern region of North America, the conflict created a great fear among the many settlers who inhabited the region. Looking at how the two races coexisted and focusing on events that occurred predating the war, opinions can be shaped for the question of why the war began. Through their gained reliance on trade with colonists, restrictions on the Native Americans began to grow, leading to strained relations and eventually war.

Diminishing Differences: The Impact of Gender on Judicial Behavior in Family Court Decisions

Madison A. Smith

Erin S. McAdams, Ph.D.

Department of Political Science

This paper examines the possible correlation between the gender of South Carolina family court judges and their appellate decisions in family court cases. The data was collected from more than 300 appellate decisions in family court cases, which were decided by the South Carolina Supreme Court and Court of Appeals and published on the South Carolina Judicial Department website. The cases were examined to determine whether the outcomes were favorable towards the male or female involved in the family dispute and compared to the gender of the judge, which was obtained through various online sources. The results of this study show that there is not a correlation between these two variables, indicating that the gender of a judge may not impact his or her decision-making, affirming the equity of the state's justice system.

Advantages and Disadvantages of the Use of Cipher Notational Systems in Selected Asian Musical Traditions

Tianna M. Smith

Karen W. Buckland, Ph.D.

Department of Music

This research project examines several types of world music notational systems, including the Javanese Kapatihan system for karawitan, the Hindustani sagram and Carnatic swara systems for Indian classical music, and the gongche and jianpu systems of Chinese classical music. The background of each musical tradition, including history, musical elements, and tuning systems will be addressed in order to understand why the traditions use cipher notation systems. Following the description of each system, the advantages and disadvantages of each notational system will be analyzed in further detail, demonstrating that musical notation can be both beneficial and damaging toward these musical traditions.

Adaptation Over Survival: South Carolinian Leaders' Contributions

William H. Sohm

Anita O. Gustafson, Ph.D.

Department of History

Names like Francis Marion and Thomas Sumter are remembered for their part in South Carolina's guerilla campaigns. However, South Carolina saw a lot more large-scale action than it is typically given credit for. The leaders who commanded in these larger battles like Daniel Morgan and William Campbell are often left out of South Carolina's popular history. Given this, I thought that these military leaders and the major battles deserved a closer look to see if they warrant more praise. Military leaders in South Carolina who fought larger scale battles were able to adapt their tactics and play a bigger role than previously given credit for in the Southern Campaign.

The Old Northwest Revival: Native Americans and the Struggle for Independence in the Northwest Indian War

Jeffrey D. Strickland

Anita O. Gustafson, Ph.D.

Department of History

In 1783, the United Kingdom ceded the land that became the Northwest Territory to the United States of America as part of the treaty that ended the Revolutionary War. From 1785 to 1795, the territory saw a conflict between the Americans, the British, and the Native Americans living there, over control of the territory that was later titled the Northwest Indian War. The Americans saw the Indians as obstacles that needed to be exterminated or removed, and the British saw the Indians as potential pawns in their struggle to retain control of the Northwest Territory. The Indians, however, used both the Americans and the British to maintain their independence. This paper argues that Native Americans possessed agency and were actors in maintaining independence through creating an alliance with the British, conducting warfare on their own terms, and creating an Indian confederacy between several different tribes.

Isolation and Characterization of the Glycated HDL subfraction in Type 2 Diabetes Patients

Jada A. Suber

Craig Powell, Ph.D.

Department of C

Elevated plasma glucose levels typically found in diabetic patients result in increased amounts of several proteins. We want to determine if a non-glycated subfraction of HDL (N-HDL) and a glycated subfraction of HDL (G-HDL) could be isolated from both the HDL2 and HDL3 lipoprotein subfractions isolated from type II diabetic patients and matched non-diabetic subjects in a manner similar to the glycated and non-glycated subfractions of LDL. We also aim to determine if the concentrations of S1P and ApoM differ in N-HDL and G-HDL isolated from HDL2 and HDL3 obtained from each donor and, additionally, determine the complete sphingolipid profile of each HDL subfraction.

Emerging Telepharmacy Practices: Guidance from the Past and Opportunities for the Future

Alexandria V. Yarborough

Tiffany B. Threatt, Pharm.D.

