

HONORS DAY SYMPOSIUM

PRESBYTERIAN COLLEGE
APRIL 23, 2020



April 23, 2020

Dear Faculty, Students, and Guests,

Honors Day at PC recognizes your achievements and allows you to share and celebrate your work. It is especially important and unique this year.

It would be an understatement to say that this has been an unusual semester. While we are all navigating uncharted waters, you have set an example that serves to inspire all of us. The resilience and perseverance you have exhibited in pursuing academic excellence demonstrates your ability to adapt and move forward in the midst of unprecedented circumstances. We congratulate you on your accomplishments.

The Promise of PC is our strategic plan to help students achieve their full potential in today's world. What better time to see the Promise of PC in action than on Honors Day, a day devoted to academics and student success?

The writing assignments, presentations, and research that students work so hard on show us how well we are accomplishing the mission of Presbyterian College. I'm proud of the standard of excellence put on display in the honors work that our students complete under the guidance of faculty mentors.

Honors Day is a time to celebrate our students' achievements. It's also an inspirational day of creativity and research. I hope each of you will join me in listening to our students present their work.

Congratulations to those who are presenting during Honors Day, those who are receiving awards, and those who have mentored them along the way. Each of you is a great example of what it means to be a Blue Hose.

Although we won't be gathering in person on campus today to celebrate and recognize you and your work, we will celebrate virtually with you from places all around the country. To all, I extend, on behalf of the Faculty of Presbyterian College, a hearty welcome to Honors Day 2020.

Sincerely Yours,

A handwritten signature in black ink that reads "Bob Staton".

Bob Staton '68
President



April 23, 2020

Members of the PC Family,

Culmination. Creativity. Commitment. Three words that start with C reflect what you see in the 2020 Honors Day Symposium, which I am pleased is being presented virtually for the first time. Although circumstances prevent us from conducting these events in person, I am impressed and excited by the commitment and creativity the students presenting today are demonstrating in sixty different presentations, posters, performances, and programs that serve as culminating experiences for their time at PC. To move from the physical setting to a virtual environment presents a unique set of challenges, on top of all the hard work in process to finalize papers, complete projects, and develop the presentations themselves. The students you will see present today have done an amazing job in rising to this challenge, and in a very meaningful way they are enhancing their academic abilities and demonstrating their drive to succeed in their various pursuits. Students, congratulations – well done to all of you!

I also want to recognize the incredible work and dedication of our faculty, who are serving as mentors, advisors, and moderators for the symposium. It speaks volumes to the commitment of our faculty to the student experience that we have over twenty panels, posters, programs, and presentations to coordinate in the virtual symposium, and they have done a terrific job in managing the changes involved as well in working with our students so they present their best work. I want to particularly recognize Dr. Stefan Wiecki, Professor of History, for his tireless efforts and outstanding leadership in making this 2020 Honors Day Symposium a reality for each of the students whose work is highlighted in this booklet of abstracts.

I hope each of you enjoys the 2020 Honors Day Symposium, and students again you have done exceptional work – we are all proud of you!

Sincerely,

A handwritten signature in black ink that reads 'Donald R. Raber II'. The signature is fluid and cursive, with a large, stylized 'D' at the beginning.

Donald R. Raber II, Ph.D.
Provost

In silico Investigation of the Mechanism of Transmembrane Transfer of Cholesterol by NPC1

Shelby M. Baker

Marharyta G. Petukh, Ph.D.

Department of Biology

NPC1 is a large transmembrane multidomain protein located in the lysosomes and late endosomes which is responsible for cholesterol (CLR) transfer from vesicles to the endoplasmic reticulum and other cellular compartments. Any change in the protein activity, i.e. due to mutations, can cause Niemann-Pick type C disease associated with failure of CLR delivery to the appropriate cellular compartments in humans. Previously, it was suggested that the sterol sensing domain (SSD), transmembrane helices 3-7 of NPC1, can be involved in CLR transfer through the membrane by forming a pore. Here, we tested this hypothesis by applying evolutionary and *in silico* analysis to study the structural and functional activity of SSD. With steered molecular dynamic simulations, we found that CLR indeed can be transferred through SSD. The free motion of CLR is limited only by establishing transient specific interactions between the ligand and the residues of the protein. We detected the only possible path of CLR transferred through the pore that was aligned with highly conserved residues. The substitution of one of these residues (D771A) reduced the protein stability by affecting the number of specific interactions within SSD and significantly deviated CLR passage through the membrane compared to the wild type protein.

Analyzing the Relationship Between Aluminum Exposure, Reactive Oxygen Species Production, and Iron Dyshomeostasis in *Saccharomyces cerevisiae*

Tannor A. Byrd

Evelyn J. Swain, Ph.D.

Department of Chemistry & Biochemistry

Saccharomyces cerevisiae is a popular model for mammalian metabolic pathways. A countless number of these pathways are conserved. The objective of this study is to analyze the relationship between aluminum exposure, reactive oxygen species (ROS) production, and iron dyshomeostasis in *Saccharomyces cerevisiae*. Friedrich's ataxia is a genetic neurodegenerative disease directly correlated with iron dyshomeostasis. *Saccharomyces cerevisiae* can be used to model this disease through deletion of the YFH1 gene. This gene codes for the YFH1 protein that plays a crucial role in the formation of iron-sulfur clusters. While the pathways of *Saccharomyces cerevisiae* and mammals are slightly different, research using yeast models could result in new treatment options for this mammalian disease. The study will be performed using two strains of *Saccharomyces cerevisiae*. The wild type strain will demonstrate normal iron homeostasis function while the YFH1 strain will model iron homeostasis in a Friedrich's ataxia patient. The viability of the two strains will be calculated after varying aluminum ion concentrations and exposure times. The potential significances include confirming the impact of aluminum exposure on iron homeostasis via reactive oxygen species and making advancements in treatment methods for individuals suffering from Friedrich's ataxia.

“The New World of Medicine”: Syncretism between Spanish and Indigenous Medical Practices in the Colonial Era of Latin America

Alexis K. Clark

Jaclyn A. Sumner, Ph.D.

Department of History

Contemporary accounts from the time of contact between the Spanish and indigenous people of the “New World” tended to portray the indigenous people as barbaric savages. Included in this was the misrepresentation of indigenous medical practices, which the Spanish claimed to see as heretical and unscientific. However, historical and archaeological evidence runs contrary to the assertion that indigenous medicine was unintellectual and of little use, as the Spanish readily adopted medical practices of indigenous origin in both the “New World” and the “Old”. While much of the syncretism that occurred between indigenous and Spanish medical practices can be difficult to trace and ascribe origins to, herbal remedies represent an exception to this, as plants native only to the “New World” likely had indigenous origins and are far more easily traceable. With the analyses provided by this research paper, I hope to prove that indigenous medical knowledge was of great value to, and had a large effect on, the medical discourse of the Colonial New World and Spain because of centuries of indigenous development with access to resources unique to the New World prior to European contact.

Assessing the Soil Microbiome Surrounding *Quercus alba* as a Possible Cause for Inconsistent Tree Growth Patterns in Relation to the PDSI

Adrianna L. Cody

Michael O. Rischbieter, Ph.D.

Department of Biology

White oak (*Quercus alba*) is one of the most commonly studied tree species in dendroclimatic research due to the consistent growth signal it produces in response to changing climatic conditions. Recent studies of white oak in the upstate of South Carolina has shown, however, that this correlation is not always as consistent as reported in the literature. In some cases, low or negative PDSI (indicating low moisture, or more severe drought conditions) has resulted in statistically higher tree growth rates. The purpose of this study was to analyze the soil microbiome from three different environments to determine the possible contribution of beneficial soil bacteria to high white oak ring growth rates during drought conditions indicated by the Palmer Drought Severity Index. This analysis used 16S rRNA sequencing from soil samples taken from three different microenvironments near Clinton, South Carolina, to determine the bacterial components from each location. The results showed significant differences in bacterial diversity between the locations sampled. An analysis of the bacterial populations that differ between the sites has revealed a possible link between the soil microbiome and higher than expected growth rates in white oak during elevated drought conditions.

A Study on Solar Wind Bulk Flow Velocity and the DST Index Pertaining to the Human Physiology

Briana L. Cody

James A. Wanliss, Ph.D.

