

Honors Day Symposium

Presbyterian College

April 18, 2013

1 Titles, Authors, Advisors, and Abstracts

1.1 The Construction of the Heroine in the Novels of Jane Austen

Grace M. Aldridge

Advisor: Lynne M. Simpson, Ph.D.

Department of English

In contemporary times, the heroine, still as popular as ever, has necessarily changed, or evolved, from what she used to be. Jane Austen's nineteenth century heroines certainly did not face the same issues as the contemporary heroine (think Bridget Jones and her struggle to balance romance and career), but they endure, and indeed are more popular than ever. The quality that Austen considered crucial to her heroines was "bloom," a word which means the "most flourishing condition or season, prime, perfection." Anne Elliot, Fanny Price, and Catherine Morland are three of Austen's most blooming heroines, and they represent Austen's unique construction of the literary heroine.

1.2 Mother Dearest to Mother Monstrous: The Intersection Between Motherhood, Region, and Monstrosity in Southern Women's Writing

Grace M. Aldridge

Advisor: Margaret T. McGehee, Ph.D.

Department of English

This thesis explores the intersection between motherhood, region, and monstrosity in Southern women's writing. The U.S. South has a long history of intensified gender designations and expectations. The pressure of motherhood itself combined with the intensity of social expectations for Southern mothers often has disastrous results: they become monsters – or at least they are perceived as monsters. Feminist theory and monster theory are used in relation to three primary texts, each a work of Southern women's writing, to support the argument that the monstrous mother is constructed culturally, not biologically, and is a reflection of the fears and anxieties of the culture that engenders her.

1.3 The Importance of Naming in “The Poisonwood Bible”

Mirhanda H. Alewine
Advisor: Lynne M. Simpson, Ph.D.
Department of English

The Poisonwood Bible details the journey of a Southern Baptist missionary family in the African Congo, and Barbara Kingsolver primarily tells this family’s story through the perspectives of its four daughters, all of whom are vastly different from each other. In the African Congo, words in Kikongo may have several meanings depending upon pronunciation, a fact that produces both ironic and comic miscommunication between the Americans abroad and the native Congolese. In Kingsolver’s *bildungsroman* each of the Price daughters ultimately grows to embody the Hebraic meaning of her name, underscoring Kingsolver’s attention to linguistic detail.

1.4 Do Water Fleas Feel Cold? Evidence for TRPM8 Expression in *Daphnia Magna*

Ronnie M. Anderson
Advisor: Sarah M. Sweitzer, Pharm.D.
Department of Pharmaceutical Sciences

The menthol or cold receptor belongs to the transient receptor potential cation channel subfamily M (TRPM). The intent of this study was to determine if *Daphnia magna* have functional menthol (TRPM8) receptors, using a behavioral analysis. *Daphnia* were exposed to different concentrations of menthol for one minute and then transferred to an activity chamber. From these studies, *Daphnia* activity was lower ($p < 0.05$) in those exposed to the menthol as compared to vehicle control. A size-dependent change in activity after menthol exposure was also observed. As the size of the *Daphnia* decreased, so did their level of activity upon exposure to menthol. These findings suggest that *Daphnia* may possess functional menthol (TRPM8) receptors but that the behavioral response pattern is age (size)-dependent. We propose that this model may provide a rapid high throughput assay for identification of TRPM8 agonists and antagonists.

1.5 Chivalry in Aviation during World War I and World War II

Yates H. Atkinson
Advisor: Stefan W. Wiecki, Ph.D.
Department of History

German fighter pilots in World War I claimed to be the knights of the sky and regarded their battles with French and British pilots similar to a sports competition and not all out war. This research examines whether German pilots actually adhered to the code of chivalry and whether or not that ethos continued into and through World War II.

1.6 Education Level’s Influence on Spanking

Anderico R. Bailey
Advisor: Robert H. Freymeyer, Ph.D.
Department of Sociology

Spanking has long been a controversial issue in American society. This research uses the 2010 General Social Survey (GSS) to examine the relationship between education and spanking. I hypothesize that people with less education are more in favor of spanking and expect to find respondents with lower education will strongly agree on spanking while people with higher education will disagree. Racial differences are also investigated.

1.7 The Role of the Sweating Sickness in Tudor England

Gordon M. Ball
Advisor: Richard R. Heiser, Ph.D.
Department of History

This research focuses on the impact of the sweating sickness, or English Sweat, in the context of Tudor England and the medical understanding present in the period as a whole. This will include demographic analysis with respect to the disease, the history and contributions of different physicians across the time period, the reactions of government and society to disease, and other significant aspects of Tudor culture and politics as they relate to medical history.

1.8 The Economy of Germany

Laura L. Blanco
Advisor: Jody W. Lipford, Ph.D.
Department of Economics and Business Administration

The Euro Crisis brought the world's attention to Europe. While the majority of the countries of the European Union were on or past the verge of economic collapse, one country stood firm. This research examines why Germany was able to stand her ground and become the economic power she is now. Analysis includes the reforms passed by the Bundestag, Germany's parliament, leading to the determination that Germany was proactive in her austerity measures long before the crisis hit. Further research addresses a detailed analysis of Agenda 2010, and its effects. Data including the RGDP, unemployment and employment figures, long term interest rates and finally the credit default swap prices were investigated. The authors found that Germany's reforms were very effective in their intention. The leadership of Germany was then analyzed. Chancellor Angela Merkel and Finance minister, Wolfgang Schauble, are the key instruments as to why Germany is successful at staying afloat in the midst of this crisis. Their credibility and focus are unique not only in Europe but around the world. Finally we conclude the paper by saying that the leaders of the world community rightfully look to Germany as a hope to a resolution to this almost helpless situation.

1.9 My Artist Statement

Nicholas C. Bozard
Advisors: Mark R. Anderson, M.F.A. and Ralph H. Paquin, Jr., M.F.A.
Department of Art

Art is a way for us to connect to one another. Each piece is a small window we can look through to see a partial reflection of who the artist is and how they got to be there. Our lives are all completely different, comprised of the choices and experiences we've had on our journey through life. While a typical cliché analogy suggests that "everybody is as unique as a snowflake," that doesn't even begin to describe the wonderful uniqueness of each individual person. Rather, think of a massive snowstorm consisting of millions upon billions of unique elements all exclusive to that moment. Each snowflake is a new experience flying by in a mad, chaotic tempest, just barely allowing the slightest impression. But an impression is made all the same. After everything is all said and done, the resulting blanket of pristine snow is so incredibly beautiful that any who might stop and consider the scene are struck dumb with awe. Like the snowstorm, with every single piece placed together in a complex pattern that will never exist again, our lives are the most beautifully intricate pieces of art we could ever create.

I personally had a lot of difficulty seeing the beauty of my own snowstorm, or at least portions of it. For a while, it seemed that if I ignored the rough part of the storm then I would only be left

with the beautiful ending. But how does the good come to exist without the bad? I decided to focus my art on this theme. Doing so, however, was much more difficult than I had anticipated.

About a year ago, I began to journal everything I could remember about my life. I had determined that in order for me to be able to understand the full scope of my existence, I had to go back as far as I could. At first the process was pretty slow, a few memories here and there, since we tend to limit ourselves by suppressing our darkest memories, but soon my memories were literally flooding onto the paper, one after another, building my understanding of who I was. It also brought back a lot of stuff that I had immaturely stashed away in my mind in hopes that they would fix themselves. This was the hardest part as I have always been adverse to dealing with my problems in such a direct manner. I believe I am my experiences and nothing more. From the day I was born I began to be influenced and molded by what I could, at the time, only vaguely comprehend. Now, after twenty-one years of experience, looking back, I can't even begin to fathom the specific combination of twists and turns that were required for me to be where I am right now. Just imagining the statistical improbability of anybody having the life they actually have is so absurd that almost any other outcome would be either as or much more likely to have occurred. So why would we want to ignore any part of our lives? Why would someone purposefully limit themselves so severely?

After a month or two dedicated to recalling memories, the entire concept for my art began to form in my mind. I knew that I wanted each piece to be relatable to my prospective audience, but I also wanted my life to be a sizable portion of my subject. Next I explored different possible methods for transforming my experiences into a format that is understandable on a large scale. I decided that basic emotions were the clearest way to connect to a broad plethora of differing viewers. I began to concentrate heavily on the specific emotions I felt during different moments in my life, which I then translated into an abstract concept presented in the art you see before you.

Each painting is an immensely personal experience and has remained so all throughout the process. This is my reclaiming of my past as mine; never meant to be ignored but neglected nonetheless. Due to the somewhat raw and exposed nature of my subject, I chose to display the human figure as "basic." The traditional human figure holds little to no gravity in my work due to its inability to change drastically and dynamically, I prefer, instead, to create a figure from scratch, using what I've studied in the subject of human anatomy. I alter the structure of the figure by bending and shifting the already existing framework into new and more interesting shapes to reflect the intended emotions.



Gallery Installation, "By Moonlight", "Wait", & "Encased"

Nick Bozard





"Falling Repose"

Nick Bozard



Installation, "Tempus Volat, Hora Fugit", "Soliloquy", & Regret of Shame, and Shame of Regret"
Nick Bozard

1.10 Parenting Style, Internalizing and Externalizing Problems, and Academic Performance in Adolescents

Sarah P. Bumgarner and Drew S. Brandel
Advisor: Brooke C. Spatta, Ph.D.
Department of Psychology

The relationship between parenting style and internalizing and externalizing problems and the relationship between global self-worth (GSW) and academic achievement when taking the importance of scholastic competence into account, were examined in 153 7th through 10th grade students involved in a community academic support program called CHAMPS (Communities Helping, Assisting, and Motivating Promising Students). Significant correlations existed between harassing parenting and total internalizing problems along with overprotective parenting and total internalizing problems, but, contrary to previous research, significant correlations did not exist among any of the parenting styles and total externalizing problems. Furthermore, GSW correlated significantly and positively with scholastic competence and the importance of scholastic competence, and, as was expected, we found GPA was significantly and positively correlated with scholastic competence. However, the correlation between global self-worth and GPA was not significant, and no evidence that the importance of scholastic competence had any moderator or mediator effect was found. This research was conducted with the objective of benefiting CHAMPS through gaining knowledge about the students who take part in the program.

