



**ABSTRACTS OF
HONORS THESIS PROJECTS
SPRING 2009**

**The Honors Program
Baylor University
Honors College
Waco, Texas**

HONORS PROGRAM THESIS ABSTRACTS

SPRING 2009 GRADUATES

Imma Achilike, Biology

Dr. Terrill F. Saxon, mentor

A Case Study Investigating Velo-cardio-facial syndrome and Expressive Language Delay

Velo-cardio-facial syndrome (VCFS) is a genetic disorder that is prevalent 1 in 4000 children. It affects many aspects of development in children including language. The purpose of this study is to document the expressive language delay patterns and interventional progress in a child with velo-cardio-facial syndrome over a period of 4 years. Essentially, this retrospective study will answer this question: will the methods of intervention used by the speech-language pathologist (SLP) produce a beneficial outcome for expressive language delay in children with VCFS? The subject was a child with this syndrome, aged 5 years 6 months. Results from diagnostic assessments and progress reports documented by a speech language pathologist, from the age of 2 years and 4 months formed the basis for this retrospective study. The study concludes with recommendations of a particular method of intervention for children with VCFS who also have expressive language delay.

Ariel Alexander, International Studies

Dr. Joan Supplee, mentor

Democracy re-establishing justice through truth: the Strengthening of Rule of Law in Argentina, Chile and Paraguay as seen through the effectiveness of their truth commissions

The actions of the Truth and Justice/Reconciliation commissions in Argentina, Chile and Paraguay, as representations of the re-establishment of rule of law within these countries differed greatly. This project shows how the actions taken during the dictatorship to remove or change rule of law, the atrocities committed, and the duration of said regimes directly affected the process of judicial strengthening and the breadth and quality of the actions taken by the different commissions. As a result of this analysis, it is possible to conclude that each case study is a prism for analyzing the strengthening of the judiciary as part of the re-democratization process in the Southern Cone. The different processes also highlight the areas where greater reforms could take place.

Daniel Alfson, Neuroscience

Dr. N. Bradley Keele, mentor

The role of prenatal stress in anxiety-like behavior in the rat: modulation by oxytocin

Studies show that several anxiety disorders develop largely as a consequence of the dysfunction of the hypothalamic-pituitary-adrenal (HPA) axis. Thus, rats having an HPA axis that is abnormally hypersensitive to stressful stimuli, particularly as a result of prenatal stress, serve as an insightful experimental model for studying such disorders. Additional studies indicate that the neuropeptide oxytocin (OT) provides negative feedback on the HPA axis, normally attenuating the stress response by decreasing corticosterone levels, and that the central nucleus of the amygdala (CeA) may play some part in mediating OT's negative feedback on the HPA axis. The present study investigates the effects of prenatal stress on the HPA axis together with the role of OT in regulating the HPA axis via the amygdala. Our primary hypothesis is that a decreased sensitivity to OT in the CeA of rats stressed during prenatal development will result in a decrease in the negative feedback of this stress coping mechanism, exhibited by an exaggerated level of anxiety-like behaviors and elevated baseline plasma corticosterone levels. To test this hypothesis, Sprague-Dawley rats that were either prenatally stressed or allowed to develop under normal conditions. Either OT or phosphate buffer solution (PBS) vehicle was then injected bilaterally into the CeA of both groups of animals via cannulae that were surgically implanted prior to testing. Anxiety-like behaviors were measured using the elevated plus maze (EPM) and the open field test (OFT), and baseline plasma corticosterone levels were analyzed using a biochemical assay. This study reveals information regarding the effects of OT in the negative feedback loop of the HPA axis of prenatally stressed rats and, ultimately, has clinical significance since the results may shed light on neural mechanisms underlying psychopathology.

Jared Allen, Entrepreneurship and Economics

Dr. Marlene Reed, mentor

The Sustainability of Economic Growth in China

Since market reforms began in 1978, China's economy has grown at an average rate of 9.8% per year. Although certain aspects were privatized by these reforms, the government continues to have a significant role in the economy. Its affiliation with a majority of the leading firms in China has substantially diluted competition. As a result, there is no incentive for government affiliated firms to innovate. According to Solow, sustained economic progress cannot occur without technological innovation. Thus, China's recent economic growth is not sustainable under the current system of market socialism.

Kirsten Appleyard, University Scholar

Dr. David L. Jeffrey, mentor

"Moi je vis un peu avec les anges": The Search for Transcendence in the Contemporary Art of Arcabas

In a largely post-Christian age of painting there has surfaced a Catholic artist of considerable inherent interest, both aesthetic and theological. Lauded as one of the masters of contemporary sacred art, Arcabas is rapidly emerging to prominence in his native country of France; he is as yet, however, largely unknown in North America. Accordingly, the first chapter of this thesis provides an introduction to the developing career of Arcabas – a kind of taxonomy – to serve as a necessary prolegomena to closer analysis of some of his signal achievements. The three subsequent chapters seek to examine Arcabas's work in light of his réssourcement Catholic aesthetic and thoughtful theological engagement with the three transcendentals, namely the True, the Good, and the Beautiful.

Melanie Arndt, Biology

Dr. Doug Matthews, mentor

Differential effects of adolescents and adults enriched and impoverished environments on depression.

Previous research has shown that manipulating the environment that a rat is housed will affect the immobility time in a Forced Swim Test (FST). A FST is a widely accepted method that measures the time a rat spends in an immobile posture. This time is correlated to depression, because it is decreased with the administration of antidepressants. Despite the high risk of depression in adolescents, there has not been a study comparing how the housing environment affects adolescents and adult rats using a FST. We housed adolescent and adult rats in both an enriched environment and an impoverished environment for twenty days. We then performed a FST and analyzed the immobility times.

Adam L. Arrington, Political Science

Dr. Jerold R. Waltman, mentor

Whose Land Is It Anyway: The Evolution of Eminent Domain in the United States

It sounds simple enough: "[private property shall not] be taken for public use, without just compensation." For years, government – at the federal, state and local level – utilized this power, known as "eminent domain," for purposes that few could dispute were public use, but as times and circumstances changed, so, too, did the concept of "public use." A litany of federal and state court cases, as well as articles in everything from scholarly journals to community newsletters, betrays the government's history of defending a wide range of projects as legitimate exercise of its eminent domain power, and the judiciary's almost unbroken streak of acquiescence. My thesis offers a concise history of eminent domain leading up to the Supreme Court's seminal decision in *Berman v. Parker* (1954), followed by in-depth analyses of that and two other landmark cases—*Poletown Neighborhood Council v. City of Detroit* (1981), a Michigan Supreme Court decision which exemplifies state and local courts' acceptance of economic development as "public use", and *Kelo v. City of New London* (2005), in which the U.S. Supreme Court established this doctrine at the federal level—that help explain both the causes and effects of government's ever-expanding eminent domain power.

Victoria Bongat, Journalism--News Editorial

Dr. Amanda Sturgill, mentor

How the Media Influence Democracy: Information-Gathering Habits of Voters

America's founding fathers believed democracy could best be preserved and furthered by an educated citizenry. The purpose of this study was to examine how voters get the information they use to vote and relate the findings to the larger question of whether media help, hurt or have no effect on democracy, since media has changed and become more prevalent. Previous research suggested the extent of the media's influence upon democracy was significant. A survey with fifteen questions related to media consumption was administered to voluntary participants at a nearby polling center on Election Day. Based on their responses and my analysis, it can be concluded that voters do use multiple sources to get the information they need, more sources yield more reliable information than a single source, and certain media can be considered credible.

John Bridges, Biology

Dr. James Marcum, mentor

Chronic Pain and Phenomenology: A Case Study

Patients with chronic pain often experience a communication breakdown within their relationship with their doctor. This thesis focuses on a case study of a patient who suffers from chronic persistent headaches. This report shows ways in which the biomedical approach to chronic pain has failed this particular patient and will explore alternate methods—complementary and alternative medicine and phenomenology—to addressing the patient's issues with chronic pain and the difficulties found in communicating that pain with doctors. The later chapters make suggestions about how the biomedical model's approach to chronic pain can be supplemented and enhanced by these different approaches to the management and understanding of chronic pain.

Mallory Briggs, Religion and Journalism

Dr. Amy Vail, mentor

Understanding Hell through the Eyes of C. S. Lewis

The purpose of the paper is to make a thorough analysis of the views of C.S. Lewis with respect to the doctrine and reality of Hell. Three texts are particularly useful for an understanding of Lewis's conception of damnation: *The Problem of Pain*, *The Screwtape Letters*, and *The Great Divorce*. Each book will be analyzed separately and in conjunction with the two other works. Overall, Lewis's focus lies in the reality of Hell and individual choice.

Tchanavia Bryant, Psychology

Dr. Helen Benedict, mentor

Autism: A Literature Review of the Various Treatments Available

Autism is a mental disorder that affects men, women, and children of all races and backgrounds. This thesis will focus on reviewing the effectiveness of various types of treatments available for moderate to severe autistic symptoms. Peer reviewed articles were the main source of discovering the various treatments and their effectiveness. Various articles were read in order to determine the general consensus of the scientific community about the effectiveness of different treatments. The thesis is broken up into four major points: a history of autism, a review of the pharmaceutical treatments of autistic symptoms, a review of the non-pharmaceutical treatments of autistic symptoms, and my review of the various treatments. Results suggest that the most effective treatment is dependent on the individual, but it seems to combination of pharmaceutical and non-pharmaceutical treatments. This conclusion may help parents to understand that there is no one "cure" for autism.