Department of Physics & Computer Science

The sun influences all life on our planet and therefore claims an amount of curiosity. This curiosity has led many people to find ways to study and explore the vast expanse above us. Because of increased human activity in space, it is important to determine the risks on the human body when subjected to the changing phenomenon that is the solar wind. With this research, we propose that among the aspects of the solar wind, there is a correlation between solar wind bulk flow velocity and the DST index (magnetic field fluctuation) surrounding Earth. We demonstrate the relation between these two variables, and with this information determine if there is evidence of an effect on the human physiology due to the changes in these indicators.

A Woman's Significance in Society: How and Why Did Society's Perceptions of Women Change from the Aztec Empire to Spanish Rule in Colonial Mexico?

Serina Combs

Jaclyn A. Sumner, Ph.D.

Department of History

Women who lived prior to and following the Spanish conquest of the Aztec Empire played integral roles in the functioning of each respective society. In the Aztec Empire, women were known for their weaving ability that enabled the Aztec economy to flourish and prosper, while women in colonial Mexico played an important role in the Catholic Church by becoming nuns and educating the youth. Even with their unique abilities, Aztec and colonial Mexican women were far undervalued for their contributions to society by men, and comparatively, women in colonial Mexico received worse treatment compared to their Aztec counterparts. This paper examines why the Aztec and colonial Mexican societies did not value women as much as they valued men, analyzes what institutions were in place in each society that led to the inferiority of women, and uncovers why the Aztecs placed more of an emphasis on women than the Spanish of colonial Mexico.

A Republic of Missions: The Reality of Jesuit Missions among the Guaraní Tribe of Brazil and Paraguay

Jahnnie L. Conner

Jaclyn A. Sumner, Ph.D.

Department of History

The Society of Jesus, born amid religious strife of the Enlightenment, was founded in 1540 to combat the spread of Protestantism throughout the world. The Jesuits, members of the order, were called to gather converts from indigenous tribes of South America. The Jesuits encountered the indigenous Guaraní tribe when they entered Brazil and Paraguay. The Jesuits were successful in befriending the Guaraní and found them suitable to become their converts. The Jesuits established missions, small towns that allowed for maximum conversion, throughout Brazil and Paraguay. This research will discuss how the colonizers of Spain and Portugal enslaved the Guaraní of Brazil and Paraguay; they did not influence the Guaraní culturally nearly to the degree that the Jesuit missions did. The Jesuit missions left an impact through religious conversion, economic systems, and lasting cultural institutions among the Guaraní tribe that is still present in modern times. In spite of the Jesuits believing that the missions were God's divine plan, the Jesuits demolished the Guaraní culture and prevented it from being restored to its former state.

Gender Expectations in Colonial Latin America and How Women Set Out to Challenge the Norm

Thomas Z. Davis

Jaclyn A. Sumner, Ph.D.

Department of History

The male role in factors such as education, the church, gender expectations, and masculinity versus femininity clearly indicate that men dominated Latin America. This research examines the starkly different societal expectations between men and women. Men were educated, held high positions in society, and were basically free to do whatever they pleased with no consequences, while women were only educated if they were in convents, which their fathers placed them in, or they were women who got viewed as prostitutes. Since women were never allowed to voice their opinions in the political decisions and government systems, it automatically placed them at a disadvantage because they had no say in society's laws. The educational imbalance between the two genders ties directly into the disadvantages women faced in Latin America, suggesting if women would have been educated, then a foundation could have been established allowing them to argue against the men in political power which could have changed the general male domination into a more equal society. With support from numerous primary and secondary sources, the argument will be presented that women could have achieved the same rights as men if factors like education would have been available to them.

Deciphering the Other in Cold-War Era American Film

Matthew K. Davis

J. Justin Brent, Ph.D.

Department of English

Beginning in the era following the end of World War II through the years following the end of the Vietnam War, there was a major shift in the American psyche regarding the desire to understand people and forces outside of their own borders or realm of understanding, who will be called “the Other” for the purposes of this research. This research and presentation examine this evolution through analyzing Truman Capote’s, *In Cold Blood*, and cross-examining its narrative arc and intent with several films across the time frame in question. Such films for this research include Don Siegel’s, *Invasion of the Body Snatchers*, Stanley Kubrick’s, *Doctor Strangelove*, and Oliver Stone’s, *Platoon*. Together, they help show the growing complexity of the Other’s depiction in cinema.

Norman Mailer's *The Armies of the Night*: New Tools for the Trade

Denise K. Devaney

J. Justin Brent, Ph.D.

Department of English

Norman Mailer writes his novel, *The Armies of the Night*, in the third person and incorporates himself into the novel as a witness to the events that occurred, especially the March on the Pentagon. He incorporates subjectivity into the work, a tool historical and journalistic accounts avoid in all of their stories. Mailer uses his subjectivity and experience as a way to solidify his recall on the March on the Pentagon and gives readers a deeper understanding of the march that historical and journalistic accounts could never provide. He expands the new journalists' tools with his allegories, metaphors, and his own character development. Mailer analyzes all points of view and the different accounts of the March on the Pentagon and argues that his point of view is essential in telling the story of the event along with the journalistic and historical accounts. He also doesn't show a significant stand in politics by disassociating himself further from an affiliation, calling himself a left conservatist. He also wants to question all political stances and arguments before finally agreeing and believing in it as a fact. With Mailer's critical scope and expand on literary tools in new journalism, he sets a higher standard for other new journalistic writers.

Michael Herr, Tim O'Brien and the Vietnam War

Brandon Elledge

J. Justin Brent, Ph.D

Department of English

Michael Herr and Tim O'Brien are two of the most famous names associated with Vietnam War literature. Both authors approach the war from different perspectives: Herr was a wartime correspondent during the conflict, O'Brien was a veteran who had actively served. Together, their works, such as Herr's, *Dispatches*, and O'Brien's, *The Things They Carried*, have had a significant impact on the way Americans view the Vietnam War. This research paper examines the impact both authors had, amidst the many other postwar writers, in shaping the general American retrospective view of the Vietnam War. Some of the important questions that will be considered are as follows: What individual techniques did Herr and O'Brien use in writing their literature? How are both writers similar and different? In what ways have they shaped America's view of the Vietnam conflict? All in all, the purpose of this paper is to single out two of Vietnam War literature's most famous authors and to measure their influence in painting the postwar image of the tragic conflict.

Graphical Analysis of the Rope Braiding Process

Harrison H. Fisher

Chad L. Rodekohr, Ph.D.

Department of Physics & Computer Science

The rope braiding process consists of multiple dynamic factors which, when changed, affect the characteristics of the completed rope dramatically. Because of its complexity, there exists no mathematical model sufficient to adequately describe the process. As a result, making rope with the desired specifications is more of an art than a science. Time and money are wasted because there is no accurate predictive model for a desired outcome. The overarching goal of this research is to develop a mathematical model of the rope braiding process in order to accurately predict the characteristics of the rope based on the settings of a braiding machine. A braiding machine is being built here at Presbyterian College to achieve this goal. This semester, finishing touches were being made to the braiding machine in order to make it fully operational, while three-dimensional computer models of the rope system at several points in time were developed and analyzed in order to better understand the process.

Consequences of Ours

Sarah E. Gastright

Robert E. Stutts, M.F.A.

Department of English

Consequences of Ours is the beginning of a novel working to show the repercussions not typically shown in a YA fantasy novel, including the aftermath of revolution and follow through of trauma. *Consequences* follows the protagonists of Jake, who struggles with PTSD and anxiety, and his girlfriend, Ana, who struggles with her role in her family, two shapeshifters who attempt to forge a place where they can be welcomed after being rejected by their hometown while attempting to get justice for victims of systemic abuse. Through an exploration of history, psychology, and sociology, the goal is to put on trial the tropes of YA novels and express how nothing is quite as simply resolved with a “happily ever after” as some might think it to be.

Embryogenesis in the Live-bearing Fish, *Poecilia latipinna*: a Correlative Microscopy Study

Corinne E. Gillion

James T. Wetzel, Ph.D.