Department of Pharmacy Practice

In our current world of technological advances some patients still do not have access to adequate healthcare. In order to control disease states, it is imperative that patients not only receive their medications, but are properly counseled and monitored by educated professionals. Pharmacists can not only dispense medications to these patients but can also provide crucial information and encouragement many patients need to adhere to their medications. This review summarizes a comprehensive search of the literature surrounding telepharmacy. Of the 206 articles identified, 113 were included in the review. Key telepharmacy intervention categories included: remote checking, by telephone, online patient portals, digital retinal assessment, videoconferencing, text messages, smartphone applications, and web-based care and education. Telepharmacy can serve as an efficient and effective component of patient care, and meet the needs of those that cannot easily access care otherwise.

The Effect of Drought Conditions on Complex Information Exchange in Soil Medium of *Phaseolus lunatus*

Cassandra M. Walker

Michael O. Rischbieter, Ph.D.

Department of Biology

Plants experience abiotic and biotic stressors that can potentially compromise their survival. Plants use a variety of defense mechanisms in order to prevent critical damage by either biotic agents, such as herbivores or parasitic symbionts, or abiotic agents, such as soil moisture and mineral content. There are a large variety of chemicals that plants use through different media in order to communicate to other plants as a defensive strategy. This research found that below-ground informative exchange, measured by stomatal aperture size, does not occur between Lima bean plants (*Phaseolus lunatus*) that are subjected to a drought environment.

Social Class Influences Parenting Style

Emory E. Ward

Robert H. Freymeyer, Ph.D.

Department of Sociology

Parenting styles, an important determinant of how a child will be raised and will behave, vary from family to family. Social class particularly influences why parents use a certain parenting style. Parents of higher social class are more likely to use an authoritative parenting style, reasoning with their children; while parents of lower social class are more likely to use an authoritarian parenting style, heavily restricting their children. Using data from the 2012 General Social Survey, I find that the level of social class does influence the choice of parenting style: Parents of higher social class teach their children the importance of thinking for themselves, while parents of lower social class teach their children the importance of obeying their parents.

Inflammatory Leadership: The Sons of Liberty Prior to the American Revolution

Allston T. Warren

Anita O. Gustafson, Ph.D.

Department of History

Great men undertake great challenges which in turn produce great rewards. The birth of the United States of America was one such reward. The formation of the United States was never a guaranteed occurrence, and numerous obstacles to independence made the political leap from a European colony to a sovereign nation a gargantuan task which had formerly been inconceivable. Through a combination of superior military might, classical political ideals, vastly superior logistical and economic infrastructure, and a divided populace, the prospect of an independent nation seemed daunting at best. The American cause needed great men and great leadership to rise to the occasion. The Sons of Liberty stood tall amongst the colonial American populace and demanded their rights as free men. Through their actions and coordination, they set the example for all of the American colonists on how to resist the British Empire.

Synthesis of Biocompatible Gold Nanorods

Maria E. Whitaker

Latha A. Gearheart, Ph.D.

Department of Chemistry

The field of nanotechnology has grown exponentially over the past decade with new discoveries and applications emerging regularly. Within this general field of nanotechnology, gold nanoparticles have received significant attention due to their unique size and shape-dependent optical properties which have lead to diverse applications in biomedical imaging, catalysis, and chemical sensing technology. Many intricate nanoparticle shapes have been synthesized, which include spheres, triangles, stars, cages, and rods. Each morphology interacts with visible light differently, thus providing new, unexplored avenues for application. Gold nanorods, in particular, have shown great potential in the biological and biomedical fields; however, their synthesis often requires the use of cytotoxic stabilizer to maintain the desired rod-shape. Hence, it is important these nanorods be modified for greater biocompatibility. In this research, gold nanorods were synthesized in the presence of a toxic, surfactant shape-stabilizer then modified to replace the surfactant with amino acids, potentially making them more biologically friendly.

Impact of Race and Gender on Socioeconomic Status

Donelle L. Williams

Robert H. Freymeyer, Ph.D.