Eric Bunch, Math

Dr. David J. Ryden, mentor

Forcing Relation Between Patterns of Maximal Proper Periodic Intervals

Sarkovskii's Theorem completely describes the forcing relation between periods of periodic points. In [1], Misiurewicz et al. define patterns of periodic points, and investigate the forcing relation between patterns of periodic points. Ryden, in [3], extends the idea of a periodic point to that of a maximal proper periodic interval, and he proves Sarkovskii's Theorem for maximal proper periodic intervals. In this paper, we define the pattern of a maximal proper periodic interval, as well as the forcing relation between patterns of periodic intervals. This forcing relation is investigated using the properties of patterns of maximal proper periodic intervals.

William Caylor, Economics

Dr. Steve Green, mentor

High-stakes Testing and the Teacher Workforce

Many states implemented high-stakes educational testing in the 1990s. I use state-level data to examine the effects of such testing on teacher wages, employment and the prevalence of private education, controlling for student characteristics. The effects of testing on these variables may suggest a change in the quality of the teacher workforce.

Jenna Chang, Psychology

Dr. Keith Sanford, mentor

Using Perceived Partner's Emotion in Predicting Forgiveness in Romantic Relationships

A sample of 113 participants in dating relationships completed an online questionnaire to investigate the extent to which perceived negative emotion in one's romantic partner during conflict predicts forgiveness. Participants were asked to recall a specific conflict that occurred in their current relationship and completed scales measuring the extent they perceived 3 types of negative emotions in their partner at the time of the conflict: hard emotion (e.g. anger or aggravation) soft emotion (e.g. hurt or sadness) and flat emotion (e.g. boredom or indifference), as well as four outcomes pertaining to forgiveness: negative attributions, desire for revenge, avoidance of the partner, and positive/negative valence of attitudes toward the partner. Results indicated that perceived hard, soft, and flat emotion were significantly related to components of forgiveness, yet, the most striking finding involved flat emotion. Perceived flat emotion produced robust and consistent correlations across all four components of forgiveness independent from relationship satisfaction. These findings support the general conclusion that perceptions in a romantic partner's emotion during conflict relate to forgiveness and specifically suggest that perceiving flat emotion in one's partner is the strongest predictor of non-forgiveness.

Sam Chen, Philosophy and Political Science

Dr. David K. Nichols, mentor

Defending Religious Liberty: Is a Secular Definition of Religion Possible?

Since the landmark case *Everson v. Board of Education* (1947), the U.S. Supreme Court has continually sought to define religion in exclusively secular terms, in hopes of, on the one hand, preserving religious liberty and, on the other, establishing a clear and distinct line between government and religion. This thesis carefully analyzes and evaluates a number of constitutional tests introduced by the Supreme Court to accomplish the aforementioned task. The Lemon Test (*Lemon v. Kurtzman*), the Establishment Test (*Lynch v. Donnelly*), and the Coercion Test (*Lee v. Weisman*) form the Court's position on establishment. The right to free exercise is outlined by the Sherbert Test (*Sherbert v. Verner*) and a number of other precedents developed in cases such as *Employment Division v. Smith*, *Wisconsin v. Yoder*, and *Lyng v. Northwestern Indian CPA*. These tests and precedents have guided the courts in their quest to defend religious liberty by balancing the Establishment and Free Exercise Clauses of the First Amendment. Through this process of understanding and critically assessing the development in establishment and free exercise case law, this thesis demonstrates the limits and contradictions inherent in the high Court's attempt at an exclusively secular definition of religion, which is a road block in the path of defending religious liberty.

Justin Chetta, Medical Humanities and Biology

Dr. Pat Danley, mentor

Acoustic Variation in Rock-Dwelling Cichlids

The cichlid radiation of Lake Malawi is a model system for observing recent and rapid species diversifications. Among other reasons (e.g. trophic proclivity), an intense sexual preference by females may account for such a rapid phenomenon. Variation and preference in hues, patterns, bowers, pheromones, and courtship behaviors has already been noted. This study observed six different species in situ in regards to acoustic variation among five different parameters. Disparate sonic signals were found among species and may further account for the observed rapid speciation of Lake Malawi cichlids.

Preston Clark, English

Dr. Richard R. Russell, mentor

The Distortions of "The Wandering Rocks" to "Ulysses"

In this thesis I argue that Episode Ten of "Ulysses," "The Wandering Rocks" is a distorted and insufficient version of the entire novel. First, the narrator of "The Wandering Rocks" is a cynical and superficial version of the initial narrator of the first six episodes. The deficient qualities of this narrator cause him to misrepresent the events and themes of the novel. Also, "The Wandering Rocks" is sub-divided into nineteen sections. Each of the first eighteen sections corresponds respectively to the eighteen episodes of "Ulysses." The final section applies the point of view of the narrator of "The Wandering Rocks" to a tour of Dublin, showing a city very much unlike Dublin as presented in the rest of the novel.

Sam Cole, University Scholar

Dr. Robert C. Miner, mentor

The Virtue of Faith

In this thesis, I expound upon the *Secunda Secundae* of Saint Thomas Aquinas' *Summa Theologiae* in order to answer a fundamental question of the Christian religion: what is faith? Following Thomas, I address this question in three stages: First, I consider the object and act of faith. What is the object of faith? Does faith seek to know God, or does it seek to know facts about God? Is "know" the appropriate word to use in this context? What is belief and how is it related to faith? Is belief the act of faith? While considering the object and act of faith, I also consider its certainty. Is faith "certain?" What would it mean to call faith certain? Why is faith certain? Second, I define the habit and the virtue of faith. Can faith be virtuous? It seems that faith is credulity. If it is not mere credulity, why is it more than credulity? What is the difference between the habit of faith and the virtue of faith? For Thomas, the virtue of faith is faith formed by charity. What does the virtue of faith have to do with charity? What does it mean to say that virtuous faith must be formed by charity? Third, I sharpen my definition of the virtue of faith by considering its opposites. What is the vice most opposed to the virtue of faith? If it is unfaithfulness, why is unfaithfulness most opposed? What are the different kinds of unfaithfulness? What can an examination of heresy, apostasy, and blasphemy tell one about faith? In these three chapters, I give answers to all of these questions with the goal of defining faith. In the process, I also defend Thomas' account of faith and struggle to give ground for it in a contemporary context.

Lexi Correll, Psychology

Dr. Joe Cox, mentor

Substance abuse policies in U.S. companies and why simply having a policy is not enough

More than half of large U.S. companies have a substance abuse policy, yet drug or alcohol abuse are listed in almost all reports of disciplinary action, and the number of drug and alcohol-related lost-time accidents continues to increase each year. This thesis will examine existing literature to identify factors related to the effectiveness of substance abuse policies in U.S. companies and make recommendations for the design and implementation of enforceable policies related to employee drug and alcohol use. It is crucial for U.S. companies to implement clear and effective substance abuse policies to curb the spread of drug and alcohol abuse through American workforces. Only by working to form a cohesive program that goes beyond drug testing alone can the American workforce hope to overcome the burden of substance abuse.

Michael Do, University Scholar

Dr. Bryan Brooks, mentor

Using Mammalian Pharmacological Data to Predict Responses in Pimephales promelas Following Exposure to Benzodiazepines and a Contraindicated Therapeutic

Benzodiazepines are a class of pharmaceuticals commonly used to treat anxiety disorders. Two of the more commonly prescribed ones are alprazolam (marketed as Xanax) and diazepam (Valium). It has been proposed that since many of the enzyme and receptor systems are conserved between mammals and fish, mammalian pharmacological data provided by drug studies can be applied to fish. The mammal to fish model states that when the plasma concentration of the drug in fish is equal to the therapeutic blood concentration in mammals, an effect should also be elicited in fish. This particular study exposes fathead minnows (*Pimephales promelas*) to alprazolam and diazepam at concentrations predicted by the mammal to fish model to have an effect. Fish were also exposed to a mixture of diazepam and fluoxetine, a known contraindicator of diazepam and a prevalent antidepressant. Results indicate that neither of the benzodiazepines individually have any sublethal effects on fish. Accordingly, the mammal to fish model does not apply to benzodiazepines, as no effects were exhibited at the predicted concentrations. The fluoxetine-diazepam mixture showed that fluoxetine did not significantly potentiate the toxicity of diazepam, indicating that the drug interaction was weak.

Jenny Dresler, Biology

Dr. Richard Duhrkopf, mentor

A Survey of Mosquitoes in McLennan County, Texas, as a Method for Predicting Mosquito Populations as Related to Weather

Climate change is in the forefront of today's scientific inquiries as are mosquito-vectored diseases such as West Nile virus, malaria, dengue and yellow fever. This study examines the impact of changing weather conditions on the populations of disease-transmitting mosquitoes in McLennan County, TX, comparing insect collection data from an excessively rainy year, 1992, to data from 2008, a year that received low rainfall during the spring and summer months. The results are compared in order to determine what species of mosquitoes are most prevalent in the respective climates, insect density, and the potential for mosquito-vectored diseases in the county. Awareness of species present will help avoid future threats to human and animal health.

Christopher Dunn, University Scholar

Dr. David Uber, mentor

The Student's Guide to Studying Abroad in France

Planning and carrying out a semester or year abroad can be quite challenging, but I have made it my goal to guide students through this difficult and complicated process. With the compilation of my successes and failures studying abroad, I hope to simplify this complex process. And of course, who could be more helpful than someone who has done it before? It is from my preparatory experiences that I write the first half of this piece. In the second half, I discuss daily life in France as an international student. Studying abroad is an overwhelming feat, but it is also unquestionably rewarding. I hope the knowledge I share with students will both organize their preparations and enhance their stays in France.