Department of Biology

Compared to egg-laying (oviparous) fishes, viviparous species are internal brooders and give birth to fully formed young. In viviparous species, such as *Poecilia latipinna* (mollies), nutrients are supplied throughout gestation by materials secreted into the female brood pouch and absorbed by the developing young - functioning as a placental analog. Accordingly, (and different from oviparous species) the gut is functional prior to parturition. As such, these fish can potentially be used as a model organism to study maternal-fetal metabolic relations throughout embryology. Embryonic stages of the medaka, *Oryzias latipes*, have been studied and a series of micrographs of their normal stages of development has been created. No such series of images exist for viviparous fishes. Through induced breeding and correlative microscopy, we generated a series of seven normal developmental stages of mollies from fertilization to parturition against which we can measure abnormalities in morphology. We also used correlative microscopy techniques to study the absorption pattern of iron in mollies and determined that mollies have regional absorption of iron. As we continue this research, we will use mollies to study maternal transport of other nutrients such as carbohydrates and protein. These results will allow us to validate our hypothesis that *Poecilia* has regional absorption of nutrients in their gut and, therefore, can be used as a model organism to study maternal-fetal transport.

Affective Prosody Perception in Typically-Developing College Students

Madyson P. Glenn

Kate Anderson, Ph.D.

Department of Psychology

Effective verbal communication relies on the ability to recognize emotion in tone of voice, known as affective prosody perception. Affective prosody can be assessed using a Vocal Emotion Recognition (VER) task, in which participants identify which emotion is portrayed in auditory speech stimuli. A recent application of the VER task has been the study of affective prosody in Autism-Spectrum Disorder (ASD). ASD is a neurodevelopmental disorder characterized by the DSM-5 as involving restricted and fixated interests and social communication impairments (American Psychiatric Association, 2013), though everyone in the general population exhibits some levels of ASD symptoms. The degree to which typically-developing individuals exhibit autistic tendencies can be measured using the Autism-Spectrum Quotient (AQ) (Baron-Cohen et al., 2001). The first aim of the current study assessed the relationship between VER performance and AQ scores, for which no significant correlation was found. The second aim was to determine if VER performance changes when background noise ("babble") is present. Performance with no background babble was marginally significantly lower than performance with background babble. Based on our results, the presence of background noise may influence the ability to detect emotional tone correctly for individuals with higher levels of ASD symptoms.

Religion Rebranded: How Maya Religion Persisted with the Arrival and Increased Influence of Catholicism

Hyland C. Gonzalez

Jaclyn A. Sumner, Ph.D.

Department of History

Despite the general assumption in literature on the Spanish conquest that the military conquest of the New World also resulted in cultural conquest, Maya religion persisted. Through evidence of surviving religious practices and documents, I will show how Maya religion endured because of resistance through Catholicism and practicing in secret. In many cases, this led to Maya religious syncretism, the combined practice of Maya and Catholic religions through merging worship. This presentation will discuss how the Maya maintained their religious beliefs through syncretism after the Spanish arrival, focusing on colonial times and bringing the discussion to the present day. The historiography will highlight historical contributors alongside anthropologists. Discussion of resistance begins with the attempts at conversion, the role of inquisitions, and *cofradías*, or saint cults. Religious roles expanded for women, fostering syncretism through pre-Columbian rituals and addition of Catholic practices. Syncretism was documented in the *Chilam Balam*s: collections of rituals, histories, and other sources that span from Christianity's introduction into postcolonial times. After independence, syncretism continued past the Caste War and into the present day, observed in the persistence of "Costumbre" religion, revival of *cofradías*, and use of idols. Ultimately, the evidence of surviving rituals and documents supports the argument that Maya religion endured through resistance by syncretism.

The Role of IL32 in Metastatic Breast Cancers

Emma V. Gray

Austin Y. Shull, Ph.D.

Department of Biology

Metastatic basal-like breast cancers typically correspond with increased enrichment of cancer stem cells (CSC) as well as tumor inflammation and immunoediting phenotypes. However, the interplay between these two is not well understood. To find the connection between CSCs, inflammation, and metastasis, we compared 450K DNA methylation profiles of CSC-poor cell lines to CSC-enriched breast cell lines and found differential methylation within the promoters of several immune-related genes. Specifically, the IL32 promoter was found to be hypomethylated in CSC-enriched cell lines and corresponded with increased expression of the beta isoform transcript of IL32. This correlation between IL32 methylation and expression mirrored The Cancer Genome Atlas breast cancer dataset. Gene Set Enrichment Analysis found that NF-kappaB inflammatory pathway transcripts were most correlated with IL32 expression. Furthermore, publicly available H3K27 and BRD4 ChIPseq data revealed that the IL32 promoter in the basal-like breast cancer cell line SUM159PT had high levels of H3K27 acetylation and high BRD4 recruitment. These results corresponded with an experiment utilizing SUM159PT cells and chick chorioallantoic membrane (CAM) xenograft assays where metastasis and tumor size on the CAM decreased after treatment with the BRD4 inhibitor, JQ1. These findings suggest that the inflammatory cytokine IL32 may play a role in inducing inflammatory pathways that drive metastasis in basal-like breast cancers.

One Nation Under God: Religious Affiliation and Congressional Voting Behavior on LGBTQ+ Legislation

Emily J. Green

Erin S. McAdams, Ph.D.

Department of Political Science

While the broader literature on religion and politics has grown exponentially since the 1980s, the literature surrounding religion's impact on Congressional voting behavior has not been as comprehensive. This study seeks to extend previous research by testing the impact of religious affiliation on legislators' behavior on bills related to LGBTQ+ rights, specifically their scores from the Human Rights Campaign and vote choice on the Equality Act. It is expected that, even in a highly polarized climate, religious affiliation is a reliable indicator of roll-call voting on LGBTQ+ issues among legislators from evangelical protestant traditions. Using multivariate linear regression, it is found Baptists are significantly more likely to oppose pro-LGBTQ+ legislation than other religious groups represented in Congress. Furthermore, party identification remains a statistically significant variable for explaining how legislators vote on pro-LGBTQ+ legislation.

Holy Inclusivity: An Analysis on Judaized East Jerusalem and Presbyterian Church (U.S.A.) Social Witness Policy

Emily J. Green

Kirk J. Nolan, Ph.D.

Department of Religion & Philosophy

This research seeks to understand how East Jerusalem has been Judaized to further Israeli interests since the Oslo Accords of 1993, and determine how the Presbyterian Church (USA) should respond through Social Witness Policy. To understand why Jerusalem as a whole now mimics a “divided-city” rather than a diverse community of faith, three areas are explored through qualitative research: (1) the progression of Israeli settlements in East Jerusalem during the past three decades, (2) United Nations resolutions and International Court of Justice rulings directed toward the Israeli Palestinian conflict, and (3) Presbyterian Church (USA) official statements and overtures pertinent to the status of Jerusalem. Data is collected through academic journals, print books, organizational websites, and elite interviews. This research combines church polity and current events to create new PCUSA Social Witness Policy. The long-term intention of this research is for the Presbyterian Church (USA) to implement the policies outlined in the conclusion.

The Sabra and Shatila Massacre: Where the Guilty, Israel, the Phalangist, and the United States are Vindicated and the Victims, the Palestinian People, Prevail Against All Odds

Riley E. Hemm

Roy B. Campbell, Ph.D.

Department of History

On September 16, 1982, a Christian Lebanese militia known as the Phalangist invaded the Palestinian refugee camp of Shatila and the adjacent district of Sabra in Beirut, Lebanon. Over the next day and a half, they massacred 3,500 Palestinian and Lebanese civilians mostly women, children and the elderly. This massacre shocked the world due to the extreme levels of cruelty committed against the victims and is considered one of the worst atrocities in modern Middle Eastern history. However, minimal action has been taken to persecute the guilty. This research is designed to identify the responsible and explore why justice has not been served. It will reveal that Israel, the Phalangist, and the United States all proved to be complicit in the Sabra and Shatila massacre. While the evidence is most damning against the Israeli government, they did not act alone. However, none of these parties have been held responsible because the victims, the Palestinian people, have been a historically marginalized group. As a result of their perceived inferiority, no legitimate legal body has done what is necessary to obtain justice.

The Study of Sphingolipids Metabolism and its Effect on Neurological Disorders

Ricardo Hernandez

Evelyn J. Swain, Ph.D.

Department of Chemistry and Biochemistry

Marharyta G. Petukh, Ph.D.