Department of Sociology

The United States has made progress towards greater equality, as exemplified by the election of the first African-American president. Inequality, however, remains a major issue in American society. I use data from the 2012 General Social Survey to consider the impact of race on socioeconomic status and further consider whether this relationship differs between females and males. I expect to find that non-whites have lower socioeconomic status than whites, and the relationship is weaker for women than men. My results will provide further evidence that inequality remains an issue that needs to be addressed in American society.

Barriers

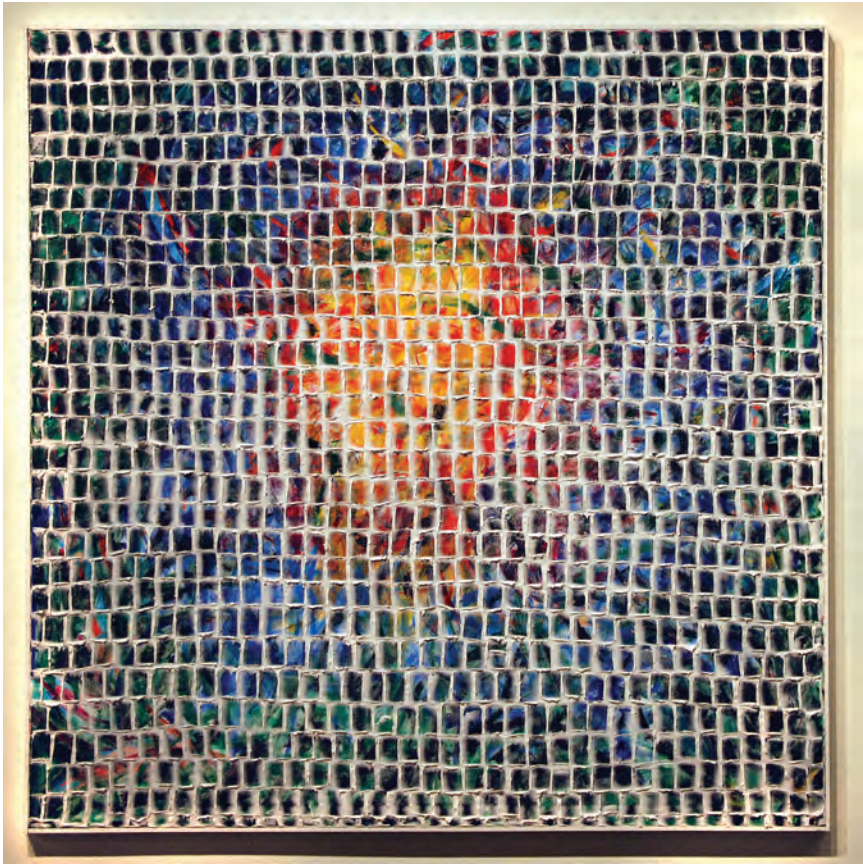
Erin Connolly

Mark R. Anderson, M.F.A.

Department of Art, Theatre and Dance

Illness, poverty, loneliness, abuse, or even a flat tire can be barriers that make people feel caged. Barriers are common obstacles in everyday life whether they are emotional, physical, or psychological. Barriers in some form impact everyone; though many do not realize they are subject to barriers or simply do not want to admit it. Growing up as a lively, energetic child, color and texture always captured my attention. I still enjoy being able to touch a surface and feel several different textures beneath my hands. The famous works of Picasso and Kandinsky mesmerize me. I am influenced by other artists such as Dan Lafferty, Susanna Shap, Katie Tooth, Erin Loree, and Taylor Winn. I improvise or take a synthetic approach with each piece. I start by layering strokes of paint, taking in the emotion that it shows and then responding to it. I often navigate towards the opposite of my original attempt, whether it is color or method of approach. This method allows me to create barriers within my work as I apply medium on top of medium. Being able to create a three-dimensional element to a formerly flat surface is intriguing, and alluring. I feel that paint, as a medium, allows me to reach a deeper concept within the piece. It gives me the freedom and ability to create several layers giving it a sense of space.





Department of Music Honor Recital Students

Seth Matthew Brown, *double bass*

Lindsey Elizabeth Gardner, *soprano*

Joshua Richard Harrington, *organ*

Cassidy Michaelle Jarrett, *percussion*

Gabriela J. Lewis, *violincello*

Tianna Marin Smith, *soprano*

Hannah Marie Taylor, *soprano*