Ayla Farris, University Scholar

Dr. Tamarah Adair, mentor

Evaluation of SCCmec types for Methicillin-Resistant Staphylococcus aureus Strains Isolated from Healthy Carriers

Staphylococcus aureus (*S. aureus*), the most common cause of hospital-acquired infection, and other staphylococci developed drug resistance soon after penicillin was introduced. Today, less than 10% of species are impacted by this antibiotic. Because of this, other "semi-synthetic" penicillins were developed. These included methicillin, nafcillin, oxacillin, and dicloxacillin. Over time, staphylococcus bacteria developed resistance to these drugs, as well. Methicillin-resistant *S. aureus* is known by the acronym, "MRSA". Both hospital (HA) and community (CA) strains of MRSA present a significant challenge to medical care providers around the world because they have become ubiquitous in the population, and in some cases can manifest serious, even life-threatening infections. The purpose of this study is to determine the SCCmec types of MRSA strains isolated from healthy carriers on a college campus, and draw conclusions from those data about the relative importance of CA-MRSA and HA-MRSA in that community. Results of the study are compared with epidemiological expectations, in light of the risk factors of a student population. Implications of this research for future HA- and CA-MRSA studies are explored, as well.

Eileen Fernandez, Physics and Math
Dr. Lorin S. Matthews, mentor

The Martian System and Saturn's F Ring

Interest in circumplanetary dust is spurred by the interactions between the grains and their plasma environment. When analyzed, the interactions serve as probes to the qualities of the plasma. Saturn's F ring presents a complex system to analyze, as it is dynamic and changes in a timescale of weeks. This study presents a model for circumplanetary dust using a fifth order Runge-Kutta method in a Matrix Laboratory (MATLAB) program. It is built from a Formula Translating System (FORTRAN) program used to study circumplanetary Martian dust and includes effects due to the magnetic field, Poynting-Robertson drag, solar radiation force, gravitational forces due to the sun, the planet, and satellites, and the spherical harmonic contribution of the planet's gravity (Nazzario 1997)). This study begins with an analysis of the behavior of grains in the Martian system, which is compared to a previous analysis done by Burns et al. (2001). The program is then generalized to the Saturnian system and used to examine Saturn's E ring; results are compared with work done by Hamilton (2002) and Burns et al. (2001), in order to test the accuracy of the program in the generalization to Saturn's system. Finally the program is used to study the odd behavior of Saturn's F ring, where we expect an accurate model of the charged grains' behavior.

Rachel M. Frankeny, Economics and Political Science
Dr. Jerold Waltman and Dr. James Henderson, mentors

The Political and Policy Challenges of U.S. Health Care Reform

Few issues in American politics today garner as much attention and debate as the issue of health care, yet there is still a great deal of ambiguity as to what reform is possible and what reform is needed, if any. Thus, this work aims at evaluating, at a basic level, first the political and then the policy challenges of health care reform in the United States. After a general discussion of public opinion and partisan differences, as these substantially affect the political viability of reform itself and of various reform proposals, I move on to address whether the two areas of primary concern, the uninsured and costs, are indeed creating major problems or even a health care crisis. I evaluate the current trends in these two areas and provide an analysis of the types of problems that the trends of rising numbers of uninsured and rising costs are creating for the country. Then, after showing that these problems are both serious and severe and that the need for reform to alleviate them is indeed pressing, I conclude by evaluating the reform plan set forth by President Obama in light of how well the plan accords with the aforementioned political and policy challenges of reform.

Jessica Frederick, Sociology
Dr. Jerry Park, mentor

Phenotype's influence on racial saliency in Black Americans

There are a variety of racial and ethnic groups whose people include a broad spectrum of skin tones. Skin color has an impact on status within most minority communities. Within the African-American community, there is a history of color- based discrimination. The discriminatory treatment of individuals falling within the same "racial" group on the basis of skin color is colorism. This thesis focuses on the way in which racial identity forms in those who are racially black. Further, this thesis explores how skin color and hair texture affect the formation of racial identity

Lisa Funkhouser, Biology
Dr. Sang-Chul Nam, mentor

An Examination of the Roles of LBK1 and AMPK in the Maintenance of Cell Polarity in Drosophila Photoreceptor Cells under Energetic Stress Condition

Retinal photoreceptor cells are highly polarized epithelial cells with distinct apical and basolateral domains. The establishment and maintenance of cell polarity is regulated by specific protein kinases that direct the asymmetrical distribution of cellular constituents. This thesis examines the ability of two protein kinases, LKB1 and AMPK, to maintain cellular polarity in Drosophila photoreceptor cells under energetic stress conditions simulated by glucose deprivation. Mosaic clones in the pupal eye were generated using the ey-FLP/FRT system and were visualized using a confocal microscope after staining with fluorescent antibodies against known polarity markers. LKB1^{-/-} cells had morphological defects under both conditions, while AMPK^{-/-} mutants exhibited defects only under energetic stress conditions, indicating that AMPK is required under energetic stress to maintain cell structure. However, basic cell polarity was preserved in both mutants, suggesting that LKB1 and AMPK may play a greater role in maintaining the cellular architecture of a cell than maintaining its polarity

Monike Garabieta, Biology

Dr. Ann E. Rushing, mentor

Eugenics and Morality: Understanding the Supposed Virtue of the "Greater Good"

In this thesis, morality will be a cornerstone to the discussion of eugenic events. Eugenics, or the systematic control and alleged improvement of a society's human characteristics, has been a topic of moral uncertainty for centuries. In particular, the morality concerning eugenics lies with the notion of "for the greater good," what that phrase implies, and whether the phrase should be applicable in situations with high amounts of moral discernment. This inquiry will be discussed within the realm of morality and eugenics by examining every avenue of intent in each historical and current event. The purpose of this discussion is to finally reflect on the uniqueness of human nature and the possibilities that lie within free will through current perspectives and exposition.

Dannee Geshay, University Scholar

Dr. James Marcum, mentor

Aromatase Inhibitors and Breast Cancer

Breast cancer is a complex, multifactorial disease in which alterations take place in a number of cellular pathways involving cell growth and proliferation. Such pathways represent molecular mechanisms regulated by various genes, including the oncogenes HER2, c-MYC, and RAS, the tumor suppressor genes RB and TP53, and the breast cancer susceptibility genes BRCA1 and BRCA2. These and other cellular pathways are providing effective targets for therapeutic treatment of breast cancer. It has been found that estrogens can play a role in the development of breast cancer; thus, the estrogen synthesis pathway represents another attractive target for therapeutic development. Specifically, therapies targeting the inhibition of aromatase, an enzyme critical in the synthesis of estrogen, are being explored and tested in postmenopausal women.

Alex Grasso, Psychology

Dr. Charles Weaver, mentor

Fantasy and Organized Serial Homicide

Since the 1980s, a distinct typology of organized/disorganized has emerged in the study of serial homicide. These typologies are suggested to classify serial homicide from two perspectives. First, they represent the covert, or psychological, aspects of serial murder. Next, these typologies are also expected to describe the overt, or behavioral, aspects of serial murder. Conclusions regarding fantasy's effect on the motivations and actions of serial murderers are evidenced in the forensic research completed by the FBI's Behavioral Science Unit and the articles published in peer-reviewed journals. This thesis will discuss the relationship of fantasy with the organized typology of serial killers in two hypotheses: (1) Organized serial killers are motivated to offend differently, and offend for different reasons, than disorganized offenders because of pervasive fantasy lives, and (2) Organized serial killers offend repetitively because of progressive fantasy lives.

Nathan Grohmann, University Scholar

Dr. Kevin Pinney, mentor

"Design, Synthesis, and Characterization of Combretastatin and Benzosuberene Analogues for Potential Use as Vascular Disrupting Agents"

The discovery and development of vascular disrupting agents (VDAs) represents a relatively new and exciting area in cancer chemotherapy. VDAs damage existing vasculature in the tumor microenvironment thus starving tumors of necessary oxygen and nutrients. Beyond the cancer field, VDAs also have the potential to be useful in the treatment of certain types of macular degeneration, functioning by selectively damaging the aberrant neovascularization in the retina that is characteristic of this disease. The scope of our current research centers on the discovery of new molecules that demonstrate molecular recognition for the colchicine binding site on tubulin and inhibit the assembly of tubulin into microtubules. In principle, the most effective VDAs will be capable of selectively damaging the microvessels feeding tumors while leaving intact the vasculature feeding healthy tissue. By interfering with the assembly of tubulin into microtubules in the endothelial cells lining tumor vasculature, a sequence of cell signaling events results in morphological changes in the endothelial cells, causing them to go from flat to round, thus blocking blood flow. In this study, we present the design, synthetic route, and initial biochemical and biological evaluation of new benzosuberene analogues and related compounds. The synthetic route involves a unique adaptation of the classic Wittig reaction, as well as a ring cyclization facilitated by polyphosphoric acid. It is our intention that certain of these compounds might be improved VDAs that are beneficial in the treatment of cancer.

Dodge Grootemaat, Political Science

Dr. Dwight Allman, mentor

Tradition and Revolution

The divergence that occurs in political theory between Erasmus's Education of a Christian Prince and Machiavelli's The Prince, both written in the same decade, is arguably the most substantial rift in the history of political philosophy. Machiavelli swung the pendulum of political theory away from the classical understanding to the completely opposite end, where it remained throughout modernity. Despite Machiavelli's past philosophical victories, we are amidst yet another political revolution—one in which Machiavelli's banner is beginning to fray. Realism's overwhelming dominance and its complementary understanding that politics are nothing more than a game of survival has finally started eroding in light of a neoclassical reawakening; the pendulum is drifting away from Machiavelli's political science due to the gravity of a developing political morality, and hopefully soon we will find ourselves at last properly centered between the classical and the modern.