Department of Biology

Sphingolipids are molecules involved in important processes like cell growth, signaling, and apoptosis. Sphingolipid metabolism is involved in the proper development of the brain, and dysregulation of sphingolipid homeostasis leads to sphingolipidoses disorders such as Niemann Pick's disease and Gaucher's disease. Sphingolipids also play a role in the proper development and functioning of mitochondria. In this research, sphingolipid metabolism and its effect on mitochondrial functioning are studied. The cells are stressed by removing nitrogen from the media. An adaptive mechanism to these conditions is the increase of mitochondrial functioning that prevents the formation of reactive oxygen species (ROS). In our experimental research, we have shown that the CSG2 deletion mutant, that accumulates inositolphosphoryl ceramide (IPC), cannot survive nitrogen starvation conditions in the presence of glucose due to an increase in ROS. Two other sphingolipid mutants were studied: ISC1 delete, which cannot catabolize complex sphingolipids; and IPT1 delete, which prevents the formation of the last complex sphingolipid mannose-(inositol-P)2-ceramide (M(IP)2C). Bioinformatics tools enabled us to characterize ISC1 and its human homolog sphingomyelin phosphodiesterase 2. An evolutionary and structural analysis of both proteins were performed. Using these tools, it was shown Isc1p binds IPC differently than the other two mannosylated sphingolipids.

The Alternative Minimum Tax and its Impact on the Middle Class

Richard R. Hightower III

Karen Mattison, M.Acc.

Department of Economics & Business Administration

In 1969, the Alternative Minimum Tax (AMT) was created to prevent wealthy taxpayers from using loopholes that enabled them to pay little or no United States federal income tax. For many years, the alternative minimum tax primarily affected upper class income taxpayers, but in recent years, the tax has trickled down to the middle class. This paper will look at the effect of the exemption amounts, recent tax legislation, and inflation, and focus on how these items have resulted in a deviation from the original intent of the tax.

Exploitation of Wealth at the Hands of European Colonial Expansion

Leason G. Horne

Jaclyn A. Sumner, Ph.D.

Department of History

European colonial expansion across the Atlantic Ocean into the Americas is often highlighted as the most monumental and controversial topic that contemporary historians desire to fully understand. The Spanish empire is most often discussed in this expansion into the Americas because of the questionable actions carried out by the Conquistador, Hernán Cortés. When Cortés and his men descended upon Mexico in 1519, their judgement of the native culture was clouded by their Eurocentric view of how society should be, as well as their desire for gold and silver. The Spanish's desire was fueled by their deeply rooted Christian beliefs and the pursuit for wealth, power, and glory to the crown. In the historical literature, many important aspects about the native civilizations were often overlooked by the Europeans because of the Spanish's desire to attain wealth from the region. Many contemporary historians challenge the Eurocentric narrative by comparing Spanish accounts to native accounts. Comparing these accounts is the only way to truly understand why the Aztec Empire fell in 1521.

Artistic Expressions of National Pride: A Look into Landscape Paintings in the 19th Century

Haley C. Hughes

Laura Crary, Ph.D.

Department of Art

Throughout time, art has been used as a tool to ignite revolutions, express and spread religious beliefs, show support of political causes, and bring to light social injustices. In the nineteenth century, in parts of Europe and America, the love for one's nation began to be expressed through a rare type of work: the landscape painting. These paintings used images of authentic and natural locations to express that the love for one's country starts at the purest level: its environment. As the popularity of nationalism grew, so did the abundance of landscape paintings. Artists from across the world, began to use this underappreciated use of imagery to manifest this idea of pride of one's nation. In this presentation, I focused on locations where nationalism was abundantly exemplified through the use of landscape paintings and chose to highlight artwork I personally found to have a beautiful way of portraying this symbolic meaning.

The Effect of Word Length on the Serial Position Effect

Megan A. Jones and Brooke Stephenson

Sarah C. Burns, Ph.D.

Department of Psychology

The Serial Position Effect (Murdoch, 1962) describes the tendency to best recall words at the beginning and end of a list, compared to words presented in the middle of a list. The Word Length Effect (Baddeley, Lewis, & Vallar, 1984) describes that lists of shorter words lead to better recall than lists of longer words. This phenomenon is attributed to the capacity of the phonological loop in working memory. In this experiment, we will use three-word lists: one-syllable, two-syllable, and three-syllable words. The word lists have been yoked by subject matter so that each word list contains exactly the same variety of topics. Using the same method as Murdoch, we will read each word list aloud and then prompt the participants to recall as many words as they can. We hypothesize that we will find evidence of the serial position effect in all three conditions but to varying degrees. We think that the list with the shortest words will produce the deepest serial position curve, with a stark contrast to the middle words on the list, and the best recall in the primacy and recency portions of the curve. We think that the list with the longest words will have the shallowest serial position curve, with the least difference between primacy, recency, and middle words.

Do Americans Judge Elected Female Politicians According to Traditional Gender Stereotypes?

Shannon E. Kimbrough

Erin S. McAdams, Ph.D.

Department of Political Science

This Honors Research project examines whether Americans' perceptions of male and female public officials are based on traditional gender stereotypes or not. Although there has been a significant amount of research done on how stereotypes affect women's campaigns while running for office, little has been done on perceptions of women once they have been elected into office. Data for this project was collected from a survey conducted by Pew Research Center from June to July of 2018. Questions were asked regarding Americans' perceptions of male and female politicians' personality traits, leadership styles, and demographic information. Factors about voters that were analyzed include: sex, party identification, and whether someone considers themselves to be a born-again Christian or not. The analysis shows that the majority of Americans, regardless of sex, party, or religious affiliation, answered that they think there is no difference in the traits and leadership styles of male and female politicians. However, the results also show that the percentages of people who voiced their opinions in the survey in favor of one sex versus the other do indicate some signs of being influenced by certain gender stereotypes.

Bookmovies and the Convergence of Novels and Film

Shannon E. Kimbrough

J. Justin Brent, Ph.D.

Department of English

“Bookmovies” are written about real events but use literary devices that can be easily translated to the screen. This writing style puts heavy emphasis on cinematic touches, like including very descriptive settings, which can help film directors create the background and scenery for the films more easily. By analyzing Truman Capote’s, *In Cold Blood*, and Jack Kerouac’s, *On the Road*, this project argues that road-trip novels paved the way for the modern bookmovie. In the process, they brought the world of nonfiction and film much closer together, thereby changing the trajectory of American film.

A Strategy for De Novo Assembly of a Bacterial Genome Using Open-Source Software

Kobie J. Kirven

Stuart G. Gordon, Ph.D.

Department of Biology

The recent development of next-generation sequencing (NGS) has drastically decreased the price of sequencing, but NGS reads are shorter than traditional Sanger reads and thus present more difficult computational challenges for assembly. Assembly of NGS reads involves the use of computational methods to connect sequenced reads into contiguous sequences known as contigs. The assembly of genomic sequences without a reference genome, known as de novo assembly, is even more difficult due to the lack of a genome on which new sequences can be mapped. While many tools exist for each stage in the assembly process, a strategy using open source tools that is optimized for de novo assembly of bacterial genomes has not been optimized. The goal of this study was to develop a strategy of open source tools optimized for the de novo assembly of bacterial genomes.

Taxonomic Influence of Iron in Zebrafish Microbiome

Janetta Kitchko

Stuart G. Gordon, Ph.D.

Department of Biology

The microbiome is important to the health of a host because it supports many physiological functions. It aids in digestion of food, supports immune function, and drives metabolic processes. Iron is an essential mineral that is highly conserved, evolutionarily significant, and an important component of hemoglobin, which transports oxygen in most vertebrates. Zebrafish are freshwater teleosts and are an important model organism. This experiment examined the influence of elevated iron levels on the gut microbiome composition in zebrafish (*Danio rerio*). We hypothesized that since iron is a growth limiting factor for most microbes, the introduction of higher dosages of dietary iron should affect the taxonomic composition of the microbiome in the zebrafish. We sequenced 16S ribosomal RNA amplicons from the gut contents of zebrafish fed differing levels of iron. The sequences were analyzed using QIIME software to examine the effects of iron on taxonomic composition on the zebrafish gut microbiome. In the initial reading of the zebrafish, we found microorganisms from four different phyla. After the experiment, there were eight different phyla, supporting diversity in taxonomic composition. The research compares different microorganisms found after an initial and experimental reading of the microbiome, demonstrating that elevated iron levels contribute to variety in the microbiome.