1.11 Links between Parenting Style and Internalizing and Externalizing Problems in Adolescents

Sarah P. Bumgarner
Advisor: Brooke C. Spatta, Ph.D.
Department of Psychology

The links between parenting style and internalizing and externalizing problems in adolescents was examined in 153 academically promising 7th through 10th grade students (96 females, 57 males) involved in the CHAMPS program (Communities Helping Assisting and Motivating Promising Students) a local support program. Measures assessing three different styles of parenting, harassment, fear induction, and overprotectiveness, were collected along with measures of total externalizing and internalizing problems in order to explore correlations among the constructs. It was hypothesized that more abrasive forms of parenting (harassment and fear induction) would be associated with more externalizing and internalizing problems. Significant correlations existed between harassment and total internalizing problems along with overprotectiveness and total internalizing problems. A significant correlation did not exist among any of the parenting styles and total externalizing problems. The goal of this research is to improve the effectiveness of the CHAMPS program by better understanding its students and their relationships with their parents.

1.12 The Changed American Homefront: What Happened to Uncle Sam?

Julia M. Burger
Advisor: Stefan W. Wiecki, Ph.D.
Department of History

While the home front of World War II has a universal rhetoric of sacrifice and unity, the modern home front lacks this, although in both instances America was attacked, inciting its entrance

into the wars. This research examines the reasons why the American home front experienced such dramatic changes between World War II and the War on Terror. While comparing different aspects of both home fronts and the events between the wars, the reasons why the two home fronts differ so greatly are explored.

1.13 Parents' Influence on Their Children's Education

Krishonda D. Burnside
Advisor: Robert H. Freymeyer, Ph.D.
Department of Sociology

Because of the importance of education in contemporary society understanding the factors that influence educational attainment is important. This study examines the influence parents' education has on a child's education. I use data from the 2010 General Social Survey (GSS) to examine this relationship. I hypothesize that children whose parents attain higher education will attain more education. I also control for sex to determine whether mother's or father's education has differing influences on men and women. I expect to find that fathers will have less of an influence on education than mothers, especially for females in the study.

1.14 Fresh Flowers: A Colorful Look at Patterns

Megan E. Carn
Advisors: Mark R. Anderson, M.F.A. and Ralph H. Paquin, Jr., M.F.A.
Department of Art

I find inspiration in almost anything, but particularly nature and fashion. During my 2012 trip to Greece and the Mediterranean, I soaked in all of the beautiful surroundings and photographed everything I could. The poppies and other flowers I saw scattered throughout the country were stunning. Their vibrant colors made a lasting impression on me, so I decided I wanted to incorporate these into my art for this show. My paintings, wallpaper, and fabrics are a mixture of geometric patterns, and loose, expressive flowers, placed together to form a cohesive unit. I have been inspired by modern artists and fashionistas like Kristy Gammill, Lilly Pulitzer, and Ana Tzarev, particularly for their use of color and pattern.

Patterns are sometimes difficult. They can be monotonous or hard to look at from time to time. However, they can also be enjoyable to create, and rewarding when they come to life on a canvas or on fabric. The challenge in working with them lies in the precision, focused thought process, and technical control required to create a repetitive yet successful piece, along with an ever-present desire to insert alterations and personal touches throughout in order to prevent the inevitable digital rigidity inherent to creating patterns on a computer. This challenge informs a process that I find incredibly enjoyable and exciting. Although the work is tedious at times, my personality is reflected in it: organized, thoughtful, and fun.

I use a number of techniques and processes in the creation of my art, depending on the medium I am using. For fabric and wallpaper, I use computer programs to make an image that can be seamlessly repeated or I paint a symmetric image and scan it into the computer. Currently I use Spoonflower, a printing house in North Carolina, to produce the fabrics or wallpapers I need. The paintings are all done in acrylic, sometimes mixed with water, sometimes mixed with iridescent medium, and sometimes not mixed at all. I decide what flower I want to paint and what colors I would like to use, and then I paint the first one in a random spot on the canvas. From there, I paint the next one, and then the next one, until I've either filled up the canvas or created an interesting mixture of positive and negative space. Once everything is dry, I add accents to places that need more color and fill in any background. I always wait a day and come back to look at a painting before I call it "finished."



Upholstered Bench & Poppies Wallpaper

Megan Carn



"Hydrangeas" (1 & 2)

Megan Carn



(Above) "Bouquet"

Megan Carn

"Pansies" (Below)





"Poppies"

Megan Carn



Coral Chevron Aqua Moroccan Trio

Aqua Chevron Coral Moroccan Trio

Megan Carn

1.15 Antipsychotic Rechallenge Following Neuroleptic Malignant Syndrome: Examination of Second Generation Antipsychotics

K. Jennifer Carter

Advisors: Kathryn N. Freeland, Pharm.D.; Jaime A. Foushee, Pharm.D.;
and Nancy H. Goodbar, Pharm.D.

Department of Pharmaceutical Sciences

Neuroleptic Malignant Syndrome (NMS) is a life-threatening reaction that occurs in 0.02%-3% of patients taking antipsychotics. The primary purpose of this study is to evaluate which antipsychotics are used following an episode of NMS in patients taking SGAs and to secondarily identify patient characteristics that may affect treatment choice. This retrospective chart review utilized electronic medical records and a diagnosis of NMS to identify patients admitted between 05/31/2010 and 06/01/2012. Included patients were ≥ 18 years old, taking an SGA and met DSM-IV-TR criteria. Data collection included: laboratory measures, patient demographics, NMS symptoms, time to symptom onset and intervention, length of hospital stay, supportive measures, number of psychotropic medications, time off antipsychotic, and antipsychotic used to rechallenge. Descriptive statistics were used to assess data for trends. All patients had documented risk factors that contribute to poor prognosis. Patients received fluid resuscitation and dantrolene within 5 hours of symptom onset. Patients who were rechallenged were given SGAs with weaker D2 affinity than the initial medication. One patient who failed initial rechallenge and developed recurrent NMS responded well to an SGA of weaker D2 affinity. Patients with poor clinical outcomes were elderly, taking multiple psychotropics, had multiple comorbidities, and displayed more “typical” NMS symptoms. Utilizing SGAs with weaker D2 binding affinity may provide increased tolerability and lower risk of recurrent NMS. In patients with NMS on an SGA, consider previous antipsychotic trials, binding affinity of other SGAs and patient characteristics to prevent recurrent episodes and improve patient safety.

1.16 Shell Shock and PTSD through Movies and Memoirs

Murray E. Corbett

Advisor: Stefan W. Wiecki, Ph.D.

Department of History

This research will explain shell shock during the First World War and the coping methods of the soldiers. Research will include the use of memoirs and diaries, as well as through film. It will also highlight how treatment and coping with war related trauma has evolved over time, concluding with a comparison of modern Post Traumatic Stress Disorder and the ways soldiers cope today.

1.17 Elizabeth I: A Queen, Not a Soldier

S. Montgomery Cornelson

Advisor: Richard R. Heiser, Ph.D.

Department of History

The soldiers of Elizabeth I's military were not overall pleased with their queen's actions and contributions to her men of service. They felt underpaid, unacknowledged, and simply unimportant in the Queen's eyes. They would not express their anger before the Queen because they remained loyal and respectful to her even during the harsh experiences they were involved in. Queen Elizabeth was given admiral respect from her military throughout her reign when she had contributed little to their cause.

1.18 Learned Avoidance in the Male Syrian Hamster

E. Burdette Cullum
Advisor: J. Alicia Askew, Ph.D.
Department of Psychology

The purpose of the experiment was to demonstrate learned avoidance in the Syrian hamster using our modified passive avoidance apparatus (MPA). We also wanted to determine if learned avoidance is affected by defeat context. Eighteen male Syrian hamsters were matched by weight and randomly assigned to one of two groups: Defeat in the MPA fighting arena or defeat in a separate fight arena. Five male Syrian hamsters were used as the dominants. Defeated subjects exhibited learned avoidance only when subjects were defeated in the modified passive avoidance apparatus fight arena. Our results suggest that learned avoidance depends on defeat context.

1.19 Learned Avoidance in the Male Syrian Hamster: Effects of Glucocorticoid Antagonist on Memory Reconsolidation

E. Burdette Cullum, Erik Haugsnes, J. Michael Hanna
Advisor: J. Alicia Askew, Ph.D.
Department of Psychology

There is evidence that glucocorticoid hormones are involved in fear learning. In this experiment we will use our modified passive avoidance apparatus and a glucocorticoid antagonist, mifepristone, to investigate the role of glucocorticoids in the reconsolidation of learned avoidance of defeated male Syrian hamsters. It is hypothesized that mifepristone administration will produce memory deficits when the defeat memory has been reactivated, and that deficit will be observed 48 hours and 1 week after the administration. Prolonged deficits that are dependent upon memory reactivation would suggest that glucocorticoids play a role in reconsolidation of learned avoidance in male Syrian hamsters.