Katie Gulley, Journalism--Public Relations

Dr. Sara Stone, mentor

Presidential Campaigns and the Media : An Examination of Media Effects and Campaign Strategies during the 1988, 2000 and 2008 Elections

Over the past few decades, the evolution of technology has drastically affected the news media and campaign strategies related to U.S. presidential elections. The 1988, 2000 and 2008 elections provide an opportunity to compare a two-decade span of general elections without incumbent contenders. News media outlets – including radio, newspapers, broadcast news and Internet sites – changed their reporting techniques dramatically from 1988 to 2008, affecting voters' knowledge and perceptions about the election. By documenting changes in media development and observing statistics about the nationwide consumption of media related to presidential campaigns, this research delves into increasing the understanding of the effects of news media and effectiveness of candidates' campaign strategies. Although factors such as experience and stance on issues are important to U.S. voters, this study suggests that a presidential campaign's media strategy may be the deciding factor in selecting our nation's Commander-in-Chief.

Alisha Hash, History and International Studies

Dr. Michael Parrish, mentor

The Soiled Sisterhood: America's Debauched Past

The late eighteenth century and early nineteenth century saw a swell in the number of legal or quasi-legal bawdy houses across the United States. This thesis will be broken up into three distinct parts. First, I will look at the rise of the red light district and its roots in the American Civil War. This section will deal primarily with the affects of prostitution on the troops and how the army dealt with the soiled doves. By the end of the Civil War red light districts had sprung up in urban areas across the country, including right here in Waco, Texas. Chapter two will be an in depth case study of Waco's infamous Reservation and her inmates. Lastly, this thesis will focus on the moral crusades of the Progressive Era that resulted in the closing down of many red-light districts.

Eric Headstream, Philosophy and Great Texts

Dr. Robert C. Miner, mentor

Hegel's Two Heresies?

The theological implications of the philosophical project of G.W.F. Hegel (1770-1831) often pass relatively unexamined compared to other areas of Hegel's project. Yet, there is a long history of debate over the nature and intent of Hegel's theology. Critics and commentators have at various times judged Hegel to be a heterodox Christian, a panentheist, or even "the father of modern atheism." The majority of these interpretations result from the conclusion that Hegelian theology either humanizes God or divinizes humanity. In recent years, however, there have been attempts to defend Hegel and his thought as authentically Christian and orthodox. In this project, I examine the validity of this orthodox reading of Hegel with a view to its strengths and weaknesses and the degree to which this interpretation is grounded in a rehabilitation of the Hegelian mediation between the aforementioned extremes (humanization and divinization). I compare and contrast the various interpretations on crucial points of Hegelian thought in order to show by contrast whether Hegel can survive these criticisms and agree with Christian orthodoxy.

Andrew Hill, University Scholar

Dr. Ronald Morgan, mentor

An Analysis of Krylov Subspace and Multigrid Methods for Symmetric Positive Definite Matrices

The rise of modern computing has made it possible to solve many problems once thought impossible, including numerical solutions for very large matrices. Two of the most active fields of research involve Krylov Subspaces generated by the matrix-vector combination, and the Multigrid method. This thesis analyses both families of methods, including analyses of computational efficiency. After comparing the methods, it seeks to characterize the weaknesses of each in such a way as to facilitate the development of a hybrid method involving the superior aspects of each. It then compares these characteristics to current hybrid methods that have already been developed.

Emily Hinkle, University Scholar

Dr. Jon Singletary, mentor

An Impoverished Theology: Christian Concern for the Poor in Twentieth Century America

The desperate poverty that affects so many Americans stands in stark contrast to the wealth enjoyed by many affluent Christians who claim faithfulness to a gospel that seems to stand with the marginalized. How has the American church fallen into the lamentable trap of comfort and domestication when given a gospel of radical social concern that should eradicate poverty statistics? There seem to be three theological problems set in the mindset of the typical American layperson, and an examination of these theological abuses and their history serves as grounds for restoration of relationship to the poor. These problems – an overly allegorical interpretation of scripture, an overly eschatological view of the Kingdom of God, and an overly individualistic understanding of faith – lend themselves to neglect of the impoverished. The recognition of these problems and the proper understanding of allegory, eschatology and piety allow oneself instead to become part of God's Kingdom narrative in which the poor are no longer forsaken.

Lynda Hoang, Biology

Dr. Myeongwoo Lee, mentor

Functional Analysis of NPXY Motif in β integrin Reveals Novel Interaction with Extracellular Matrix in vivo

Integrin, a cell surface α - β heterodimeric receptor that consists of two conserved NPXY (Asn-Pro-X-Tyr), interacts with the extracellular matrix (ECM) to control cellular organization. NPXY is a tyrosine phosphorylation motif that binds to the PTB (phospho-tyrosine binding) domain of other proteins. Transgenic *Caenorhabditis elegans* were created with mutations in the conserved tyrosine (Y) to glutamate (E) residues in the cytoplasmic tail of β *pat-3* integrin. The Y to E mutation showed various defects in muscle and gonad tissues, caused dominant negative phenotypes when introduced in the wild-type N2 background, and rescued a *pat-3* null allele. Therefore, in the mutation or absence of the conserved Y, abnormalities in the body shape and physiological imbalances arise, indicating that Y is important in development. Further analysis will provide insight into understanding the role of the conserved Y in the β *pat-3* integrin cytoplasmic tail and human diseases, including muscular dystrophy, cancer metastasis, and cardiovascular disorders.

Jackie Hyland, International Studies and Journalism

Dr. Brad Owens, mentor

Facing Violence, Transforming Politics: Women in the Twenty-first Century in South America

Women represent approximately half of the world's population, yet they are wholly and severely underrepresented in politics. The United Nations has called violence against women the number one human rights violation against women and the greatest obstacle for women overcome to enter into politics. South America has made great strides in the last few years, electing the first two women presidents in the region and created important anti-violence legislation, yet more needs to be done. This thesis examines the current political and human rights situation of women in South America, its history, achievements, setbacks, and the most effective ways for continual improvement. When the lives of women are improved, they are relieved from role of the oppressed, men are relieved from the role of the oppressor, and children learners of oppression. These gains break the cycle of violence and lead to a better, freer, and more equal world.

Amy Issa, Biology

Dr. Matthew S. Stanford, mentor

Correlation between health and the tangibility of God

Multiple studies have shown that a correlation between health and religiosity exists. In this study, I am attempting to see if there is an association between health and the tangibility of God by surveying 307 Christian college students. The survey encompasses various spiritual and health related questions including the Hood and Rasch Mysticism Scale, Attachment to God scale, K6 Psychological Distress scale, Perceived Stress scale, Dissociative Experiences Scale, Profile of Mood States, and Santa Clara Scale. It also includes a section allowing the subjects to describe their mystical experiences. These can be identified as dreams, visions, speaking in tongues, physical healing, audibly hearing God speak, etc. My hypothesis is that the people who have had mystical experiences, and therefore, have a very close, tangible relationship to God, will have better overall health than the students who do not. The results of this study reveal that students who have had mystical experiences possess more vigor and are less likely to suffer from depression and psychological distress.

Rebecca Johnson, University Scholar

Dr. Stan Denman, mentor

Act One of a Two Act Play: What We May Be --

Abstract: This play follows three female roommates through one semester at college. It explores their individual evolving identities and relationships with each other. It deals with circumstantial and emotional experiences most college students face, including romantic relationships, betrayal, and changing as a person while attempting to remain friends throughout the process. This plot is an interpretation of events my friends and I have experienced while at Baylor.

Tom Just, German and International Studies

Dr. Andrew Wisely, mentor

Waging Peace: Leipzig's Peaceful Revolution

Common conceptions of revolution often focus upon instances of violence. Revolution in the German Democratic Republic, however, came about with a surprising lack of violence. Images of Berliners tearing down the wall that divided East from West often dominate our memory of what occurred, but the seeds for revolution were planted long before that night. The peaceful demonstrations in Leipzig, particularly on October 9, 1989, that signaled the end of the totalitarian regime were enabled by three primary factors: the political reforms originating from Moscow, the establishment of social capital, and the role of the church. This investigation proves that each of these factors was pivotal for a peaceful revolution to succeed. Furthermore, the writings of the political philosopher Hannah Arendt illuminate how the power of the people ultimately usurped the power of one of the world's most oppressive totalitarian states.

George Kannarkat, International Studies and Biology

Dr. Chris Kearney, mentor

Arsenic Phytoremediation Through the Overexpression of Arsenate Reductase, ARC2

Arsenic toxicity due to soil contamination of groundwater is a major public health concern especially in countries like Bangladesh. Through the use of genetic engineering, plants may be manipulated to express proteins that allow them to accumulate arsenic in their leaf tissues, thereby removing excess amounts from the soil. This project aims to overexpress the arsenate reductase gene endogenous to *Arabidopsis thaliana* in *Nicotiana benthamiana* in order to induce a capacity in the plant for accumulating and storing arsenic. We used JL36, a tobacco mosaic virus transient expression vector, delivered through the Ti binary plasmid system by inoculation with *Agrobacterium tumefaciens*. Overexpression of the protein could not be definitively confirmed by protein analysis but functional studies may demonstrate that plants that transiently express arsenate reductase could significantly accumulate arsenic.

Robert Kent, University Scholar

Dr. Van H. Pham, mentor

An evaluation of sustainable electricity's role in the economic development of low income countries

This thesis examines sustainable development, and how sustainable electricity can help ensure continued increases in welfare in low-income countries without compromising both the local and global environment. Chapter 1 discusses sustainable economic development and associated concepts, with a particular focus of anthropogenic climate change and adjusted net savings. Chapter 2 presents an overview of energy use in low-income countries and its impacts on development, and proposes sustainable electricity as an important and viable component of any development agenda. Chapter 3 presents a formal definition of sustainable electricity generation as electricity generation that is from a renewable source, imposes no net social costs, and minimizes negative externalities, concluding with an evaluation of four prominent sustainable electricity technologies. In my conclusion, I argue that since sustainable electricity technologies are renewable and frequently least-cost among options, it should be considered a first-best in development policy.