Eso que no puede ser censurado: el humor durante el franquismo (1939-76)

Alyssa C. Leaman

Sharon E. Knight, Ph.D.

Department of Modern Foreign Languages

El humor es una estrategia retórica compleja porque cuando se cuenta una broma de una manera directa, o se explica por qué una imagen es graciosa, se pierde el efecto cómico o satírico. Es decir, el acto de explicar chistes o tiras cómicas los hacen menos graciosos. Durante episodios de agitación política, el uso del humor es, a la vez, una forma de sobrevivir la situación política y entender los sentimientos de la gente durante el episodio, incluso en lugares donde haya censura de los medios de comunicación. Una colección de frases o imágenes se vuelve graciosa como resultado de la yuxtaposición o la exageración de la ira y el miedo o la hostilidad y la autodefensa. El contexto histórico y la perspectiva del autor son clave para entender bien la broma. Además, el oyente tiene que ser parte de la cultura en la que se creó la broma para que la entienda. Como recurso retórico, el humor puede utilizarse como una diversión en los ratos libres, para explicar una verdad universal o para ayudar a una sociedad a superar una censura de la prensa. En el tercer caso, las bromas son un escape temporal de la restricción omnipresente y severa de la libertad de expresión (Brandes 331). Desde el final de la Guerra Civil Española en 1939 hasta la muerte de Franco en 1976, los españoles expresaron su desdén y su frustración con su situación política y evitaron la censura por el humor.

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That Which Cannot be Censored: Humor During the Dictatorial Regime of Generalissimo Francisco Franco (1939-76)

Franklin B. Long

Dr. Justin E. Lance, Ph.D.

Department of Political Science

Humor, when used as a rhetorical strategy, can be difficult to define. When a joke is retold for clarity, or the components of an image are explained, the comedic or satirical effect of the joke are lost. That is to say, the act of explaining jokes makes them less funny. A collection of phrases or images becomes funny as a result of the exaggeration of anger and fear or hostility and self-defense. Historical context coupled with the author's perspective are key to understanding a joke. To fully understand the context and the comedic value of a joke, the audience must belong to the culture in which the joke was created. As a rhetorical device in media platforms, humor can be used to entertain or to instruct. In situations of societal stress, humor can serve as a temporary escape from the restriction of a society's freedom of expression (Brandes 331). During episodes of political turmoil, humor is not only a way to help people endure a difficult political situation but also serves as a means to begin to understand the feelings of people who lived during the time, even in places where media were censored. In the years following the Spanish Civil War until the death of Franco, Spaniards circumvented the censorship of the time using various forms and themes of humor to express their disdain and frustration for their political situation.

Estimating in Design-Bid-Build Project Delivery

Alyssa C. Leaman

Chad L. Rodekohr, Ph.D.

Department of Physics & Computer Science

Before construction can begin on any project, a general contractor must first win the bid from the owner on the project. A bid consists of all of the material and labor expenses, as well as a timeline for construction. On an average sized project, there may be as many as ten general contractors initially competing for the same project, so it is important to make sure the bid is competitive, as well as accurate. For my project, I have created bids to win jobs for the contractor on bid day using architectural, civil, structural, electrical, mechanical and plumbing plans provided by the architect. These are used to determine quantities of materials required for the project and to aid in communicating with subcontractors that are interested in bidding on the project. I coordinate with subcontractors to obtain sub-bids and ensure their pricing is accurate for the scope of work. As a general contractor, we compile our service cost along with the subcontractor's cost and present our final estimate that offers the greatest value for the lowest cost to the owner on bid day. All of this is then compiled into the final estimate and presented to the client in hopes of winning the bid and getting to proceed with construction.

Feminist Art History: A Portrait of Strong Women Throughout Time

Sammy Jo Lee

Laura Crary, Ph.D.

Department of Art

The historical backdrop for feminist art and art history has developed over several hundred years by expanding its limits to incorporate better approaches for seeing its subject. On the most essential and noticeable level, it has provoked the rediscovery and reconsideration of the accomplishments of women artists who have been omitted from a predominantly male-dominated art history. Through the work and persistence of earlier artists such as Sofonisba Anguissola, Artemisia Gentileschi, and Angelica Kauffman, more recent ones, such as Frida Kahlo, Hilla Rebay, Judy Chicago, and art historians like Linda Nochlin, used their art and writing to compose their own story in spite of conditions against them. I argue that these women artists established the framework for the feminist art movement in spite of the strict guidelines set on their works of art, and their battle has been one that has reverberated with women from that point forward.

The Media's Portrayal of Murder and its Effect on the Public

Julia E. Marsh

J. Justin Brent, Ph.D.

Department of English

Media platforms such as documentaries, news articles/sources, and novels regularly cover the crime of murder and those who commit it. The popularity of these stories suggests a strange infatuation with both the crime and murderer. I will argue that the infatuation with murder and murderers is due in part to how they are portrayed by the media platforms of documentaries, news articles/sources, and novels. In trying to create an entertaining story, these outlets frequently exaggerate sympathetic and appealing features of the murderers.

New Journalism and the Death of the American Dream

Sarah C. Marshall

J. Justin Brent, Ph.D.

Department of English

Americans are quick to cling to the ideals of life, liberty, and the pursuit of happiness, placing all hope and identity in a mere dream. Unshakeable national faith is constantly uprooted, and cherished ideas are reduced to empty promises, yet Americans still cling to the very dream that betrays them all. The American dream is inspiring and full of promise, but its ideals led to great disappointment; that disappointment begged for a new style of writing, new journalism, a style Joan Didion's, *Slouching Towards Bethlehem*, Truman Capote's, *In Cold Blood*, and Tom Wolfe's, *The Electric Kool-Aid Acid Test*, employ. New journalism, as a blending of traditional journalism, literary devices, and narrative style, proved to be an influential medium for the stories of America's brokenness and deception. America's often disregarded broken identity was made palatable and indispensable through New Journalism's unique union of pure reality with dynamic fantasy.

The Battle of the Nuns: How Nuns Views the Patriarchy in New Spain

Kendall E. McGeorge

Jaclyn A. Sumner, Ph.D.

Department of History

In New Spain, a patriarchal society, nuns followed the rules of the Catholic Church with little question. This study focuses on the impact of three women despite their seemingly minimal role. In an analysis of 20 secondary sources and 10 primary sources, the lives of Sor Juana Inés de la Cruz, Ursula Suarez, and María de San José are compared to see how different life experiences affected perspective on the patriarchy in New Spain. For Sor Juana, convents were a place where she could be an intellectual and maintain her independence. In her convent, she wrote controversial works that questioned patriarchal norms and fought for women's rights to education. Ursula dreamed of becoming a nun, worked to enter into the convent and became a nun. Ursula brought her troublemaker ways into the convent and began to push the limits of women's roles in society at the expense of men. María de San José spent as much time out of the convent as she did within the convent, giving her the opportunity to offer equal perspectives on each part of life in New Spain. By comparing these lives, I came to understand that each nun played an important role in challenging patriarchy in New Spain. Most importantly, I concluded that Sor Juana was not representative of nuns in New Spain, as most were not willing to battle the Church as directly as she did. This study is part of growing research on the role of nuns in New Spain and how these brave women impacted the society of their day.

Interactive Chess

Emily Mitchell & Preston Robinette

Eli Owens, Ph.D.

Department of Physics & Computer Science

Chess is a strategic, two-player board game played by millions of people across the world, giving people the opportunity to connect and bridge the gap between language and social barriers. For beginners, the nuances of the six different piece types is oftentimes harrowing and can dissuade people from trying to learn. In order to help people easily identify pieces and their potential moves, we implemented an Arduino to help facilitate the process. The ultimate goal of our project is to give people the power to pick up a chess piece and see what moves they are able to make. We started by wiring a 3x3 prototype board that has nine inputs and nine outputs, a small-scale version of the sixty-four inputs and sixty-four outputs needed by the final board. Next we addressed the question of whether or not a piece is present. After accomplishing this goal, we extended our focus to the recognition of specific pieces. Lastly, we created Arduino code to identify the paths that each piece can take and reveal these to the player through the LEDs on the chess board. Arduino is the optimal tool to solve the problem because we will be able to use its digital channels to track and analyze the pieces on the board. Our project will not only help beginners navigate the pieces on the board, but it will also extend the game to the masses, especially those who feel that chess is too difficult.