1.20 Our Walls

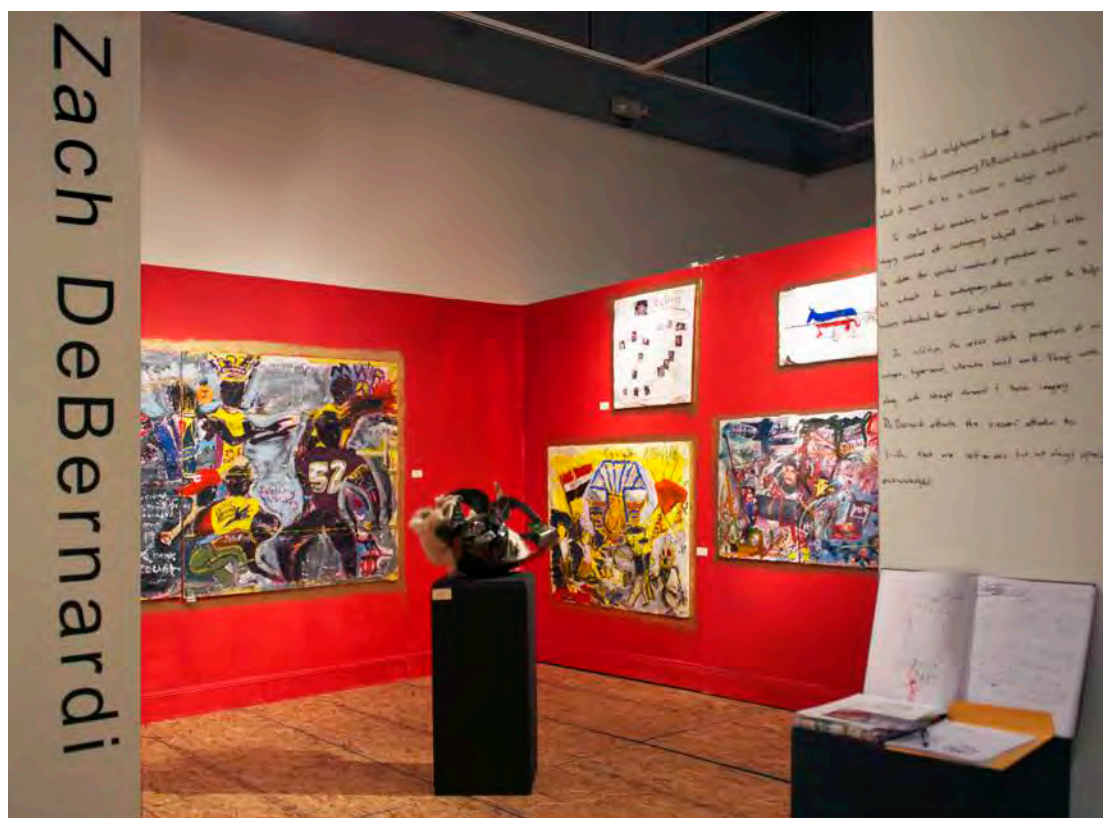
Zachary N. DeBernardi
Advisors: Mark R. Anderson, M.F.A. and Ralph H. Paquin, Jr., M.F.A.
Department of Art

Art is about enlightenment. Through the combination of paleolithic and contemporary references, I am seeking enlightenment on the question of what it means to be human in today's world.

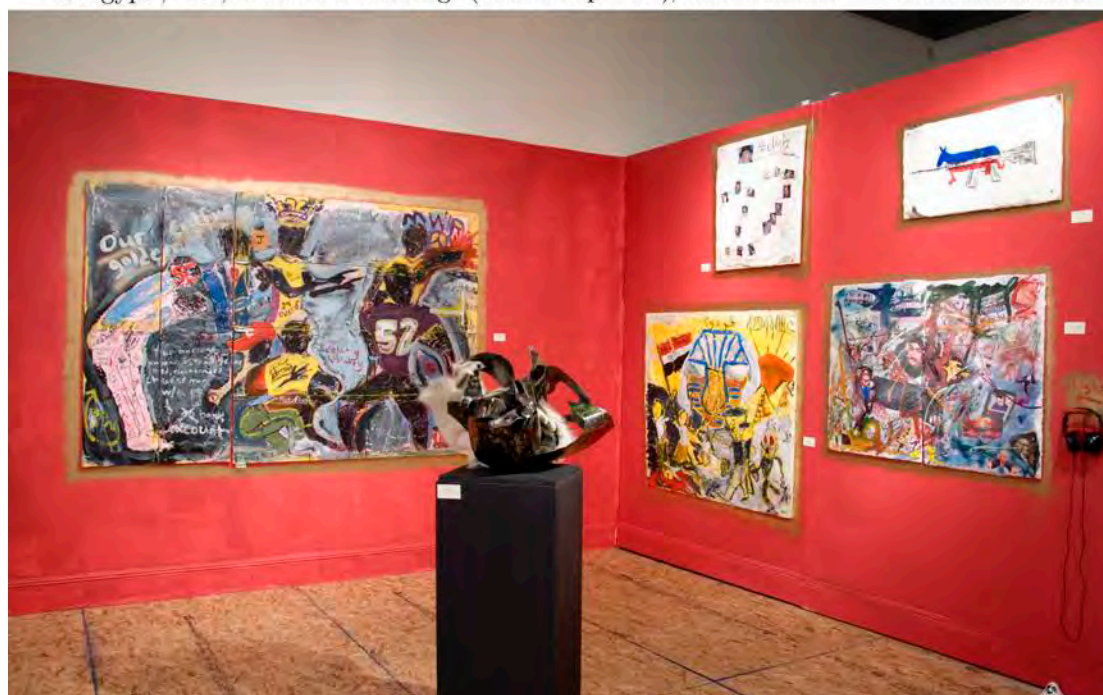
In the process, I am distilling my perceptions of an entropic, hyper-social, information-based world to its core. Through the use of written words, straight forward, and basic imagery devices, I seek to direct the viewer's attention to truths that are self-evident but not always openly acknowledged.

Picasso said, "All children are artists. The problem is how to remain an artist once he grows up." Picasso was alluding to the power of basic imagery. To children, prehistoric man, or the untrained, art is very representational and direct. There is no knowledge of perspective, value, composition, but just the idea that is trying to be conveyed. This is what I do with my art.

To start, I cover wooden boards in plaster and then sand that plaster once it has dried. I do this to evoke the notion of a cave wall. Once the plaster has been sanded, I paint using that basic imagery. I mix charcoal, Sharpie, acrylic and oil paints on to the same cave walls and my human imagery is very basic to harken back to prehistoric man. Symbolism is very strong in my work as it has a deep evolutionary connection with all of us. I try to play to that strength. I also rely on other mental devices and visual tricks to encourage the viewer to pay attention to the piece.



Installation with "Apollonysus" (Sculpture on pedestal), flanked by "Our Golden Calvez", "Goegypt", "27", "Pollock is Shaking" (with headphones), and "Untitled" Zach DeBernardi





(Above) "Goegypt"

Zach DeBernardi

"Nada" (Below)





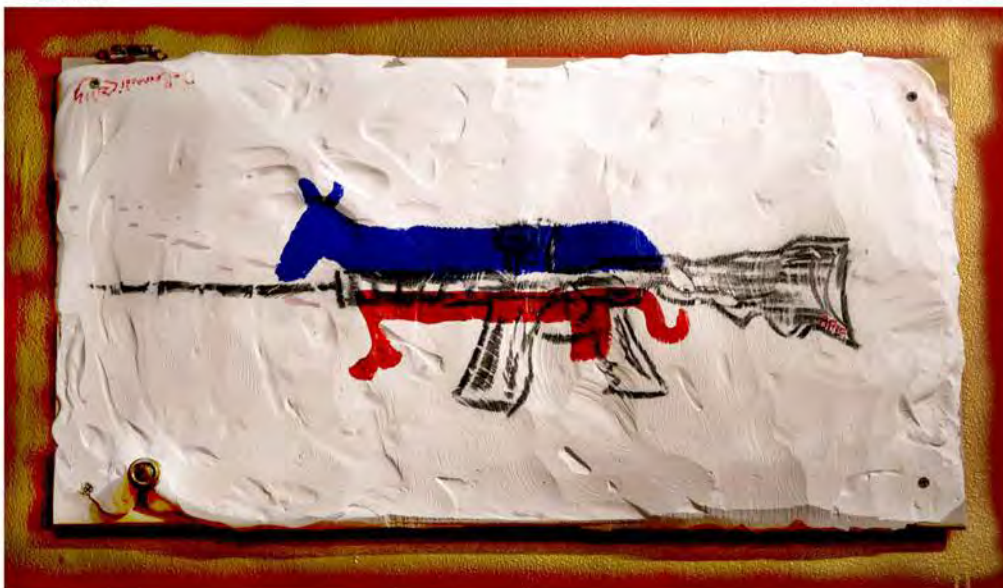
"Our Golden Calfvez"

Zach DeBernardi



"Untitled"

Zach DeBernardi



"XVI"

Zach DeBernardi

1.21 The Transformation or Stagnation of Henry VIII

Timothy F. Fowler
Advisor: Richard R. Heiser, Ph.D.
Department of History

On the 22 of April in 1509 Henry VIII gained control over England after his father passed away that very day. Only two months away from his 18th birthday Henry had become the ultimate power in England. Descriptions of Henry are very consistent from letter to letter and author to author describing Henry as a very intelligent, well-rounded individual. This research addresses whether or not Henry VIII changed over his years as a ruler or did he remain the same. If there was change would it have been caused by relationships, especially with his wives, or with his many advisors? Could there have been certain physical problems that began to build up and cause him severe health problems over the years? The focus of the research is how Henry VIII tarnished his reputation and leaves us how he is remembered today.

1.22 Kudzu Inhibits the Germination and Development of *Monarda didyma* and *Penstemon digitalis* by Allelopathy.

Theresa C. Freeman
Advisor: Suann Yang, Ph.D.
Department of Biology

Kudzu can inhibit native plant species from germinating and developing. The author hypothesizes that allelochemicals found in kudzu's leaf litter inhibit the germination and development of native plants by allelopathy. A germination bioassay was conducted to examine the effects of kudzu leachate on germination and development of *Monarda didyma* and *Penstemon digitalis*. Kudzu leachate inhibits the germination of *M. didyma*. However, the kudzu leachate does not inhibit the germination of *P. digitalis*. Kudzu leachate inhibits the root development of *M. didyma* and *P. digitalis*. Further research includes isolating phenolic compounds from the kudzu leachate to examine the effect of phenolic compounds on the germination, development, and growth of *M. didyma* and *P. digitalis*.