Min Kim, Biochemistry

(with Raj Patel, Biochemistry)

Dr. Sung Kun Kim, mentor

Cloning, Expression, and Purification of APS reductase from Methanocaldococcus jannaschii (Mj0973)

The form of 5'-adenylylsulfate (APS) reductases that are essential for cysteine biosynthesis in bacteria and plants catalyze the formation of sulfite from APS using either glutathione or thioredoxin as electron donors. APS reductases from the bacteria *Pseudomonas aeruginosa* and the green alga *Enteromorpha intestinalis* and the archaeon *Methanocaldococcus jannaschii* were studied. *E. intestinalis* APS reductase (EiAPR) has a bipartite primary structure consisting of a domain with homology to *P. aeruginosa* APS reductase (PaAPR), and C-terminal domain with homology to the redox-active proteins thioredoxin and glutaredoxin. Iron and acid-labile sulfide analysis indicated these enzymes both contain one [4Fe-4S] cluster as a cofactor. Resonance Raman experiments are consistent with the presence of a [4Fe-4S] cluster with only three cysteine ligands. Redox titrations show that the EiAPR contains two disulfide/dithiol pairs with midpoint potential (E_m) values of -290 mV and -140 mV (at pH 7.0), respectively. PaAPR contains only a single disulfide/dithiol cysteine pair with an E_m value at pH 7.0 identical to that observed for the more negative component found in EiAPR. C-terminal domain of EiAPR itself shows an E_m value at pH 7.0 (i.e., -140 mV), consistent with the more positive EiAPR component, which is closer to that of *E. coli* glutaredoxin (i.e., -198 mV) than it is to *E. coli* thoredoxins (i.e., -270 mV). These results suggest that EiAPR has two different disulfide couples; one is like PaAPR and the other (i.e., the C-domain site) may function in a manner similar to a glutaredoxin. The investigation for the archaeon APS reductases is currently underway.

Bart Klaus, Biology

Dr. William Hillis, mentor

Effects of Atrial Natriuretic Peptide on Aldosterone Production in Rat Adrenal Cells

Aldosterone is a hormone that is produced in the adrenal glands and most notably acts upon the retention of sodium ions in the urinary tract. Sodium retention has been linked to water retention that has effects all over the body, including determining blood pressure levels. Defects in function and levels of aldosterone have led to clinical manifestations of Conn's syndrome and primary hyperaldosteronism which have been thought to be contributors to secondary hypertension. Though the major effects of aldosterone are thought to be known, many hormones have many less obvious effects and determinants. In an effort to further understand the workings of this hormone, a culture of rat adrenal cells based on a collagen matrix were grown and introduced to human atrial natriuretic peptide before measuring their aldosterone production to discover if the hormone has an effect on the production of aldosterone by the cells. Though there is little evidence that there is a relationship between the productions of the two hormones, the only way to provide solid evidence one way or the other is to study the relationship by scientific testing. This research will simply test one hormone from a long list of possible effectors in aldosterone function and its effects on the body in an effort to provide a clearer picture of how the production of aldosterone is determined in the body and how this may lead to possible treatments in the future. The resulting data suggests no relationship between the presence of atrial natriuretic peptide and aldosterone production, but this research was necessary in order to explore all reasonable methods of control over aldosterone production.

Kathleen Kong, University Scholar

Dr. Chris Kearney, mentor

Development of a protein expression vector from Virus X

Plant viral vectors can strongly express pharmaceutical and other commercial proteins, but they tend to carry large genes unstably. Moreover, not many species besides the tobacco, *Nicotiana benthamiana*, have reliable viral vectors. With the recent advent of *Agrobacterium*-mediated delivery of viral constructs ("agroinoculation"), plant biotechnologists now have a much faster and more efficient method to achieve high protein expression. We created a Virus X-based agroinoculation and transgenic vector by cloning the whole viral genome into a binary vector driven by a 35S promoter and demonstrated infectivity in tobacco. Furthermore, we eliminated certain genes from the virus DNA to create a deletion vector that is genetically stable and environmentally safe. We are currently constructing an optimized vector to be tested for infectivity in both tobacco and other plants.

Erika Labuzan, Psychology

Dr. Jim H. Patton, mentor

Psychopathy in Women

Most people have heard the term "psychopathic personality," but few are aware of what it actually means. Psychopath is a term used to describe an individual in whom the normal processes of socialization have failed to produce the mechanisms of conscience and habits of law-abidingness that normally constrain antisocial impulses (Murphy, 1976). Hare's operationalization of psychopathy places great emphasis on personality in that 13 out of 20 items assessed on the PCL-R represent standard personality descriptors: glibness, grandiosity, need for stimulation, untruthfulness, manipulativeness, lack of guilt, shallow affect, callousness, poor behavioral control, lack of planning, impulsivity, irresponsibility, and failure to accept responsibility. One must question whether psychopathy has similar genetic and etiological bases as well as presentation in male and female populations. Perhaps it is necessary to create new assessment measures for women that can detect psychopathy with varying presentation. It is also essential to diagnose psychopaths in community, forensic, and psychiatric populations.

David Leverenz, University Scholar

Dr. William Hillis, mentor

The Effect of Serotonin on Aldosterone Secretion in Cultured Rat Adrenal Cells

The purpose of this experiment was to examine the effect of serotonin on aldosterone secretion by cultured rat adrenal cells. To do this, a collagen substrate was prepared from rat tails for tissue culture. A significant difference between this experiment and previous work by students in Dr. Hillis' lab is that the collagen substrate was attached to Petri dishes instead of roller tubes. This modification allowed for whole rat adrenal glands to be cultured for each sample. Overall, 16 adrenal glands from 8 rats were tested. The results showed almost no change in aldosterone secretion due to serotonin stimulation, with stimulated adrenal cells producing an average of 236 pg/ml and unstimulated adrenal cells producing 235 pg/ml. A large standard deviation of these results precluded a more detailed analysis of these results, leading to several conclusions. First, while there was a large amount of variety in the aldosterone concentrations produced by adrenal glands of different rats, there was a positive correlation between that produced by left and right adrenal glands of the same rats (with r-values of 0.47, 1.08, and 0.63 for data set A, unstimulated data set B, and stimulated data set B respectively). Second, there was no apparent correlation between the amount of aldosterone secreted by a particular sample after 24 hours and that secreted by the same gland after 48 hours, regardless of serotonin stimulation. These findings imply that the different tissue culture process used in this experiment introduced new variability into the experimental method. Corrections to this procedure are now possible because of these results.

Melissa Limmer, Journalism--Public Relations

Professor Maxey Parrish and Professor Robert Darden, mentor

Image over Issue: A Study of the Images of Presidential Candidates in the 2008 Election

The 2008 election was nothing if not historical. For the first time an African-American was nominated as a major party presidential candidate and for the first time a woman was featured on the republican ticket for vice president. The diverse images of the candidates, not only in their physical appearance, but also in their personality and character, were never more important or influential than in this past election. This thesis provides a case study of the role public relations practitioners play in shaping the images of candidates in presidential elections, in this case the 2008 presidential election. Three methods of political communication were analyzed: press releases, debates, and new media communication, including blogs, websites, and video.

Mabel Macaden, Psychology

Dr. Wade C. Rowatt, mentor

The Effects of Religious Priming on Prejudice -

All major world religions include teachings regarding love and acceptance of others. Given this knowledge, one could hypothesize that religiosity engenders tolerance. However, research has shown that this is not always the case. This experiment examined the effects of religious priming on self-reported attitudes. A lexical decision task was used to subliminally prime participants with either religious or neutral concepts. The participants were then asked to fill out self-report measures of overt and covert prejudices. Participants who were primed with religious concepts did not describe themselves as racist when overtly asked to rate their attitudes, yet displayed covert prejudices. These results suggest that religiosity does, in fact, have an influence on personal prejudices and perspectives

Steven Mart, Mechanical Engineering

Dr. Stephen McClain, mentor

Heat Transfer from Protuberances and Simulated Ice Accretion Roughness Elements in Laminar Flow

The heat transfer phenomena occurring during the initial phases of in-flight ice formation and accumulation on aircraft surfaces are not completely understood. The aim of this investigation was to quantify the local heat transfer coefficients on surface roughness elements intended to mimic the early stages of ice accretion. In order to achieve this objective, a new technique for mounting gold-deposition Mylar film in a gold-side down orientation was developed and tested. Then, using infrared thermometry to acquire temperature profiles of a gold Mylar heated flat plate prepared with hemispherical spherical roughness elements of varying thermal conductivity, the local heat transfer coefficients of both the perturbed and unperturbed regions were evaluated. This study presents the results of the new Mylar film mounting procedure and the roughness element heat transfer coefficient evaluations.

Jason Milam, University Scholar

Dr. Antonios Augoustakis, mentor

Taking the Joke Seriously: An Interpretation of Juvenal's Tenth Satire

The Juvenalian corpus has long been noted for its particular brand of biting sarcasm and the overwhelming *indignatio* that prompted its production. With specific reference to his tenth Satire, this thesis argues against the prevailing claim that Juvenal's work is devoid of philosophical content. Through a consideration of the poem itself as well as the dominant, negative interpretation of the satire, the author proposes a reading of the work that takes into account the difference between intrinsic and extrinsic goods. Under such an understanding of this philosophical distinction, it is possible to construct a model under which the famous *mens sana in corpore sano* passage may be understood as a true philosophical recommendation made by the poet. This reading also reconciles the poet's sarcastic attitude towards prayer as a means for attaining self-sufficiency and the persona of Democritus with a positive understanding of the final homily.

Landai Nguyen, Biology

Dr. Janelle M. Walter, mentor

Eating Disorders and the Evolution of Their Treatments

Eating disorders belong to a class of disorders that are often misunderstood despite their long-lasting and devastating effects. Contrary to the popular belief that these disorders only affect fashion models and young women who desire to be thin, eating disorder patients also include men and world-class athletes. In my thesis, I will attempt to explain the different types of eating disorders, as well as their symptoms and effects on the patients' physical and emotional states. In addition, I will also discuss the many different options for treating these disorders, although no one treatment can effectively eliminate a particular eating disorder.