Monet and Manet: Brothers of Impressionism

Caroline S. Moorman

Laura Crary, Ph.D.

Department of Art

In 1874, a group of artists, unified by their independence from the annual Salon, organized an exhibition in Paris that launched a movement they called Impressionism. Among these artists were Édouard Manet and Claude Monet, both considered two of the most influential Impressionist painters. Claude Monet's *Impression, Sunrise*, gave the Impressionist movement its name when a critic named Louis Leroy accused it of being a sketch or "impression," not a finished painting. As times changed, so did artists' interests, and they began searching for new inspirations. *Luncheon on the Grass*, *Olympia*, and *The Execution of Maximilian* gave Édouard Manet the title of 'The Father of Impressionism' and allowed him to challenge the long-established norms of what was to be depicted in art. In comparison, Claude Monet, worked directly from nature and painted works that depicted impressionist subjects and ideas such as *Women in the Garden*, *Westminster Bridge*, *Poppies* and others.

The Women of the Troubles in Northern Ireland: Challenging Traditional Gender Stereotypes and Their Clash with Patriarchal Systems

Sarah B. Myers

Roy B. Campbell, Ph.D.

Department of History

This research explores the roles that women assumed in the conflict of Northern Ireland known as “the Troubles.” The Troubles was a sectarian conflict from 1969 to 1998 between Irish nationalists and British unionists. The conflict stemmed from Catholic discrimination by Protestants in the region and was characterized by guerilla warfare. Some of the main questions this research addresses include: what were the various roles that women fulfilled in the conflict and how did they challenge traditional gender norms? Did women take on more peaceful or violent roles? How did the media address women in the conflict? The research will show that women took on both combative and peaceful roles but are often remembered for their efforts towards peace. A comparison of the experiences of Dolours Price, Mairead Farrell, and Monica McWilliams, who all actively participated in the Troubles, gives insight to the challenges faced by women in the conflict. These women challenged gender norms yet still faced sexism within the patriarchal systems of the time period.

Drug Targets for Colorectal Cancer Cells

Manali Patel & Marianne Vandiver

Christopher L. Farrell, Ph.D.

Department of Pharmaceutical & Administrative Sciences

Colorectal cancer has a 5 year survival rate of 64.4%, but this survival rate is influenced by the cancer stage at the time of diagnosis. Treatment of colorectal cancer consists of surgery as well as chemotherapy. Multi-drug resistance can develop by the manipulation of signaling pathways through prescription drug use which can complicate chemotherapy success rates. Upon treating colorectal cancer cells with an angiotensin medication, losartan, the stated proteins levels were of interest. JAK2 is an important protein that plays a role in cell proliferation, but when JAK2 becomes upregulated it could lead to the progression of cancer cells. Disruption of the JAK2 pathway could be a potential for drug targeted therapy as disruption of the pathway would take away the cancer's ability to survive and proliferate. Inhibition of the JAK2 pathway could also leave the cancer cells vulnerable to NK cell-mediated cancer cell lysis. Another protein, KIT, is known to activate several signaling pathways. These pathways control many important cellular processes, such as cell growth and division, survival, and migration. Upregulation of KIT protein can also lead to the survival and further progression of cancer cells. KIT and JAK2 can be considered potential drug targets for colorectal cancer treatment.

The Contradictory Nature of African Slavery in Brazil

Eleanor E. Porter

Jaclyn A. Sumner, Ph.D.

Department of History

Between the years of 1530-1888, over four million Africans were exploited and sold into slavery in Brazil. This research mainly focuses on the time period of 1730 to 1790 due to the amount of primary and secondary source evidence found during this time period. The contradictory nature of this has to do with the human rights that were given to the African slaves in Brazil. African slaves were allowed to have legitimate marriages, received Catholic baptisms, participated in ritual god-parentage, and survived through cultivation of their own food through sustenance farming. My research aims to decipher how these African people who received all of these human rights were still seen as sub-human through the eyes of society. The historical evidence of this can be seen in the foundations established historically in the Iberian peninsula. This study will examine how through phenotypic racism, pseudoscience, and clerical differences on the view of African slaves, citizens justified enslaving Africans. This research relied on primary and secondary sources to further show evidence of my argument. Although, many slaves participated in marriage, had families, communal structures, and were baptized; the Portuguese living in Brazil were socialized to believe that African slaves were subhuman due to the historical contact with the Moors on the Iberian peninsula. The evidence for this can be seen in the capture of the slaves on the continent of Africa, the dehumanization that took place on the trans-Atlantic journey to Brazil, and the lack of basic human rights within continental Brazil.

Testing an Academic Entitlement Intervention

Liza Powers & Emma Roach

Stephanie D. Freis, Ph.D.

Department of Psychology

Academic entitlement is a student's belief that they deserve positive outcomes despite their level of effort. The most common forms of academically entitled behavior are (1) expecting instructors to comply with special requests, (2) externalizing responsibility for one's performance, and (3) believing that one is more knowledgeable of course content than others (Jiang et al, 2016). The purpose of this project was to investigate whether or not an intervention using implementation intentions, or if-then statements, could reduce academic entitlement. We first piloted this intervention in the 2018- 2019 academic year, and revised materials for the Fall 2019 semester. Across both studies, participants completed the intervention at midterm. At end-of-term, participants filled out self-report scales on academic entitlement and other variables such as perceptions of the course, instructor, sense of belonging, and sense of control. Levels of academic entitlement significantly decreased in the pilot study and participants increased their sense of personal control. However, these findings were not statistically significant when compared to a later control group. After improving the intervention materials, we observed a significant decrease in academic entitlement when compared to a control group in fall 2019, which impacted several other measured variables. We will discuss the implications of these results as well as ideas for future directions.

Opening Their Own Doors: Female Journalists and the Fashion Industry

Emily G. Price

J. Justin Brent, Ph.D.

Department of English

In the past, women with careers in writing struggled to succeed. With the wave of New Journalism and Second-Wave Feminism, this changed. Joan Didion and Helen Gurley Brown were two influential women that deconstructed the past and helped transform writing into a real and open liberal expression for women across the globe. Journalism was new in the way that it began to outline what women wanted to read. They wanted to see a vision of the American dream for single working women who desired to live life on their own terms and explore their sexuality. Over the course of a decade, careers for women in writing and journalism evolved more than ever. Female writers used the 1960's growing phenomenon of fashion and femininity as a stepping stool for their place in the writing realm, leaving a legacy on journalism today. Helen Gurley Brown and Joan Didion's influence within the fashion industry played a crucial role shaping what independence meant to American women.

The Rise of Right Wing Populism in Modern Europe

Nicholas J. Quatraro

Justin E. Lance, Ph.D.

Department of Political Science

The rise of right-wing populism has led to a surprising and divergent outcome among populist parties. For example, Lega Nord in Italy and the United Kingdom Independence Party (UKIP) in Great Britain are two right-wing populist parties that have had influence in previous election cycles, but Lega Nord has had much more electoral success than UKIP. This research aims to understand the disparity in electoral success. This research finds that to be considered a successful rightwing populist party, two variables are necessary conditions; one must have an anti-immigration policy platform along with citizens having anti-immigration feelings, and the leader must be charismatic. Using Eurobarometer, data findings show Italians have a much higher rate of “negative” feelings toward immigration than do citizens of the UK. Matteo Salvini, leader of Lega Nord, is also much more influential on social media than Gerard Batten, the most current former leader of UKIP. This research provides initial evidence of the difference in electoral success between Lega Nord and UKIP.

Movimientos secesionistas en España

Sarah L. Ramsbottom

Sharon E. Knight, Ph.D.