1.23 Tudor Women and Their Role in the English Reformation

Thomas R. Geene
Advisor: Richard R. Heiser, Ph.D.
Department of History

Although the spread of the Protestant Reformation was successful in Tudor England, little attention is placed on the influential role women played to its advancement. The goal of this project is to elucidate the significant role women had in the expansion of this movement, highlighting which women played a key role. Ultimately, this research outlines how women, Anne Askew, Anne Boleyn, and Katherine Parr played a crucial role in spreading the Reformation Movement within England.

1.24 England versus France: Unearthing Linguistic Identity through Early Modern Lexicography

Mary Ellis Glymph
Advisor: J. Justin Brent, Ph.D.
Department of English

Global culture is becoming more and more unified due to technological advances; consequently, languages must be able to adapt to this change in order to participate adequately in economic, social, political, and cultural dialogue. Some languages, like English, have been able to adapt to these rapid changes easily because of their use of linguistic descriptivism; however, languages like French have had much greater difficulty adapting to change due to their prescriptive nature. This research poses a theory of how these two specific countries developed their attitudes toward language, and it decides that lexicographical foundations were a significant influence on these evolutions. The foundational English dictionary of Samuel Johnson in 1755 and the French foundational dictionaries of the Acadmie Franaise influenced the development of descriptive and prescriptive attitudes in England and France. In these countries, lexicography was both influenced by culture and influential of culture, and because of this impact, seventeenth- and eighteenth-century dictionaries of yesterday have made a remarkable impact on linguistic culture and development today.

1.25 Microscopic Characterization of Maize Leaves using Fouders of the NAM Population

Julia M. Goeckel
Advisor: Stuart G. Gordon, Ph.D.
Department of Biology

The plant leaf microstructure is believed to affect bacteria on the surface of the leaf. Density of stomates and trichomes was examined across different maize genotypes. A section of the top, middle, and bottom were taken from one leaf for each genotype and examined using a scanning electron microscope and pictures were taken at 200 \times . Trichomes and stomates were counted for each genotype. The results showed there is a difference in trichomes and stomates among maize genotypes and this could possibly affect the growth of bacteria on the surface of the leaves.

1.26 Y-Site Physical Compatibility of Intensive Care Unit Admixtures with Cisatracurium

Lyndsay R. Gormley
Advisor: Jaime A. Foushee, Pharm.D.
Department of Pharmacy Practice

Critically ill patients often require multiple intravenous (IV) continuous infusions throughout their intensive care unit (ICU) stay, sometimes necessitating the co-administration of medications in patients with limited access. IV compatibility of these medications is lacking, with recent drug shortages requiring practitioners to utilize therapies with little to no compatibility data. This study will examine the physical compatibility of the neuromuscular blocking agent cisatracurium with selected continuous infusion therapies. Physical compatibility was checked in triplicate using visual assessment against both light and dark backgrounds and non-visual changes in turbidity with a turbidimeter. Assessments were made in 15 minutes increments up to one hour, to account for contact time in a simulated y-site. A measured turbidity difference of less than 0.5 NTU was considered compatible. Analysis of variance was used to determine

statistical difference between the experimental groups and controls. Calcium gluconate, diltiazem, esomeprazole, regular insulin, nicardipine, and vasopressin demonstrated no evidence of physical incompatibilities with cisatracurium after visual and turbidimetric assessment. Although the presence of particles, haze, gas formation or alteration of color were not visibly notable in admixtures of pantoprazole with cisatracurium, the turbidity of the admixtures was 0.31 ± 0.21 NTU greater than controls. Although less than the 0.5 NTU benchmark, the turbidity of pantoprazole admixtures was statistically different from that of controls ($p < 0.001$). Additionally, cisatracurium-pantoprazole admixtures demonstrated an increase in turbidity over 60 minutes of 0.44 ± 0.26 NTU. Practice guidelines require a minimum of physical compatibility to co-administer IV medication therapies. Calcium gluconate, diltiazem, esomeprazole, regular insulin, nicardipine, and vasopressin demonstrated physical compatibility with cisatracurium over a one-hour period. Cisatracurium and pantoprazole should not be co-administered at this time due a statistical difference in compatibility between control and experimental groups.

1.27 The Relationship Between Religion and Happiness

Patrick D. Haile

Advisor: Robert H. Freymeyer, Ph.D.

Department of Sociology

Church attendance has decreased over the past several decades in the United States, yet happiness has remained relatively constant. Religion and happiness are two aspects of many people's lives. This study examines how religion affects happiness. Using 2010 data from the General Social Survey, I hypothesize that individuals who are more religious will report a greater sense of happiness. Several different measures of religiosity will be used. This study will give some valuable insight into the relationship between religion and happiness. Ultimately, church attendance and self-reported religious strength are the best indicators of the relationship between religion and happiness.

1.28 Protein Kinase C Gamma Expression in the Periaqueductal Gray Following Peripheral Endothelin-1 Administration

J. Tyler Hammett

Advisor: Sarah M. Sweitzer, Pharm.D.

Department of Pharmaceutical Sciences

Sickle cell disease (SCD) is a genetic condition that produces sickle shaped red blood cells resulting in repeated painful vaso-occlusive episodes (VOE) in children with the disease. Currently, patients with SCD report inadequate pain control despite the use of current pain medications. Endothelin-1 (ET-1) is used to model VOEs and identify novel analgesic therapeutic targets. Prior research shows the greatest ET-1 induced nociception in younger male animals. The mechanisms for these age and sex differences are under investigation in our lab. Protein Kinase C gamma (PKC) has been previously shown to play a role in central nociception with expression in the spinal cord, thalamus and periaqueductal gray (PAG). The purpose of this study is to look at expression of PKC in the PAG in a model of VOE-associated nociception. The author postulates an age- and sex-dependent increase in PKC expression following administration of ET-1. Immunohistochemistry was performed on PAG tissue obtained from postnatal rats of ages 7, 21, and 60 days. Direct cell counting was used to determine the number of PKC expressing neurons. Results from the P21 age group suggest a greater level of activation in rats treated with ET-1 as opposed to those treated with saline. ET-1 treated females show a higher level of PKC expression in the dorsal PAG than do males. ET-1 treated males show a higher level of PKC expression in the ventral and lateral PAG than do females. Overall, this suggests males have higher levels of PAG PKC expression following ET-1 administration.

1.29 Elizabeth I: Ascending the Throne Against all Odds

Mary Catherine Heard
Advisor: Richard R. Heiser, Ph.D.
Department of History

The monarch who led England through its Golden Age and was hailed as Gloriana and Good Queen Bess had a turbulent first twenty-five years before she became England's ruler. Elizabeth I's path to the throne was a difficult one because of her atypical upbringing and her siblings' religious statuses when they were on the throne.

1.30 Development of Siderophore-conjugated Antimicrobials for the Treatment of Topical Wound Infections

Jasmine N. Herndon and Reona K. Broadwater
Advisor: Kristopher G. Virga, Pharm.D.
Department of Pharmaceutical Sciences

The purpose of this research was to develop a successful topical agent specific to *Staphylococcus aureus* that will provide necessary treatment if used early enough. The primary goal was to make siderophore-conjugated antimicrobials that would act against the infected cells. Due to the inability to for this conjugate to cross the cell membrane, Coenzyme A was produced. This combination of the siderophore-antimicrobial and Coenzyme A is known as the "Trojan Horse" delivery system. The the system will be transported via the iron that the bacteria will want to consume. This conjugation will provide a successful, more potent antimicrobial topical agent that will suppress the growth of a *Staphylococcus aureus* biofilm build-up.

1.31 Taking Guernica by the Horns: Modern Art's Battle to Avoid the Flames

Mary Honan
Advisor: Laura J. Crary, Ph.D.
Department of Art History

This research analyzes the art being produced and commissioned under Suppressive regimes and the effects these strict governments had on the art world at this time. Beginning in the years leading up to World War II and looking at some modern day governments, the author investigates whether art, especially Modern art movements, were able to flourish in spite of the harsh restrictions placed upon them or if these restrictions were enough to transform art into merely a tool used for propaganda in specific parts of the world.

1.32 "GREEK" and Gender Inequality

Graham A. Hope
Advisor: Carla H. Alphonso, Ph.D.
Department of Sociology

Within Greek Letter Organizations (GLOs), issues related to the dis-empowerment of women continue to be problematic. The objectification of female college undergrads exemplifies how women are persistently subjugated and coerced into conforming to men's desires. This idea has serious implications on a macro-sociological scale when one considers that college campuses are a microcosm of broader society. The objectification of female college undergrads is the result of age-old social phenomena including institutionalized gender roles, expectations and inequality, which

result in serious psychological disorders such as body image disturbance and eating/exercise disorders, the reproduction of gender inequality, and even sexual assault and date/marital rape. These concerns have existed for decades and likely will continue to effect women for years to come, unless serious activism takes place in the near future. This presentation will survey scholarly research related to many of these issues, analyze a medium of popular culture to search for gender-related patterns within the portrayal of GLOs, and create an exposition of ideas that synthesizes the findings of scholarly research and the media analysis.

1.33 The Positive Effects That Occupational Status Has on the Health and Well Being of Workers

Derl J. Howard

Advisor: Robert H. Fremeyer, Ph.D.

Department of Sociology

Occupational prestige has an effect on the health status of workers. This study measures the health levels of workers according to their level of prestige at work. I predict individuals with a higher occupational prestige will have better health. Data from the 2010 General Social Survey (GSS) are used. I hypothesize that workers with higher occupational prestige will have better health than workers with lower occupational prestige.

1.34 Mathematical Analysis of Braided Rope

Mitchell J. Isaac

Advisor: Chad L. Rodekoher, Ph.D.