Andrew Nordin, Biochemistry

Dr. Sung-Kun Kim, mentor

Purification of Synechocystis sp. PCC6803 slr 1562 Gene Product for Electrochemical Studies

Glutaredoxins are proteins which can be found in all forms of life because of their ability to either reduce or oxidize disulfide bonds in other proteins, making them essential for normal protein function. One such protein is arsenate reductase, an enzyme whose action, in conjunction with a related transporter, is able to effectively detoxify arsenic compounds. This particular study focuses on the arsenate reductase isolated from the cyanobacterium *Synechocystis sp. PCC6803*, which is reduced, and thereby activated, by one of three glutaredoxins designated A, B and C. As Grx A had already been purified and its physical and chemical characteristics studied extensively, this research attempted to purify Grx B, encoded by the slr 1562 gene, for similar purposes. However, when Grx B is overexpressed using standard procedures, it becomes insoluble, clumping together in inclusion bodies. Although Grx B was not purified during this research, the insoluble character of the protein, previously identified in other scientific literature, was verified by gel electrophoresis, and the experimental purification procedures were modified to increase efficacy. Ultimately, study of these proteins and their interactions contains the potential to drastically improve efforts at phytoremediation of environmental arsenic contamination.

Raj Patel, Biochemistry

(with Min Kim, Biochemistry)

Dr. Sung-Kun Kim, mentor

Cloning, Expression, and Purification of APS reductase from Methanocaldococcus jannaschii (Mj0973)

5'-adenylylsulfate (APS) reductases is essential for cysteine biosynthesis in bacteria and plants catalyze the formation of sulfite from APS using either glutathione or thioredoxin. APS reductases from the bacteria *Pseudomonas aeruginosa* (PaAPR) and the green alga *Enteromorpha intestinalis* (EiAPR) and the archaeon *Methanocaldococcus jannaschii* were studied. EiAPR has a bipartite primary structure consisting of a domain with homology to PaAPR, and C-terminal domain with homology to glutaredoxin. Iron and acid-labile sulfide analysis indicated these enzymes both contain one [4Fe-4S] cluster. Resonance Raman experiments confirmed the presence of a [4Fe-4S] cluster. Redox titrations show that the EiAPR contains two disulfide/dithiol pairs with midpoint potential (Em) values of -290 mV and -140 mV, respectively. PaAPR contains only a single disulfide/dithiol cysteine pair with an Em value identical to that observed for the more negative component found in EiAPR. C-terminal domain of EiAPR itself shows an Em value (i.e., -140 mV), consistent with the more positive EiAPR component, which is closer to that of *E. coli* glutaredoxin (i.e., -198 mV) than it is to *E. coli* thioredoxins (i.e., -270 mV). These results suggest that EiAPR has two different disulfide couples; one is like PaAPR and the other (i.e., the C-domain site) may function in a manner similar to a glutaredoxin.

Ian Perry, History

Dr. Daniel H. Williams, mentor

Figurative and Literal Interpretation in Origen

In this Thesis I will investigate Origen's use of non-literal interpretation and see how it relates to his exegesis of the Old and New Testaments. I intend to discuss the difference between non-literal interpretation that is built on top of a literal sense which the interpreter accepts as valuable and true and non-literal interpretation which actually replaces the literal sense. I intend to identify instances of both types of non-literal interpretation in Origen's writing, and then discuss whether or not these different sorts of interpretation can be found in his analysis of both the Old and the New Testaments. In the first chapter I desire to provide a general overview of the different types of interpretation used by Origen and his motivations for employing these different types of interpretation. In the second chapter I continue the discussion of different types of interpretation by comparing his interpretation of specific passages from the Old and New Testaments. In the third chapter I want to look at a specific topic and look at the exegetical resources Origen brings to bear on it (to see how he brings together his use of different biblical verses in order to discuss a specific point). In the final chapter I intend to discuss what differences and similarities there are between Origen and selected other writers, given what has been learned about his approach.

William Perry, University Scholar

Dr. James SoRelle, mentor

Eisenhower and Sputnik: An Analysis of Eisenhower's Response to Sputnik and Its Contribution to the Creation and Propagation of the Military-Industrial Complex

Eisenhower has long been blamed for fear and concern that surrounded the Soviet launching of Sputnik. It has been called a failure of his governing strategy; the hidden hand. Many have linked this failure to the creation and propagation of the Military-Industrial Complex that Eisenhower warned against in his Farewell Address. This thesis will explore the validity of these claims using both primary and secondary sources. The initial two chapters will provide a historiographical and historical background to Sputnik, while the final three chapters will analyze America's, especially Eisenhower's, response to the satellite. This thesis intends to show that while Eisenhower deserves blame for the creation of the Military-Industrial Complex because he could not calm the American public, he is not completely at fault as many suggest. The Democrats in Congress and the media kindled public concern over the nation's safety for their own gains and, in so doing, they also contributed to the formation of the Military-Industrial Complex.

Noah Peterson, English

Dr. D. Thomas Hanks, Jr., mentor

"No mercy, but mortall warre": Familial Violence in Sir Thomas Malory's Le Morte Darthur"

Most modern interpretations of the legends surrounding King Arthur can be traced to Sir Thomas Malory's fifteenth century prose epic, *Le Morte Darthur*. Malory fills his story with large, expansive families. These families battle other families, but there is also a copious amount of conflict within the families themselves. This theme has been largely ignored by scholars. This thesis examines the theme of familial violence within the *Morte Darthur*. The violence between family members is inherent in the system of gaining and maintaining honor, shown as a similar element in both King Arthur and King Mark's courts, and highlighted by Malory's use of an envelope structure. The inescapable violence between family members is one of the many elements that work together to lead to the fall of the round table and the death of Arthur.

Ariana Phillips, Piano Pedagogy

Dr. Robin Wallace, mentor

"Guns Buried in Flowers": Chopin and the Musical Sublime

The sublime is an aesthetic concept commonly applied to music by Handel, Haydn, Mozart and especially Beethoven during the late-18th and early-19th centuries. This research traces the development of the sublime in music and philosophy in order to determine criteria for musical sublimity. Analysis of the A minor Prelude, Op. 28, no. 2, the B minor Scherzo, Op. 20, and the B-flat minor Sonata, Op. 35, reveals that these works utilize some of the sublime gestures found in earlier works and evoke the same types of reactions from audiences. The last chapter examines three performances of the Sonata in B-flat minor to discover how a performer may enhance sublimity through interpretation. Based upon this evidence, this thesis argues that although Chopin's works do not exhibit all of the traditional aspects of the sublime, their complexity and profundity render them equally as sublime as those of Handel or Beethoven.

Aaron Reynolds, French and International Studies

Dr. Sinda Vanderpool, mentor

La Présence de la Religion dans la Littérature Française du XIXème Siècle. ((The Presence of Religion in 19th Century French Literature))

The French Revolution had obvious and significant impacts on French society, culture, and political organization, including reducing the role that the Roman Catholic Church played in both politics and expression of faith.

Although the events of the last decade of the 18th century significantly altered and diminished the relationship between the French government and the established Church, the Revolution did not destroy all sense of religion and spirituality in France; the presence of religious themes in significant works of 19th century French literature prove otherwise. This thesis first identifies the course that French Christianity took from its early beginnings until the Revolution. The second chapter identifies religious themes in the life and works of François-René de Chateaubriand. The third chapter looks at the poetry of Victor Hugo, both before and after his political exile, and tracks his own evolution concerning religion and spirituality. The fourth chapter is devoted to the identification of religious themes in selected examples of Hugo's major works of prose.

Megan Rizos, University Scholar

Dr. Kathy Whipple, mentor

The Influence of Music on Secondary Language Acquisition

The true influence of music on an individual has always been and still remains largely a mystery. Expecting mothers expose their unborn children to classical music in the hopes of raising the child's IQ; caregivers in hospitals play music for their patients in the hopes of lowering their blood pressure; any given person on the street can hear songs that they have not heard in over a decade and can still recite them with perfect accuracy. My thesis attempts to debunk some of the mystery of musical influences, specifically on music as it relates to secondary language acquisition. The real question is do musicians have an advantage over nonmusicians in acquiring secondary languages due to their superior auditory sensitivity? Does gender play a role, or dexterity? How long would one have to play to acquire the advantage? My survey-based thesis addresses these questions and provides answers derived from 138 case studies.

Chris Rose, English

Dr. Joe B. Fulton, mentor

Mark Twain and the Jury System

Drawing on Twain's letters, newspaper articles, and recent scholarship, this thesis concerns the trial scenes in *Roughing It* (1872), *The Adventures of Tom Sawyer* (1872), *Pudd'nhead Wilson* (1894), *Those Extraordinary Twins* (1894), and *Personal Recollections of Joan of Arc* (1896). *Roughing It* concerns the author's western years from 1861-67 where his views of the outlaw style of gun-slinging justice replaces any hope he has for the inadequate American jury system. In *Tom Sawyer* the western outlaw tradition, represented by Tom Sawyer, becomes the lone executor of justice against the criminal Injun Joe. *Pudd'nhead Wilson* and *Those Extraordinary Twins* reveals a dramatic shift concerning his view of the courtroom as both the jury system and the individual (David Wilson) are unable to reach any notion of justice. *Pudd'nhead Wilson* is an analogy for the then ongoing *Plessy v. Ferguson* trial, and the book reveals the direction that America was heading that led to the Supreme Court decision in *Plessy* which allowed for legalized segregation. In *Joan of Arc*, Twain uses the story of Joan's trial and martyrdom that dominates the latter third of the novel to show the depravity and hopelessness of the human condition in general. By examining the procession of Twain's trial scenes chronologically, the reader can view Twain's pessimism not just for the jury system's ability to deliver justice, but the ability for humankind to seek justice amongst itself in any form.