Department of Modern Foreign Language

Desde los principios de la Edad Media, Cataluña, más industrial y próspera que otras partes de la Península Ibérica, ha buscado existir independientemente de España. Cataluña se convirtió originalmente en parte de España en el siglo XV cuando el rey Fernando y la reina Isabel se casaron y unieron sus tierras. La región se mantuvo unida con el resto de España hasta el siglo XIX, cuando tuvieron un renovado sentido de la identidad de la cultura e independencia catalanas. Se inició una campaña por la autonomía política y el separatismo, y se revivió la lengua del catalán. Este deseo de autonomía política fue reprimido durante los cuarenta años de dictadura del general Francisco Franco. Desde la muerte de Franco en 1975, se ha restablecido la autonomía cultural en Cataluña, mientras que la autonomía política sigue siendo un sueño.

Una y otra vez, Cataluña ha intentado poner en marcha referéndums para obtener su independencia. Los catalanes se enorgullecen mucho de su cultura y su individualismo en la política. Relacionar su impulso de autonomía con los mismos impulsos de otras regiones puede revelar qué factores llevan a una parte de un país a desear e intentar crear su propio gobierno, y tal vez, declarar la independencia. En los últimos años, además de Cataluña, los movimientos secesionistas han tenido lugar

en Escocia, Venecia, y Quebec. Algunos han conjeturado que el estado de California puede incluso presentar una oferta para separarse de los Estados Unidos.

El objetivo principal de esta investigación de honores es estudiar la historia y la geografía, la lengua regional y las normas culturales, el estatus económico y el tipo de órgano de gobierno en lugares que buscan separarse y buscar puntos en común. Basándome en mi investigación, encontré que las regiones que piden la secesión tienen un sentimiento de orgullo profundamente arraigado con respecto a su gobierno, cultura e idioma derivado de su historia que ha llevado a un fuerte impulso de permanecer independiente mientras florecen en riqueza y éxito sin vínculos con sus órganos rectores anteriores o actuales y con las regiones vecinas.”

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Secessionist Movements in Spain

Since the early middle ages, Catalonia, more industrial and prosperous than other parts of the Iberian Peninsula, has sought to exist independently from Spain. Catalonia originally became a part of Spain in the 15th century when King Ferdinand and Queen Isabella married and united their kingdoms, Castile-Leon and Aragon. The region was closely integrated with other regions of Spain, until the 19th century, when Catalonians began to identify their Catalanian culture as different from other cultures in Spain. A campaign for political autonomy and separatism began, and the language of Catalan was revived. After the Spanish Civil War (1936-39), during the forty-year dictatorship of General Francisco Franco, this desire for Catalanian political autonomy was suppressed. Since Franco's death in 1975, cultural autonomy in Catalonia has been restored, while political autonomy remains a dream.

Time and time again, Catalonia has tried to put referendums in place to gain their independence. Catalonians hold a lot of pride in their culture and individualism in politics. Relating their drive for autonomy to other regions' drive for the same concept may reveal what factors lead a portion of a country to desire and attempt to create their own government, and perhaps, declare independence. In recent years, in addition to Catalonia, secessionist movements have taken place in Scotland, Venice, and Quebec. Some have conjectured that the state of California may even put forth a bid to secede from the United States.

The primary objective of this honors research in Spanish is to study the history and geography, regional language(s) and cultural norms, economic status, and type of governing body in places that seek to secede and to look for commonalities. Based on my research, I have found that regions calling for secession all have a deep-rooted feeling of pride concerning their government, culture, and language stemming from their history, a feeling that has led to a strong urge to stand independently while flourishing in wealth and success with no ties to their previous, or current, governing bodies and neighboring regions.

Myoelectric Prosthetic Hand

Preston K. Robinette

Eli T. Owens, Ph.D.

Department of Physics & Computer Science

There are approximately 40 million people world-wide in need of prosthetics. However, commercial upper prosthetic devices are often prohibitively expensive, costing tens of thousands of dollars. Currently, only about 5% of the people in the world who need a prosthetic have access to one. Highly functional, open source, low cost, 3D printed prosthetic devices will increase the number of people who have access to prosthetics. This project aims to design and develop myoelectric sensing and interpretation technology for integration with naturally controlled 3D printed prosthetics, resulting in low-cost upper prosthetics. Myoelectric prosthetics use the potential difference across contracting muscles for control. For this work, we are using machine learning algorithms to classify the signals into individual digit movements. To implement these algorithms, we built a database of signals from various users, thereby increasing the adaptability of the model. Producing an open source, myoelectrically controlled prosthetic that adapts to and learns about its user will present a huge improvement in 3D printed prosthetics and help many people worldwide.

The Impact of Piracy in Latin America

Thomas R. Roddey

Jaclyn A. Sumner, Ph.D.

Department of History

Between the 1500's and 1700's, imperial powers, such as England and Spain, were taking advantage of places in Latin America for their natural resources, like silver and gold, as well as their ports. In contrast to the general perception of pirates being autonomous, violent, characters, I argue that the English government contracted pirates as a source to plunder and disrupt Latin America. This argument stems from the fact that Queen Elizabeth I approved court orders allowing pirates to attack villages and ports in Latin America thus justifying England's actions within this region. England was impacting Latin America through violence and fear. This research unveils some of the imperialistic injustices in Latin America between the 1500's and 1700's.

Women in Surrealism and the Black Dahlia Murder

Katherine S. Russell

Laura Crary, Ph.D.

Department of Art

This presentation examines the use of the female form in Surrealism while relating it to the condition of Elizabeth Short's body in the Black Dahlia murder. In different Surrealist works, women's bodies are often objectified by simply using parts of the female anatomy that draw the attention of the male gaze such as breasts, legs, lips, and eyes. As women that had formerly been muses began creating their own work, artists' relationships with their muses began to shift. Complicating the relationship between Surrealism and the feminine, many female Surrealists preferred androgyny (such as Claude Cahun and Hannah Hoch), while a few of the male Surrealists took on highly feminized alter-egos (Duchamp and Bellmer). The second part of this presentation will be about the relationship between Surrealism and the Black Dahlia murder. When found, Elizabeth Short's body was bisected at the waist, slits made above the pubic area, and a smile slashed from ear to ear. Many believe the strange cuts were all part of a game called the Exquisite Corpse, an automatist game where the players draw what comes to mind based on the lines drawn by the previous player. There are many theories on who killed Elizabeth Short, but many point to friends of prominent Surrealists, such as George Hodel. This presentation bridges the art world to one of the most famous murders in American history, while calling attention to the use of the female form in Surrealist art.

A Study of White Oak (*Quercus alba*) Growth in Clinton, South Carolina

Sharmila Samuel

Michael O. Rischbieter, Ph.D.

Department of Biology

Dendroclimatology is the study of the effects of environmental changes on annual tree growth rings and has been used extensively in climate change research. Currently, the understanding is that tree rings will be wider during moist/cool years, and narrower during dry/warm years. The purpose of this research was to determine the influence of the local micro-environment on tree growth. To understand the response of white oaks in different environments, cores were taken from white oaks in an urban, transitional, and natural forest. The results from the core measurements showed that urban white oaks do not vary as much as the PDSI (Palmer Drought Severity Index) would suggest. Along with this finding, the white oaks from the transitional and natural forest appear to show greater agreement with the changing PDSI values. Based on the results from the statistical analysis of core ring data and the PDSI, we concluded that white oaks in a more stable environment respond less to climatic changes than white oaks in environments that are more stressed. Therefore, studies using tree ring data for climate proxies should gather data from trees in more stressed environments, which better represents the actual growth signal of these plants.

From Saigon to Beirut: How Israel Fought its Own Vietnam in Lebanon

Cooper R. Short

Roy B. Campbell, Ph.D.

Department of History

On June 6, 1982, Israel and the Israeli Defense Force invaded the sovereign nation of Lebanon under the auspices of Operation Peace for Galilee. They claimed to be fighting back against terrorism perpetrated by the Palestinian Liberation Organization. On June 27, 1982, a mere three weeks after the initial invasion, David K. Shipler of the New York Times reported and made the claim that Lebanon could be “Israel’s Vietnam.” Seeing as he made this claim in such short notice of the invasion, the only way to assess the validity of his claim is to look at it in retrospect. In this research presentation, one question will be answered: Was Shipler’s statement about Lebanon being equitable to the American experience in Vietnam a valid statement? Simply put, Shipler’s statements was accurate. From a micro level, these two events may not seem very similar. From a macro level, Vietnam and Lebanon, for their respective invaders, share 5 key elements that make them almost identical. Israel’s experience, as the research will show, was virtually the same as America’s.