Department of Physics

Humans have been twisting and braiding rope for thousands of years. Rope is extremely useful. Today it is used in towing, securing, construction, and sports. It is also used in pulleys and many other pieces of machinery to create mechanical advantages. To be so widely used for so long, there is not much known about what mathematically makes one rope better than another. Right now experiments are being conducted on different types of ropes and massive amounts of data are being taken. Progress is being made in that empirical equations are beginning to be discovered; however, being empirical, these equations are not general to all ropes, but instead are specific to certain types of ropes under certain parameters. We have worked in conjunction with Auburn University Department of Polymer and Fiber Engineering to analyze data collected and to incorporate the empirical equations known, to determine analytical equations that may apply to all braided ropes. The implications of this project could result in making the world of rope making a science fully describable with mathematics. If rope braiding were analytically known, then currently impossible ideas (such as space elevators) may become possible.

1.35 Bushido or Bull? Justifying Japanese War Violence Through Culture

McKenzie R. Jackson

Advisor: Stefan W. Wiecki, Ph.D.

Department of History

The harsh and violent war tactics of the Japanese during World War II were easily justified through the “Way of the Samurai,” the Bushido Code, which claimed that Japanese soldiers would fight and die by the sword. Glorifying death meant that any other action would be considered disgraceful and dishonorable, and for Japanese soldiers, this also translated over as

to how they treated their enemies, torturing and killing them in some of the most horrific, violent ways possible. While it is believed that the soldier's aggressive actions were justified through their Japanese culture, it is debated and questioned just how strongly did culture correlate with and influence Japanese war violence.

1.36 The Myth of Resistance: The Evolution of Italian Representations of the Holocaust

Emily A. James
Advisor: Stefan W. Wiecki, Ph.D.
Department of History

In the decades following the end of World War II, Italy, along with the rest of Europe, faced the task of working through the tragedy of the Holocaust. Participation in the discrimination and, later, deportation of Jews in Italy was not as clear-cut as in other areas. This ambiguous grey area allowed for blame to be pointed away from Italians and for a myth of complete resistance to form. My project will look at Italian films from the 1940s to the 2000s to show the progressive change in how Italy chose to represent their participation in the Holocaust. The journey to admission of, at least partial, Italian guilt is still in progress, but large strides have been made in the past decade as the myth of total resistance has faded, and a realization of truth has shone through.

1.37 The Evaluation of Triclosan Transdermal Penetration Using a Parallel Artificial Membrane Permeability Assay (PAMPA)

Meredith S. Jenkins
Advisor: C. Scott Asbill, Pharm.D.
Department of Pharmaceutical & Administrative Sciences

The lipophilic compound, triclosan is commonly used as an antimicrobial agent in multiple household items such as detergents, soaps, toothpaste, deodorants, and many sanitizers. Due to its increased usage, triclosan is now an environmental contaminant that is toxic to many aquatic species. Many products containing triclosan are used topically and antiseptically and often in combination with alcohol, which could increase the permeation of triclosan through the skin. However, the degree to which triclosan is absorbed through the skin as well as its toxicity is poorly understood. The aim of this study is to evaluate the transdermal penetration of triclosan using an in vitro PAMPA model and the toxicity of triclosan in human keratinocytes and fibroblasts. In addition, we have conducted toxicity studies using the aquatic species *Daphnia*. Preliminary results have demonstrated that *Daphnia* has a higher sensitivity to triclosan than human skin cells.

1.38 Functional Analysis of the Maize Phyllosphere Microbiome

Allison S. Karabinos and Katie Wilson
Advisor: Stuart G. Gordon, Ph.D.
Department of Biology

A primary habitat for microorganisms is the maize phyllosphere, the leaf surface of the plant. Metagenomics techniques based upon DNA sequence analysis allow these microorganisms to be taxonomically classified and functionally analyzed in order to identify these microbes and to determine their function and how this function equips these microbes for their unique environment. Utilizing iPlant Collaborative, 32 metagenomic samples (of 4,000-44,000 reads) from the

phyllosphere of NAM founders were analyzed in order to determine taxonomy and to provide functional analyses. Taxonomy was identified using BLAST, and further taxonomic classification and functional analysis was determined using MEGAN4 via the SEED and KEGG classification mechanisms. These methods highlight the functional similarities between the samples in relation to the different microbial composition of the samples as well as allow relationships to be inferred regarding the interactions between the microorganisms and the plant. For a subgroup of these phyllosphere metagenomic samples, in addition to a marine sample, the Canberra Stability Indicator, a metric that quantifies the disorder among pairs of ranked lists and is a useful technique in comparing ranked lists in functional genomics, was calculated. Individual enzymes within each sample were numerically ranked according to their abundance. The stability indicator was calculated for differing numbers of enzymes (top 100, 250, 500, and 1000 hits) between the samples, quantifying the stability of the enzymatic composition of each of the samples, i.e. the functional stability of the samples. Values ranged from 0.36 to 1.30, and as the size of the ranked lists increased, the stability between the samples also increased. These bioinformatics methods can potentially lay the foundation for future applied breeding efforts that target the growth of microorganisms with specific functional capabilities that may help the plant to withstand certain stressors, including drought.

1.39 Bending History: Martin Sherman’s Bent and the Evolution of Popular Portrayals of Gay Holocaust Victims

E. J. Patrick Kennedy II
 Advisor: Stefan W. Wiecki, Ph.D.
 Department of History

This study will use Martin Sherman’s 1979 play “Bent” as a lens to understand the significant shift in how gay victims of Nazi persecution have been portrayed in popular media from 1945 to the present day. For many decades after World War II, gay victims were either ignored or, in some cases, used as scapegoats for Nazi atrocities. Sherman’s work had enormous influence in raising the fate of gay victims to popular consciousness; however, it also ignited heated political discourse and led activists to frame the AIDS crisis of the 1980s in terms of a second “gay holocaust.” This study will examine “Bent”’s historical accuracy and will consider the implications the plays popularity has for modern Jewish, LGBT, and academic communities.

1.40 The Female Nude in Art History: Depictions and Implications

Meghan R. King
 Advisor: Laura J. Crary, Ph.D.
 Department of Art History

Paul Gauguin’s painting Two Tahitian Women raises many questions about the use of the Female Nude in art. This presentation will examine different depictions of the Female Nude throughout art history, including the Femme Fatale, the artist’s model, and women as nature.

1.41 From Offshoring to Reshoring

Andrew C. Kocis
 Advisor: Suzanne J. Smith, Ph.D.
 Department of Economics and Business Administration

The offshoring of manufacturing operations from the United States to China has been one of the most publicized effects of China’s dramatic global economic emergence. For years, American companies seized the opportunity to achieve greater profits by taking advantage of the lower

labor costs and reduced regulations by moving manufacturing from the United States to China. However, recent trends indicate this practice may be rapidly reversing. Many companies now find it cost-effective to reshore operations from China back to the United States.

1.42 The Effects of Texting on Cognitive Mapping and Working Memory

Lindsay N. Krause and Margaret E. Stalls
Advisor: Sarah C. Burns, Ph.D.
Department of Psychology

Psychology students were asked to complete a texting task while walking through a designated course. In this experiment, participants walked the course with and without the distraction of texting. The time and number of steps were recorded to determine the effects of texting on cognitive processing and cognitive mapping. Participants also walked the course while listening to lyrical music to ascertain which area of the working memory is most affected by a texting task.

1.43 The Changing Roles of Women in Nazi Germany

Allston A. LaBruce
Advisor: Stefan W. Wiecki, Ph.D.
Department of History

This research investigates the role of women during Nazi Germany, specifically how during the early years of World War II women were encouraged to have children and increase the population, but as the war continued women were then expected to work in the factories and impact the war industrially as opposed to domestically. The research will explain how the Nazi regime changed their opinions on family ideals through speeches, propaganda and various documents given to the German people.

1.44 Bloody Mary

Janet E. Langley
Advisor: Richard R. Heiser, Ph.D.
Department of History

Mary Tudor, Queen of England, began her reign as one of the most celebrated and accepted monarchs in the history of England. However, by the end of her reign she was dubbed “Bloody Mary” and was hated and feared by her people. Looking back on the abuse Mary suffered before she was crowned, her tumultuous childhood was the reason for the decisions she made while she was queen.

1.45 Synthesis of Gold and Silver Nanoparticles in Deep Eutectic Solvent: Potential Catalysts in the Relaxation of Supercoiled DNA

Julianne P. Lenti
Advisor: Latha A. Gearheart, Ph.D.
Department of Chemistry

Many different applications for nanoparticles are arising each year, especially metal nanoparticles, which have incomparable structure-functionality properties that most other nanoparticles do not possess. Metal nanoparticles typically synthesized in the past have used water, organic solvents,

or other un-environmentally friendly solvents; however, when synthesizing the nanoparticles in a deep eutectic solvent, it is possible to achieve greater surface area per weight ratios with their small size, which is beneficial to their applications in catalytic ability. Deep eutectic solvents also provide a more stable, cheaper, and environmentally friendly solvent. The synthesis of gold and silver nanoparticles in a deep eutectic solvent of choline chloride and urea should be possible by the chemical reduction of Au^{3+} and Ag^{+} metal salts. These nanoparticles will be tested as catalysts for the relaxation of supercoiled DNA by a topoisomerase I biocatalyst.

1.46 Whose Wife is She Anyway?

Joseph M. Lettig
Advisor: Richard R. Heiser, Ph.D.
Department of History

This research examines Henry VIII and his different marital arrangements. A variety of sources will be used to demonstrate the justification behind his actions. Was he truly trying to make England the dominant European country, or was he merely acting out of his own personal interest?

1.47 Broker of Power: Alexander McGillivray, Politics, and Diplomacy in the 18th Century Creek Country

William F. Lewis
Advisor: Sara E. Lampert, Ph.D.
Department of History

After the American Revolution in 1783, the Creek Indians experienced a dramatic upheaval of their society. For decades, the Creek nation had relied upon the assistance of British trade and protection till their departure after the American Revolution. After the Revolution, the American Republic began encroaching on Creek hunting land, which threatened the sovereignty of the Creek nation. In 1783, the Creek Chief Alexander McGillivray began to work to centralize Creek political power and uphold the sovereignty of the Creek nation. Further, this research attempts to understand the complex world of 18th century Southeastern Indian politics and diplomacy.