Brian Rundle, Psychology

Dr. Jim H. Patton, mentor

Consciousness, Evolution, and Art

Abstract: This thesis briefly looks at the phenomenon of human consciousness, while addressing philosophical issues, its causes, and its implications. Evolution is the reason that human beings are the way we are today, but how are things like art accounted for in the evolutionary process of human development? This thesis looks to one of the great minds in philosophy and psychology, Carl Jung, in order to examine the implications the evolution of human consciousness has for art, specifically its causes, its purpose, and its emotive impact on observers.

Mary Claire Russell, University Scholar

Dr. Alden Smith, mentor

Selected Intertexts in Augustine's Confessions and Virgil's Aeneid

Dante was not the first to note Virgil's relationship to Christianity. He was within a longstanding tradition. Nearly one thousand years before Dante and four hundred years after Virgil, St. Augustine of Hippo picked up this same thread, asking a question similar to that of Dante: If the pilgrim in *Confessions* is an example of a man's journey toward a conversion to Christianity, how does Virgil's hero, Aeneas, provide a foundation for understanding the Christian hero's journey? Just as Paul used his Roman knowledge as a platform to bring the Gentiles into understanding of Christian teaching, so Augustine uses his knowledge of Virgilian narrative to do the same. George Herbert wrote, "people by what they understand are best led to what they understand not." Understanding the way Virgil influenced Augustine and the way Augustine uses Virgil's work is essential to understanding Augustine's writing.

Chelsea Saylor, University Scholar

Dr. David Nichols, mentor

Wyatt Earp as Secretary of State: Western Films as an Expression of American Identity and Political Thought, 1946-1993

Western films have perhaps the greatest effect on American political identity, due to the fact that the Western myth itself is foundational to the national identity. No one remains to give a firsthand account of the journey west, but the story is woven into the fabric of American identity. While most Americans will never experience the West for themselves, they have been exposed to the stories since childhood. First, I present the development of the Western film genre, arranging films into specific categories based on their narrative structure. I then argue that the Western myth is the American national myth, drawing on the nature of myth and the importance of the West in American history. Finally, I consider two specific case studies, one on *My Darling Clementine* and the other on *Tombstone*, to represent the political relevance of Westerns and their effect on American political thought and identity.

Brock Scheller, University Scholar

Dr. Thomas Hibbs, mentor

"Mixing Memory and Desire": Nietzsche and Eliot on Modernity and Diagnostic Myth

This thesis explores the similar projects articulated in the earliest works of Friedrich Nietzsche, most especially in his first book *The Birth of Tragedy* and one of the *Untimely Meditations*, "On the Uses and Disadvantages of History for Life," and in the greatest poetic accomplishment of T.S. Eliot's early period, *The Waste Land*. The first section reveals Nietzsche's project of cultural renewal for a Germany which has suffered from the progressive abstraction and optimism of the Enlightenment. He envisions a mythic-aesthetic solution which at once diagnoses modern desiccating tendencies and helps to restore culture to unity and health. The second section demonstrates that T.S. Eliot's poem *The Waste Land* can be fruitfully read as an instance of this early Nietzschean project, especially upon considering its diagnosis of the modern condition and its simultaneous potential restoration of culture through myth. The conclusion considers the limited success of these projects.

Ashleigh Schulwitz, Psychology

Dr. JoAnn C. Tsang, mentor

The Effect of Religious Orientation on Self-Reported and Behavioral Gratitude

The relationship between intrinsic, extrinsic, and quest religious orientations and gratitude was tested using an implicit religious prime and both behavioral and self-report measures of gratitude. 81 female undergraduates were randomly assigned to either a Favor or Chance condition, and Religious prime or Control prime condition. Participants in the Favor condition were given \$9 by another (fictitious) participant, while participants in the Chance condition received the same amount by chance. Participants had the opportunity to distribute money to their distribution partner, and self-report measures of gratitude were taken throughout the study. Religious orientation was measured using the Religious Orientation scale (Allport & Ross, 1967) and the Quest scale (Batson & Schoenrade, 1991). While results did not show a significant relationship between religious orientation and gratitude, religiously primed participants and participants in the Favor condition distributed more money to their distribution partner compared to participants in the Control prime and Chance conditions.

Greg Stecker, University Scholar

Dr. James Marcum, mentor

Euthanasia and terminal lung cancer patients: Ethical issues

Medical ethics abounds in controversies. Most often these controversies center around philosophical debates; however, medicine is never independent of humanity. In this thesis, I examine the ethical issues associated with euthanasia in medical practice while focusing on the human experience. To this end, lung cancer was chosen as the representative of a disease from which those patients who suffer from it often elect euthanasia. After examining the experience of those with lung cancer, I use Beauchamp and Childress's bioethical principles as one of the most popular (if not the most popular) medical ethics systems to evaluate the morality of euthanasia in medicine. As sources for this project I used Beauchamp and Childress's book *Principles of Biomedical Ethics*, various journal articles from oncology and ethics journals, as well as patient stories of personal experiences with lung cancer. The thesis begins by discussing the history of this topic and its relevance to medicine. The second chapter then discusses lung cancer from a physiological perspective. The third chapter bridges the gap between physiology and philosophy, by discussing the experiences and values of patients who suffer from lung cancer. Finally, the fourth chapter evaluates euthanasia using Beauchamp and Childress's bioethical principles vis-à-vis the previous discussion of patient experiences. From this analysis, euthanasia is ethically permissible in some circumstances when evaluated using Beauchamp and Childress's system. To be morally permissible, euthanasia must be performed within the medical system even though this poses a dilemma for medicine as euthanasia could undermine the principles that establish it as an ethically permissible practice.

Jordan Stouffer, Biology

Dr. William D. Hillis, mentor

The Effects of K^+ on the Aldosterone Production of in vitro Rat Adrenal Cells

Aldosterone is a hormone produced by the adrenal glands responsible for the regulation of the body's salt balance and is consequently a key factor in determining blood pressure. It is widely known and accepted that a high plasma concentration of potassium stimulates aldosterone's production. However, it is less known whether potassium is capable of eliciting the same response in isolated adrenal tissue. This research attempts to clearly define the responsiveness of the adrenal glands' genesis of aldosterone to extracellular potassium using an in vitro model that closely simulates the in vivo environment of adrenal tissue.

Tamara Strohm, Biology

Dr. Darrell S. Vodopich, mentor

The Effects of Gregarine Parasites on Egg Production in Five Dragonfly Species

Parasitism affects all taxa and influences individual and population success. Odonates are active predators and subject to a variety of both ecto and endoparasites, most of which are expected to have a negative impact on the fitness of their hosts. Gregarine parasites in the phylum Apicomplexa infect the digestive tract of a variety of invertebrates. It is unknown if they negatively impact their dragonfly hosts. This research seeks to determine if gregarine parasites reduce the reproductive success of adult dragonflies, using egg production as a measure of fitness. Five species of dragonflies were collected from Battle Lake, TX (N31°32.43006, W096°53.84364) in 2008. Females were artificially induced to oviposit in the field and eggs were counted. Results indicated a positive correlation between parasite load and number of eggs from forced oviposition for *Erythemis simplicicollis* only. I concluded that the presence of gregarine parasites does affect fitness by egg production.

Sarah Swinney, Museum Studies and History

Dr. Keith A. Francis, mentor

Knights of the Quill: The Arts of the Eglinton Tournament

The Earl of Eglinton's 1839 medieval-style tournament appeared in and served as a model for a variety of literary and artistic works during the nineteenth century. Scholars have often identified the Eglinton Tournament as an example of Victorian medievalism, but few have examined the event at length, and there has never been a comprehensive analysis of its influence on the arts in the Victorian period. After an introduction describing the event, this thesis examines the available sources of information about the Tournament, the literature which contributed to its formation, and the artistic and literary works which it subsequently influenced. Such works include poetry, fiction, drama, music, paintings, and decorative arts. These are useful for understanding the Tournament and the Victorian perception of the Middle Ages.

Collin Talhelm, University Scholar

Dr. Richard Duhrkopf, mentor

Parasitic Species of the Anopheles Mosquito Host

Only recently, scientists have begun to recognize the relationship between various mosquito species and the particular parasites that prey on them. By following the evolutionary jumps from mosquito to mosquito, we could gain a better understanding of how such changes occur and hopefully apply such information to controlling the spread of malaria, a very well-known and dangerous parasitic infection. Although my own research is currently on hold, I would like to focus efforts on the several different Anopheline species present in Texas to develop a speciation map of their associated parasites. Such methods involved would include identification based on physiological differences and possible genetic variances, if such information is available. Future research would most likely need to be focused upon the mechanisms involved in parasitic branching.

Alex Taylor, Psychology

Dr. Joseph Achor, mentor

Music and the Mind: How Music Shapes Our Reality

The effect of music on our society and on the individuals in it is intuitive. We see it across our campus, as students retreat into their private worlds, aided by the latest version of the iPod and (often intrusively) blast their beats from their car speakers. But what do we concretely know about this human obsession and the way it affects the individual? I hope to gain some insight into this question by examining three domains where music has the potential to have a large influence; healing, faith, and entertainment. To do this I searched several psychological and medical journals in order to review what the experts have found to be the mechanisms of this profound shaper of our personal reality.