Giving a Voice to the Voiceless: Allowing Serial Killers the Chance to Speak

R. Caleb Simpson

J. Justin Brent, Ph.D.

Department of English

Beginning in the 1980s, convicted serial killers have been given a voice from their prison cells. The purpose of the research is to show the importance of these texts through analysis of two works written by serial killers. The analysis will show what the reader can learn from these killers, that these killers still are people, and how the rise of confessional journalism is incorporated into these novels. From the rise of New Journalism in the 1960s, confessional journalism came about to help offer true first-hand accounts for news outlets which the audience loved. By using the same techniques, serial killers can write compelling autobiographies based on their life.

Heat Shock Protein 90 β Plays a Leading Role in Promoting Lipopolysaccharide (LPS)-induced Inflammation in Microglial Cells

Amanda G. Smith

Wei Lei, Ph.D.

Department of Pharmaceutical & Administrative Sciences

Heat shock protein 90 (Hsp90) is a family of chaperone proteins that consists of 4 isoforms, [Hsp90 α , Hsp90 β , glucose-regulated protein 94 (Grp94)], and tumor necrosis factor type 1 receptor-associated protein (TRAP1). They play a critical role to regulate numerous intracellular signaling pathways, such as inflammatory and pain signaling and modulating the folding, maturation and activation of their client proteins. Previous studies demonstrated that non-selective Hsp90 inhibitors, such as 17-N-allylamino-17-demethoxygeldanamycin (17-AAG), inhibited the inflammatory signaling pathways resulting in a reduction of inflammation and pain. However, the role of Hsp90 isoforms and co-chaperones in inflammation remains poorly understood. This study aimed to determine the molecular isoforms and co-chaperones by which Hsp90 promotes LPS-induced inflammation in microglial cells. BV-2, a murine microglial cell line, was treated with 17-AAG or Hsp90 isoform/co-chaperone-specific inhibitors for testing the generation of inflammatory mediators such as nitric oxide (NO) and the activation of NF- κ B. We found that Hsp90 β showed comparable inhibition as 17-AAG on NO production and NF- κ B activation over a 24 hour treatment period. These findings suggest that Hsp90 β is the key player in the LPS-induced neuroinflammation.

Arguments for the Necessity and Justification of Anti-Colonial Violence through the Algerian Revolution

Emily K. Swanigan

Roy B. Campbell, Ph.D.

Department of History

Anti-colonial violence helped shape the Algerian Revolution which ultimately developed the national sovereignty of Algeria. This research will specifically highlight the events which led Algeria and France into such a bloody war and will demonstrate the shortcomings of the French government during this period. Some questions asked are: (1) How did France fail to reconcile Algeria to itself through peaceful means in the years preceding the Algerian Revolution (1954-1961)? (2) Was the Algerian militant response validated and/or necessary in order to achieve political independence from France? This research will show that violent insurrection was an inevitable course of action for the natives of Algeria due to continual French dismissal and rejection of assimilation talks or peaceful democratic solutions. Key works from scholars such as Frantz Fanon and Jean-Paul Sartre highlight how violence through decolonization emerged.

American Hubris: The Battle of Mogadishu

Andrew M. Tezza

Roy B. Campbell, Ph.D.

Department of History

This research will cover the Battle of Mogadishu, its effects on the United States military, and United States public opinion toward the military and foreign operations stemming from media coverage. In addition, foreign policy changes as a consequence of the Battle of Mogadishu will be briefly discussed. Some of the main questions to be addressed by this research are: (1) Did the use of visual media heavily affect the public opinion of the United States towards the operations in Somalia? (2) How did the changes in public opinion affect the United States withdrawal from Somalia? (3) How did the lessons learned from the Battle of Mogadishu change the operations of the United States military in the future? This research will show that the Battle of Mogadishu had a significant effect on the United States military, including changes in foreign policy going forward. The research will also show that the shift in public opinion, due to relatively unrestricted media coverage, played a part in the rapid withdrawal from Somalia and the transition of the UNOSOM operation from a success to a failure, virtually overnight.

Man at the Crossroads

Eron Vergara

Laura Crary, Ph.D.

Department of Art

In 1932, Nelson Rockefeller and Todd-Robertson-Todd Engineering (development agency) commissioned Diego Rivera to paint a mural for the Rockefeller Center. During the process of the mural, Rivera changed some of the ideas that were originally from the sketch work and added an image of Lenin and the Soviet Russian May Day parade. When Rockefeller discovered the extra add-ons toward the painting and Rivera refused to make changes, Rockefeller covered the mural thus destroying the work of art. In this research, I wanted to learn more about the mural and public opinion regarding the destruction of Rivera's masterpieces.

Israel Defense Forces: The Military Masterminds of the Middle East

Cole Vieira

Roy B. Campbell, Ph.D.

Department of History

This research will go in depth into the Israeli Defense Forces (IDF) and will cover the characteristics of the Israeli military which will answer why they have been able to maintain an undefeated track record in war. Events and aspects evaluated include the Six-Day War (1967), the Yom Kippur War (1973), and aspects attributing to IDF landslide victories in both wars. The main questions of this research include: How has the IDF gained these victories? Do the Israeli's have a certain technological or militaristic edge over their enemies? Can these victories be attributed to certain failures of Israel's enemies in battle, or did the IDF simply outperform them? This research will show that since its establishment just over 70 years ago, the Israeli Defense Forces have earned and maintained the reputation as the fiercest military force in the Middle East, remaining undefeated in war, because of advanced weapon technology, a unique military society, military tactics, the failures of its enemies, and its close foreign relations and alliances.

Senior Art Exhibit

Lori Hart

Artist Statement

I was strolling through the grocery store one day, checking off items on my list when thoughts flooded my mind of a different time; of a time when the connection between our commodities and their sources was not so blurred. Where does your plastic-packaged slices of bacon come from? What is the source of those pre-cut, perfect squares of yellow cheese, or that tidy crate of clean eggs? Many know the answers to these questions, but do not possess an appreciation for the animals that provided these substances. An epidemic of disconnect has flooded society, and not many people think twice before putting on a wool sweater or cutting into a steak.

My artwork attempts to focus on the intricate relationship between man and animal; a relationship that I experience first-hand. The animals in my pieces are depicted in reverence and appreciation for their individual purposes. They serve as humble reminders of our roots and forge a link between man and beast that invites viewers to consider them as codependent of each other; a concept that has seemingly faded into the background of this modern age. I seek to instill appreciation and humble admiration for animals based on their functions, whether it be for companionship, food, or other commodities. Every trembling, rippling muscle that bulges beneath a sleek coat deserves adoration. The arch and twist of every horn, the bodies decorated with feathers, the twinkling of eyes, and the delicate whiskers demand recognition and respect.

Inspiration for my art derives from many sources, but many relate to my origin. Whether it be the chorus of early morning crowing, or the thudding of hooves on sundried turf, all remind me that there is more to the world than the beeping, ringing, and mechanical humming of modern life. I grew up in the countryside of Jonesville, SC, and have raised animals since childhood. I gained valuable experience in animal husbandry and use the animals on my miniature farm as sources of food and other commodities. My personal experience in this way of life is what influences my artwork and drives me to instill appreciation for these amazing creatures.

I admire the works of painters such as Jean-Baptiste Oudry and Rosa Bonheur, as their carefully detailed animals display their similar admiration for creatures, as well as establish a connection between beast and man. Although different in style, my artwork is created using my own experience along with the messages that these artists attempted to convey through their work. I use the media of charcoal, paint, and conte on canvas and paper because of their easy workability. I appreciate charcoal most, for it is versatile and traditional. I use it as an extension of my hand, and admire its ability to be smudged, smeared, and blended with my fingers. I prefer canvas and paper for their traditional aspects and for practical reasons, such as smoothness. As for the size of paper and canvas, that is an area that I continue to experiment with and would like to further explore in the future.





Please visit Lori's virtual exhibit at:

[https://www.presby.edu/academics/undergraduate/
academic-departmentsprograms/art-department/elizabeth-stone-
harper-gallery/](https://www.presby.edu/academics/undergraduate/academic-departmentsprograms/art-department/elizabeth-stone-harper-gallery/)