1.48 Impact of Medication on Driving

Kaitlyn N. Lollis
Advisor: Walter R. Ott, Ph.D.
Department of Chemistry

This study explores the relationship between elderly patients taking prescription or over-the-counter medications and their respective driving abilities. In this experiment, blood and urine samples of participants will be analyzed for specific medications using liquid chromatography/mass spectrometry. Different chromatography techniques will be tested to determine the best method for analyzing these samples. Resulting blood and urine analyses will be compared to the participants driving tests to test for associations between the medicines and driving habits.

1.49 Tearing into the Written World

Joseph A. Lookabill

Advisors: Mark R. Anderson, M.F.A. and Ralph H. Paquin, Jr., M.F.A.

Department of Art

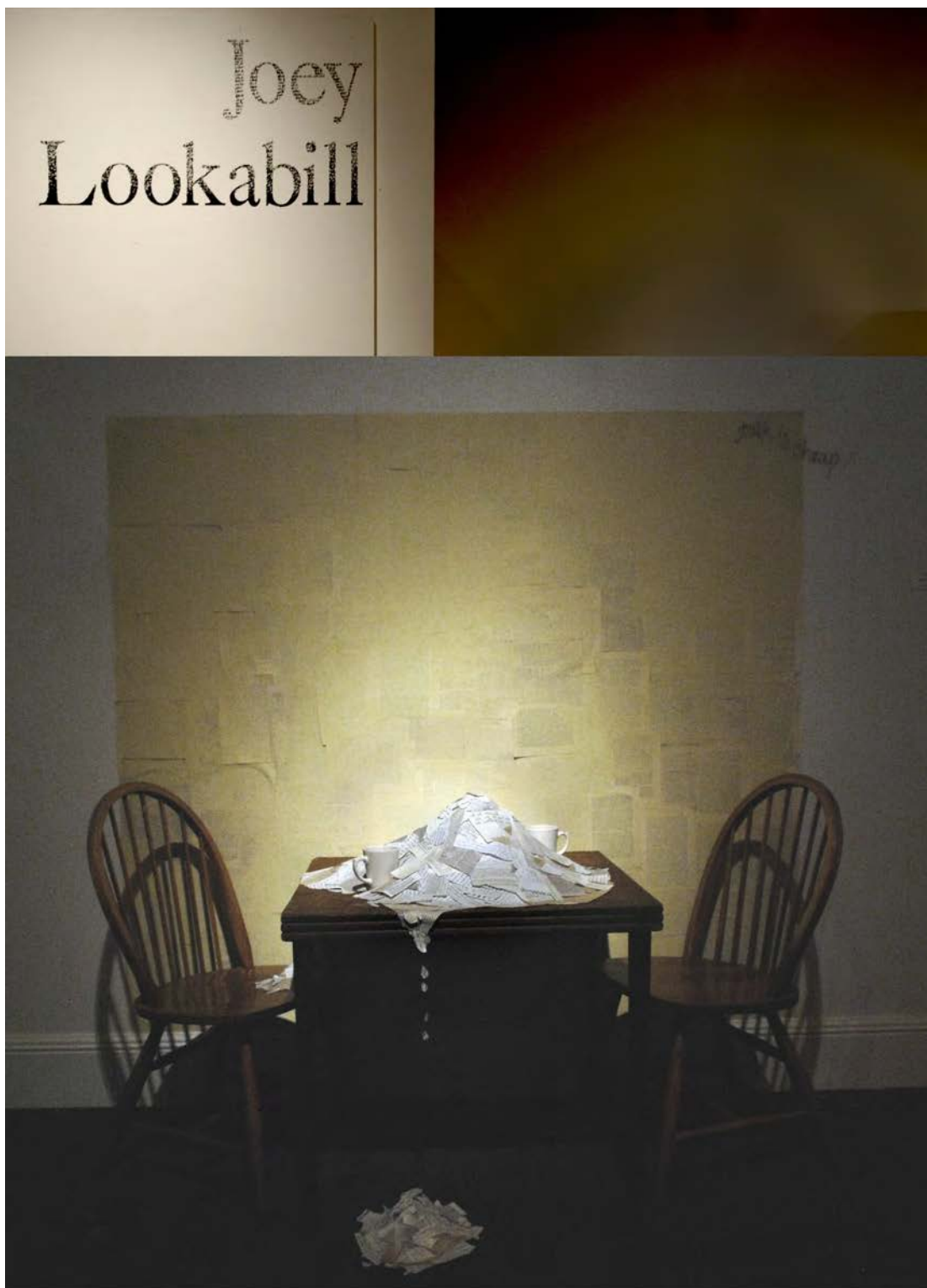
I feel as if much of my artistic journey has been leading me towards installation art from the beginning. When I took my first art classes, three years ago, I only wanted to work in two-dimensional mediums, over which I felt complete control. Being a perfectionist, my work lacked a lot of the looseness required for spontaneous work. When drawing and painting were not engaging enough, I hesitantly moved into sculpture and tried new types of art. Gradually pushing beyond even those boundaries, I attempted to combine each new medium with the last, letting two and three-dimensional forms interact. When the idea of installation pieces first entered my mind, I was a bit terrified, but I knew I had to take the risk or I would be disappointed later. Through the process, I've begun to learn that art can begin to transform the gallery, rather than just occupy it, and it can create a whole new atmosphere separate from what surrounds it.

One constant throughout this journey has been my love of paper, especially when antique or aged. Even when I was young, I preferred the feel of an old book to the newer and shinier ones. As I made the transition into the art world, this became my medium of choice. I first drew on printed pages, then collaged them, eventually carving into books and tearing them up to create new things. When used in sculptural terms, paper takes on a wonderful duality: It is both delicate yet visually powerful; a commonplace object, but which is given special meaning by whatever is printed upon it. Art became not a form of wordless expression, but a way to express words.

My pieces deal with these fundamental units of communication. This series explores different aspects of words in our day-to-day lives, from meaningless chatter over morning coffee to the text of a particularly powerful book. The focus centers on the inadequacies and challenges we come up against when our words fall short or go too far, and I find these by delving into the written world.

Since language is such an integral and universal part of our daily lives, it is possible for anyone to find a bit of themselves in each piece. I want my art to be absorbing and relatable. By using handwritten and typed text to represent the idea of words, it becomes easier for one to impose their own meaning upon each installation. The setting of furniture and household items bring the idea that these are challenges we face in our own lives, all the time, sometimes even within our own homes. And finally the use of paper itself mirrors the malleability and surprise of words themselves. Some pieces are fastened, some are loose, but every piece is still flexible, easily torn, changeable – almost even fluid – just like language.

I have found the experience and process of creation to be very meaningful and thought-provoking for me, in its complexity and spontaneity. I can only hope that viewing my art will have the same effect on you.



"Coffee Talk"

Joey Lookabill

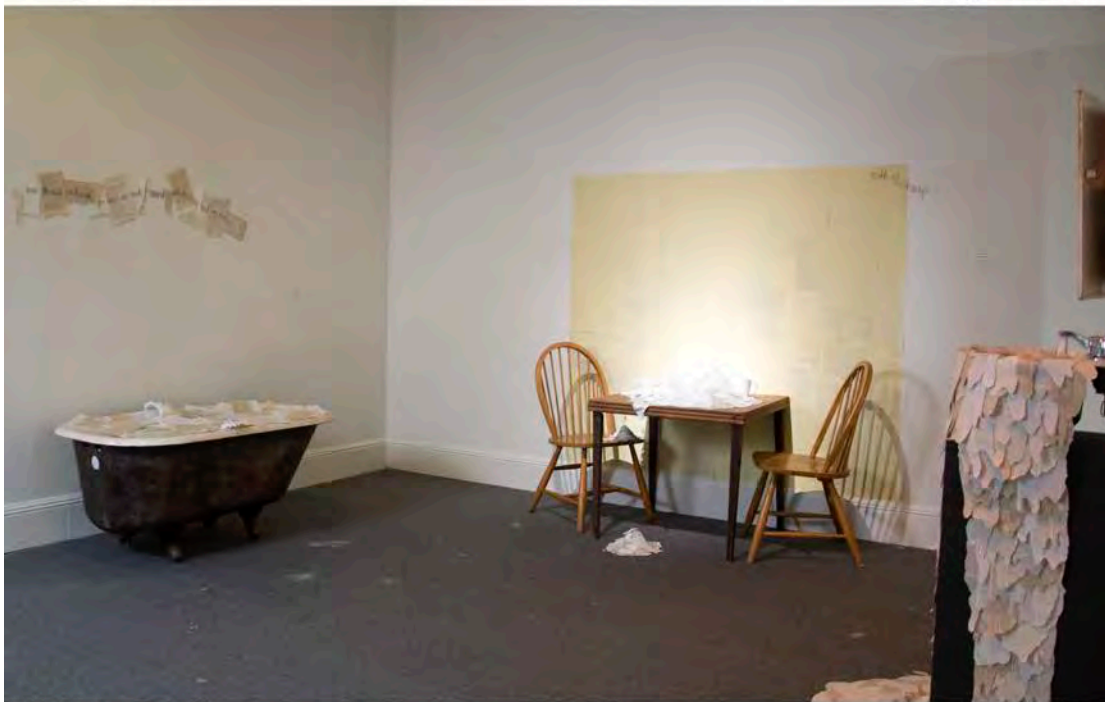


"And He Read..." (with detail above)
Joey Lookabill



"Tongue-tied"

Joey Lookabill



Gallery Installation

Joey Lookabill



"Overflow"

Joey Lookabill

1.50 Tudor Punishment: A History Blemished by Public Executions

Aaron R. Mayes

Advisor: Richard R. Heiser, Ph.D.

Department of History

During the Tudor period, petty crime was prevalent throughout England. The rise in crime in London brought about new legislation that outlined how to deal with these criminals. The punishments were undoubtedly cruel, and many public executions were carried out. However, the attempt to punish criminals as a whole was not as harsh as the big picture portrays.

1.51 Using Herpes Simplex Virus Mediated Gene Therapy to Decrease Neuronal Activation in Neuropathic Pain

Joanne K. Petz

Advisor: Sarah M. Sweitzer, Pharm.D.

Department of Pharmaceutical Sciences

Over 75 million Americans suffer from chronic neuropathic pain, costing over 150 billion US dollars per year. Half of the patients with neuropathic pain are unresponsive to analgesic treatments or suffer from central nervous system (CNS) related side effects. The goal of this project is to use herpes simplex virus type 1 (HSV-1) to target peripheral neurons to produce analgesia without CNS side effects by over-expressing or knocking down expression of the delta opioid receptor (DOR). Our laboratory has previously shown an increase in nociceptive behaviors with HSV-mediated over-expression of DOR, and a decrease in nociceptive behaviors with HSV-mediated knock-down of DOR. My hypothesis is that downregulation of the DOR will decrease c-fos expression in the spinal cord, and over-expression of DOR will increase c-fos expression. C-fos is a marker of neuronal activation that is measured by immunohistochemistry. Results showed that c-fos significantly decreased after knock down of DOR expression. This signifies that DORs interfere with peripheral analgesia, and that the knock down of DOR expression increases peripheral analgesia. This supports a growing theory of pronociceptive MOR-DOR heterodimer formation in chronic neuropathic pain states.

1.52 The Effects of Carbon Source on Growth Rates of *Acidovorax* Mutants

Ayla R. Pittman

Advisor: Stuart G. Gordon, Ph.D.

Department of Biology

Acidovorax avenae subsp. *avenae* is a betaprotea bacterial pathogen of maize and other grasses. In order to better understand the pathological mechanisms this bacterium possesses, a more complete understanding of its biology is necessary. To achieve this more complete understanding, random transposon mutagenesis of the *Acidovorax* genome was conducted. A subset of mutants was selected for characterization of growth rates on different carbon sources in a M9 minimal broth. Based on a previous experiment, succinate, glucose, dextrose, maltose, mannitol, and xylose were the chosen carbon sources. Genetic material from the seven chosen mutants grew overnight in LB broth. The cells were then washed and resuspended in a saline solution. In three 24 well plates, each mutant was placed in a small amount of each carbon source. The plates were placed in a plate reader and each well's absorbance was read every 12 hours over 96 hours. Two replicates of this experiment were preformed. Links between growth rates and mutated genes will be reported.

1.53 Child at Heart

Cullie R. Reynolds

Advisors: Mark R. Anderson, M.F.A. and Ralph H. Paquin, Jr., M.F.A.

Department of Art

My earliest memory of drawing was when I was about six or seven years old. I was on a plane trying to pass the time by drawing a horse from a calendar. Ever since then I have been painting, drawing, and sketching horses. Yes, I was one of those typical horse obsessed little girls you find in every group.

When I came to PC and started working on my art degree, I tried to venture out of my comfort zone and experiment with other media and subject matter by learning everything from painting to sculpture to ceramics. While I have enjoyed all of the art classes I have taken, I found myself struggling to come up with inspiration when I was doing my own work, finding it difficult to discover what best fulfilled me as an artist. Through a lot of trial and error, I began gravitating back to drawing, which is the medium that comes most naturally to me. I enjoy playing with *conté* and blending it into just the right shade in just the right place so as to make a realistic image appear.

The subject matter I prefer, horses, has always been familiar and comforting to me as well; just the smell of a barn puts me at ease. It is something you cannot understand unless you have experienced it yourself. Capturing the essence of a horse is not easy, but it is something I enjoy trying to do. It comes naturally to me to draw something I am so familiar with and that I am so passionate about. I believe people are intrigued with horses because they represent something wild and powerful, and yet, like people, these creatures also have a need to have relationships. Initially, I resisted my inclination to draw horses, instead trying to do other forms of art with subjects that were less predictable and not as familiar to me. In the end I just cannot deny what makes me happy. Even though some may think me a silly, horse-obsessed girl, I have chosen to do what I love and love what I do. I believe that is one of the most important things in life.



Gallery Installation

Bess Reynolds

"Take a Bow"



Robins Eternal

Bess Reynolds



Lazy Lope

Bess Reynolds



Sweet Comfort

Bess Reynolds



Dante

Bess Reynolds

1.54 Native American Involvement in American Society after World War II

Zachary T. Robertson
Advisor: Stefan W. Wiecki, Ph.D.
Department of History

The purpose behind this project is to determine whether or not the involvement of Native Americans during World War II help to propel them into every day society in the United States. During World War II, Native Americans became a key component in the Pacific theatre by using their unwritten language as code for Marine forces. Through this involvement, Native Americans and Marines were forced to co-exist and develop friendships with each other. Through research, I will show how this involvement helped Native Americans to become more involved in American society when they returned home.

1.55 Phenotypic Response to *Acidovorax avenae* Infection in the IBM 94 Maize Population

C. Lindsay Rutledge
Advisor: Stuart G. Gordon, Ph.D.
Department of Biology

Corn is cultivated on 79 million acres in the US, and its value is in excess of \$50B. *Acidovorax avenae subsp. avenae* (Aaa) is a bacterial pathogen that infects maize, causing bacterial wilt. Shredding infected leaves and causing leaf streaks, bacterial wilt can cause serious crop damage, especially in sweet corn. There exists variation in the susceptibility of maize genotypes to Aaa. The object of this study was to identify the loci responsible for resistance through inoculation of 95 recombinant inbred lines (RILs) of the intermated B73 and Mo17 (IBM) maize population, and to quantify their subsequent reactions.

1.56 Economic Impact of Presbyterian College on Laurens County

Abby C. Scott and Kayla A. Yerden
Advisor: Normal M. Scarborough, M.S.
Department of Business and Economics

The primary focus of our research was to determine the economic impact of Presbyterian College on Laurens County, South Carolina. We used IMPLAN economic impact software to determine the direct, indirect, and induced effects of spending within the county attributed to the presence of both the College of Arts and Sciences and the Pharmacy School. Into this model, we entered the expenditures of the academic institution, as well as monthly spending data gathered from faculty, staff, and student surveys. This project reveals the number of jobs and dollars that Laurens County would not have without Presbyterian College.

1.57 Does Money Truly Buy Happiness?: A Study of 157 Countries' Levels of Happiness and the Contributing Factors

Rebecca J. Settle
Advisor: Robert H. Freymeyer, Ph.D.
Department of Sociology

Happiness is something that everyone strives for in life. However, what truly makes someone happy? While the age old saying that “money can buy happiness” might remain true, other

factors should be considered as well, including both individual and contextual ones, to see what really influences happiness. Using the 2005-2008 wave of the World Values Survey, this research examines various factors that could affect levels of happiness in different countries. I expect to find that, while there are many contributing factors, people who live in a country where they have a higher level of freedom are more likely to be happier. Thus, more descriptive insights will be brought forth about the true influences on happiness around the world.

1.58 The Relationship between Education Levels and Views about Foreign Aid

Rebecca J. Settle

Advisor: Robert H. Freymeyer, Ph.D.

Department of Sociology

Foreign aid is a highly debated topic in the United States today. There are many different opinions regarding whether or not we should continue to give out foreign aid. However, what influences these opinions? The 2010 General Social Survey is used to examine whether the level of education has an impact on a person's views about foreign aid. I expect to find that people with higher levels of education will be more likely to support foreign aid. This research will provide insights on what influences views on foreign aid to help resolve the debate on foreign aid.

1.59 Are Thermal Islands Real In Small-Scale Cities?

Edward K. Snead IV

Advisor: James A. Wanliss, Ph.D.

Department of Physics

The purpose of this project is to determine whether thermal islands, areas where the temperature is greater than the surrounding area, exist in small towns and cities. Data from small cities and towns in the upstate of South Carolina are analyzed to detect the appearance of a trend. The minimum city size to have an effect on the temperature of the surrounding area is explored. This research will test the definitions of urban areas, and the assumptions that the temperature scale is indeed affected by urban areas and hopefully give an answer as to what characteristics an area has to have to create these effects on the temperatures.

1.60 Y-site Physical Compatibility of Commonly Used Medications in an Intensive Care Unit: A Focus on Esomeprazole, Electrolyte, and Insulin Infusions

Megan D. Sumner

Advisor: Jaime A. Foushee, Pharm.D.

Department of Pharmacy Practice

Multiple intravenous drug therapies are often needed to care for intensive care unit patients. Many of these medications do not have published compatibility information for co-infusion, thus patients may require multiple IV lines for continuous infusion therapies. The purpose of this study was to determine physical compatibility for commonly used medications in critically ill patients. Visual and turbidimetric methods were used to assess y-site physical compatibility of esomeprazole, insulin, and electrolyte admixtures. Concentrations used for all admixtures were the maximum concentration appropriate for IV infusion. A turbidity difference of 0.5 nephelometric turbidity units was considered incompatible. Analysis of variance was used to determine

statistical difference between the experimental groups and controls. A p -value less than 0.05 was deemed statistically significant. Most admixtures of insulin and electrolytes demonstrated no evidence of physical incompatibilities. Admixtures of esomeprazole with furosemide, or vasopressin demonstrated no evidence of physical incompatibilities after visual and turbidimetric assessment. Visual disturbances were noted when esomeprazole was combined with diltiazem, dopamine, insulin, nicardipine, nitroglycerin, and vecuronium. The turbidity of admixtures of esomeprazole with diltiazem, nicardipine, nitroglycerin, or vecuronium were also more than 0.5 NTU greater than controls and were statistically different from that of controls. Although less than the 0.5 NTU benchmark, the turbidity of admixtures of esomeprazole/epinephrine, esomeprazole/phenylephrine, and magnesium sulfate/furosemide were statistically different from that of controls. Practice guidelines require a minimum of physical compatibility to co-administer IV medication therapies. Dopamine and insulin demonstrated visual changes when combined with esomeprazole and should not be co-infused. Diltiazem, nicardipine, nitroglycerin, and vecuronium demonstrated visual and turbidimetric physical incompatibility with esomeprazole and therefore should not be co-infused through a y-site. Co-administration of esomeprazole and epinephrine, esomeprazole and phenylephrine, and magnesium sulfate and furosemide is not recommended, due a statistical difference in turbidity between control and experimental groups.

1.61 Age of Marriage

Catherine A. Tarvin

Advisor: Robert H. Freymeyer, Ph.D.

Department of Sociology

Traditionally women in the United States have tended to marry at younger ages than men. Using data from the 2006 General Social Survey the relationship between gender and the age of marriage is explored. I hypothesize women marry earlier than men, with typically women marrying around their early twenties. Additional variables to consider in this research include race and educational level. For some in society today, marriage acts as an economic stabilizer, thus making understanding this relationship important.

1.62 Can Water Fleas Sense Acidity? Evidence for ASIC 3 Expressions in *Daphnia*

Ambreona K. Thomas

Advisor: Sarah M. Sweitzer, Pharm.D.

Department of Pharmaceutical Sciences

Currently, chronic pain is the third greatest health issue behind cancer and heart disease. Despite taking prescribed medication for pain, patients with neuropathic pain continue to have pain of moderate severity, as neuropathic pain results from trauma or damage originated and continued by an offense to the peripheral or central nervous system. Development of pain drugs and translation of new drugs to the human patient population has been slow. ASICs are found in tissues and cells throughout the body and nervous system with particularly high expression in the peripheral nervous system and nociceptors. Nociceptors are receptors for pain, in other words they are how we feel pain. ASICs are an essential component to chronic pain. Because they are found on nociceptors, which are responsible for delivering pain sensation, if research can inhibit the ASICs then one can interfere with the function of the nociceptors. The purpose of this experiment is to develop a high throughput behavioral screening method to identify potential acid-sensitive ion channel (ASIC) channel inhibitors for the treatment of pain. For this experiment, the behavior and reaction of daphnia in varying levels of pH will be observed and compared. A 3-chamber model behavioral system will be used to examine *Daphnia* responses

to changes in pH level. This behavioral characterization of *Daphnia* responses to pH will be paralleled by a genetic screening of the *Daphnia* genome to identify putative ASIC genes. So far the reactions seem to depend on size of the *Daphnia*. The smaller sized *Daphnia* avoid the acid chamber, spend less time, or drastically slow down while the larger *Daphnia* behaves the same in the acid chamber as it does the others. This could possibly suggest that the ASIC3 expression varies with development. If proven to express functioning ASIC channels then *Daphnia* can be used to screen marine extracts for potential ASIC channel inhibitors for the treatment of pain.

1.63 The Effects of Toxoplasma on Driving

Jeanette L. Traver
Advisor: Troy R. Nash, Ph.D.
Department of Biology

Toxoplasma gondii is an intracellular coccidian parasite that infects a wide variety of warm-blooded animals. Humans can be utilized as a dead-end intermediate host by *Toxoplasma*, where the parasite resides in metabolically dormant tissue cysts throughout the individual's life. Studies of *Toxoplasma*-infected humans have shown *Toxoplasma* can lead to several changes in human behavior, such as a decrease in motor performance and fear as well as increase in activity and reaction times. Several studies have indicated that *Toxoplasma*-infected individuals are at an increased risk for traffic accidents due to increased reaction times. In this study volunteers donated a small blood sample through a self-administered finger prick and an ELISA was used to test volunteers' blood for *Toxoplasma* infection. Volunteers also completed a driving history questionnaire to collect data about their driving habits and accident history to determine if *Toxoplasma* infection has any affect on driving performance or accident risk. Some volunteers were selected to participate in a driving simulation to evaluate driving reaction times to visual stimuli. The reactions times of individuals infected with *Toxoplasma* were compared to uninfected individuals to determine if individuals infected with *Toxoplasma* have increased reaction times. This research attempted to identify if a possibility of an increase in reaction time could be the causative agent for an increase risk in driving accidents.

1.64 FGD1 Mutations in Breast Tumors

Danielle F. Van Delden and Laura B. Dajani
Advisor: Christopher L. Farrell, Pharm.D.
Department of Pharmaceutical Sciences

Breast cancer has one of the highest cancer death rates among US women with 40,000 deaths annually. This cancer develops primarily due to somatic mutations that occur in the tumor cells. The FGD1 (FYVE, RhoGEF and PH domain-containing protein 1) gene has been identified as a potential oncogene with several somatic mutations being observed in advanced breast tumors. Using next-generation DNA sequencing, we are examining 46 breast cancer tumors to identify novel mutations in the FGD1 gene. We are performing a copy number analysis using real-time PCR to compare breast tumor with corresponding normal samples. Copy number analysis is being used to identify tumors with more than two copies of the FGD1 gene. We anticipate that the results from the sequencing experiment and the copy number analysis will support the current findings about the FGD1 gene as cancer driver gene for breast cancer development. Mutations identified may present a novel target for developing future specific treatments for breast cancer.

1.65 The Findings and Makings of Common Ground and Peace

Garrett E. Warren
Advisor: Richard R. Heiser, Ph.D.
Department of History

This research seeks to answer the question, "What influenced Queen Elizabeth I to create the Religious Settlement of 1559?" England goes through these religious battles between Protestants and Catholics during the reigns of Edward VI and Mary I. Why does Elizabeth choose religious tolerance, instead of promoting one faith like her siblings? The analysis began with finding a connection between Elizabeth I and Renaissance ideals. Elizabeth I did receive a humanist education, and studied men like Cicero, Erasmus, and other Renaissance figures. There are difficulties with the conclusion, however, in that Mary I and Edward VI also received a humanist education as well. The author seeks to prove that Elizabeth I's Religious Settlement was influenced by outside forces, and not just her humanist influence.

1.66 The Pursuit of Perpetual Peace

Andrew B. Williams
Advisor: Richard R. Heiser, Ph.D.
Department of History

King Henry VII endured many attempts to overtake his crown throughout his reign. The constant threat of Perkin Warbeck, deteriorating relations with France, and problems with securing an heir for the Tudor Dynasty persuaded him to unite with King James IV of Scotland and sign the Treaty of Perpetual Peace in 1497.

1.67 Normal Stages of Osteogenesis of the Avian Hind Limb: A Microscopic Study

Katie R. Wilson
Advisor: James T. Wetzel
Department of Biology

The purpose of this research was to observe through microscopy the developmental patterns of bone formation of the chicken, *Gallus gallus domesticus*, and construct a series of micrographs that depict the process of osteogenesis. The first appearance of the forelimb bud in the chicken embryo at 72 hrs. post-fertilization (an embryo with a 21 day developmental period) parallels the timed appearance of the forelimb bud in the human embryo at 23 days within a 9-month gestational period. As such, avian embryos provide a workable model system for studies of proximo-distal outgrowth of limb, chondrofication and osteogenesis, and functional differentiation of muscle and skin. Documentation of these events was carried out using differential staining of cartilage and bone as well as light and scanning electron microscopy. Fertilized eggs were kept in an incubator until ready to be used to obtain embryos at various developmental stages. Embryos from developmental days 8, 9, 10, 13, 14, and 16 were differentially stained using Alcian Blue to signify cartilage and Alizarin Red S to signify bone. Embryos from developmental hours 250 hr, 278 hr, and 300 hr were dehydrated and then critical point dried in preparation for Scanning Electron Microscopy. Images from the Scanning Electron Microscope were then compared with the photomicrographs in order to confirm osteogenesis on the cellular level. Developmental abnormalities that can occur during limb formation are often the result of 1) improper differentiation of cartilage from mesodermal tissue, or 2) insufficient ossification of the cartilage matrix at the epiphysis of bone. This study can be used as a basis for additional research on limb abnormalities in order to compare normal vs. any abnormal development that

could be affected by environmental variances or pollutants. It was found that osteogenesis began at the proximal epiphysis and diaphysis and occurred later at the distal epiphysis.

1.68 “A Misinformation Campaign”: The Internment of German-Americans during World War II

Kirsten N. Witry
Advisor: Stefan W. Wiecki, Ph.D.
Department of History

Most people know that over 100,000 Japanese-Americans were interned in the United States during World War II. Fewer know that Executive Order 9066 also meant internment for thousands of German- and Italian-Americans. The United States government denied that the internment of German-Americans even happened for many years. It is time for this part of American history to become better known. This is a stand that German-American historians have taken for many years, but few, if any, have looked at why this is not a well-known topic. This research seeks to explain why German-American internment is an American secret, as well as argue that it is time for it to become public knowledge.

1.69 The True Green Project

Ethan R. Woodard
Advisor: Chad L. Rodekahr, Ph.D.
Department of Physics

With increasing global concerns for the environment, many home and business owners are moving towards “green” or environmentally friendly alternatives to their energy needs. A problem occurs when home and business owners try to implement their desired green alternatives and realize that the switch can demand a high financial cost to the user or the “green” alternative does not remedy the users environmental concerns. The goal of The True Green Project is to determine the financial costs and environmental impacts of various green alternatives and give end users the tools they need to determine the financial and environmental effectiveness of these technologies, in order to ultimately choose the best options.

1.70 D-Day: The Changing U.S. Soldiers’ Experience

James G. Yarbrough
Advisor: Stefan W. Wiecki, Ph.D.
Department of History

This research examines how American soldiers experienced the D-Day invasion of continental Europe in 1944. By analyzing movies and firsthand accounts, the author will show how the experience of soldiers changed over time and why the change occurred.

2 Department of Music Honors Students

James T. Brannon, <i>Guitar</i>	Elizabeth Anne Derrick, <i>Voice</i>
Joshua R. Harrington, <i>Organ</i>	Cassidy M. Jarrett, <i>Percussion</i>
Jo A. McAnally, <i>Voice</i>	Tyler P. McDaniel, <i>Trumpet</i>
B. Abigail Sease, <i>French Horn</i>	Tianna M. Smith, <i>Voice</i>
Zachary W. Wells, <i>Voice</i>	