Paige Tucker, Political Science

Dr. Jennifer Good, mentor

German Immigration in the 20th and 21st Centuries

The combination of a growing foreign resident population, comprising nearly ten percent of the total German population, with a declining birthrate among ethnic Germans at the close of the twentieth century led to the implementation of two major immigration reforms in 2000 and 2005, which provide a definite break from many of the immigration policies of the previous century. In order to examine the effect likely to be had by these two laws, this thesis first analyzes the primary laws and immigration movements of the twentieth century, and then analyzes in detail the specifications and immediate effects of the Citizenship Act of 2000 and the Immigration Act of 2005. To further analyze the effectiveness of these two reforms, the growing attention given to issues of migration and citizenship on the European Union level is discussed. Ultimately, the reforms of 2000 and 2005 represent a positive step in the progression of German immigration law, but further actions will need to be taken to match anticipated actions by the European Union and to attract immigrants in sufficient numbers to mitigate the effects of population decline.

Joseph Vale, Political Science

Dr. Victor J. Hinojosa, mentor

Born Or Raised? Comparing American and French Birthright Citizenship Policy

The United States is currently the only developed country in the world to utilize simple jus soli. This project makes a comparative analysis between the United States and France in order to explain why the United adheres to its unique policy. France was the first country in Europe to reject simple jus soli, and some scholars argue that French nationality policy has led trends in European nationality policies since then. Like the United States, France also experienced a revolution based on republican ideas. This project uses historical analysis to identify factors that allowed France and the United States to follow different paths after their respective revolutions. This analysis helps explain why the United States continues to adhere to a unique policy.

Michael Villarreal, Neuroscience

Dr. Jim H. Patton, mentor

Ethical Considerations of Cognitive Enhancement Medications: Adderall and Ritalin

The twenty-first century has seen numerous intriguing advances in neuroscience, particularly in the development of novel, more specific medications for neurological illnesses. Two of the most commonly-prescribed medications specifically used to treat attention deficit hyperactivity disorder are Adderall and Ritalin. Along with their widespread and intended use in treating neurological deficits, however, comes their illicit use by drug abusers. Through journal articles discussing the pharmacokinetics of both medications and books discussing the ethics of using these drugs to enhance cognitive abilities, this thesis discusses the ethical dilemmas currently faced by physicians and patients alike. This ethical review, which includes a description of the physiological and psychological actions of both Adderall and Ritalin, provides a firm foundation of knowledge upon which an argument may be made for or against the prescription of these drugs as cognitive enhancers.

Carrie Wallis, History

Dr. Barry Hankins, mentor

Civil Religion in Wartime: The Religious Rhetoric of Woodrow Wilson and Franklin Roosevelt

Woodrow Wilson's decision to lead America into war in 1917 and Franklin Roosevelt's decision to once again enter into a worldwide conflict in 1941 were influenced by an assortment of factors. Religion stood as a strong factor of persuasion for both presidents as well as the American public. This thesis will analyze the motivations and implications of the religious rhetoric used by Wilson and Roosevelt in their wartime speeches. Their public addresses from three distinct periods will be included and analyzed: the war years preceding American involvement, the decision to go to war, and the years during American participation in the war. Despite the different political policies that developed throughout these years, the religious rhetoric of both Wilson and Roosevelt remained remarkably constant. For Wilson, religious precepts were central to all thought and action, and thus he regularly used his political policy to support his religious beliefs. In contrast, Roosevelt held the nation as the ultimate authority, often using religious beliefs to support his political policy. Through their employment of such moral language, Wilson and Roosevelt offered strength and guidance to a weary nation.

Meagan Walters, Psychology

Dr. Gary Elkins, mentor

A Tale of Two Scales: Irrational Ideation as a Precursor to Depression

Since the development of Rational Emotive-Behavior Therapy (REBT), irrational beliefs have been a core component in understanding mood disorders. This thesis aims to investigate the presence of an association between a psychological measure of irrational beliefs and depression. Three hundred and one young adults were assessed for irrational thoughts based on the McDonald Irrational Value Scale (IVS) and for depression according to the Center for Epidemiologic Studies Depression Scale (CES-D). One visual analog that assessed relationship satisfaction was also included. In accordance with current cognitive behavior theories, the existence of a correlation was hypothesized. Per our findings, $r = .281$ representing that a small yet significant correlation was detected at a $< .05$ level. Essentially, the interaction linking irrational thought patterns to depression must remain a research area of interest in order to provide the most efficient treatment to the sufferers of emotional disorders. Implications of these results are addressed along with projected courses for future research in this area.

Connie Wang, Baylor Business Fellows

Dr. James Henderson, mentor

The Effect of Ambulatory Surgery Centers on General Hospital Uncompensated Care

With the number of ambulatory surgery centers rapidly increasing, general hospitals face increasing competition for their insured and profitable patients. This study focuses on the question: does the presence of ASCs in the market affect the burden of uncompensated care on a general hospital. Using data from the Texas DSHS, THHSC, and the US Census Bureau, we estimate cross-sectional and county fixed-effects models for all Texas general hospitals for the years 2000 and 2006; the models are estimated for uncompensated care as a percentage of gross patient revenue. We find that the number of ASCs does not have a statistically significant effect on general hospital levels of uncompensated care as a percentage of revenue. These results, which were consistent across several different modeling approaches, could imply that the general concern about ASCs is overstated and that the burden of uncompensated care is determined by other factors such as demographic information and market conditions.

Gregg Wendorf, Biology

Dr. Myeongwoo Lee, mentor

Characterization of ETS domain transcription factor encoding gene lin-1 on fertility and vulval development in Caenorhabditis elegans

One of the largest families of transcription factors is the ETS family. This group includes nuclear phosphoproteins that are involved primarily in cell proliferation and differentiation and are often targets of intricate signaling pathways. One particular gene, *lin-1*, is induced by Ras-Raf-MEK-MAPK signaling to determine multiple cell fates by encoding for one such ETS transcription factor. RNA mediated interference of gene expression (RNAi) experiments were utilized to observe the effects of this gene on the developing nematode, with particular emphasis placed on documenting the effects on fertility. Background information about *C. elegans* will be provided along with descriptions of the materials and methods used and a discussion of the results. The *lin-1* gene appears to play a significant role in *C. elegans* fertility and these experiments were designed to study these effects.

LT Whitley, Psychology

Dr. Jim H. Patton, mentor

The History and Evolution of the Insanity Defense Since Antiquity

The criminal defense now known as the insanity plea was first implemented over two thousand years ago in ancient Greece. The Insanity Defense has historically been an evolving doctrine. Since its formal establishment in the Criminal Lunatics Act of 1800, the defense has undergone a series of radical reforms, spanning various governments, most notably England and the United States. Major trials such as Earl Ferrers, Daniel McNaughten, and John Hinckley Jr. have all sparked reforms that have impacted legislation for several subsequent decades. Past legislation has focused on changing different stages in the legal process, as well as affecting the role and influence of the medical expert witness. Standards have shifted from the M'Naghten, to the irresistible impulse, to the Durham, to the ALI standard, and then back to a revised M'Naghten. The surge of insanity reforms that resulted from John Hinckley's acquittal in 1982 has yet to be equaled in American history. However, with the rise of scientific capabilities and daily medical advances, a revolutionary legal/medical model has emerged. Recent research suggests that there is a genetic predisposition for inheriting major mental disorders, which are further linked to adult criminality. The criminal court system has yet to issue another significant reform for insanity defense, but the time may be close at hand. This paper explores the historical impact of such reforms in both the legal and psychiatric communities.

Brittany Williams, Finance

Dr. Scott Cunningham, mentor

African-American health behavior and outcomes as correlated with knowledge of the Tuskegee Syphilis Experiment

African-Americans have significant disparities in health outcomes in comparison to whites. Theories suggest that these poor health outcomes are associated with African-Americans' general distrust of government institutions, such as physicians and hospitals. Several epidemiologists and other academicians interested in the matter have pointed to the Tuskegee Syphilis Experiment to explain the breach of trust within the African-American community. From 1932 to 1972, the United States Public Health Service researched the effects of untreated syphilis in African-American males. This study, known as the Tuskegee Syphilis Experiment, gained notoriety once the details of the research were made public on July 25, 1972. Using data from the Integrated Health Interview Series, this thesis is designed to test whether knowledge of the Tuskegee Syphilis Experiment affected African-Americans' health behaviors, and consequently, their overall health outcomes.

Ashley Williams, Classics

Dr. Alden Smith, mentor

True Place Names: Toponyms and Topography in Catullus

In the one hundred sixteen poems that comprise the extant corpus of the Neoteric Roman poet Catullus, geographical names appear over two hundred times, thus providing an important angle from which to analyze Catullan poetry. In this thesis I first identify and categorize the different methods by which Catullus employs place names and their various intended effects, then suggest that these individual effects have an impact on several of the larger themes that emerge in Catullus' poetry. I explore how Catullus' use of place names relates to his portrayal of the personal relationships he describes in his poetry, with particular attention to his use of names derived from toponyms.

OTHER SPRING 2009 GRADUATES

Genevieve Alvarado, Neuroscience

Dr. Charles Weaver, mentor

Justin Elms, University Scholar

Professor Christopher Hansen, mentor

Christelle Harvie, Finance and International Business

Dr. Soku Byoun, mentor

Divya Nandamudi, Biology

Dr. William Hillis, mentor

Alex Park, Biology

Dr. Myeongwoo Lee, mentor

David Philpot, Biochemistry

Dr. Matthew Stanford, mentor

Baptist Pastors' Perception of Mental Illness

Chad Richards, Chemistry

Dr. Sarah Jane Murray, mentor

Manoj Thangam, University Scholar

Dr. William Hillis, mentor

Crystal Thomas, Biology

Dr. Michael Attas, mentor

Mayra Varella, Political Science

Dr. Rady Roldan-Figueroa, mentor

Matt Winter, Economics

Dr. H. Stephen Gardner & Dr. David Clinton, mentor

Helen Wojciechowski, Biology

Dr. Myeongwoo Lee, mentor

SUMMER AND FALL 2009 GRADUATES

Omar Butt, Neuroscience

Dr. N. Bradley Keele, mentor

Neurobiological Correlates of General Intelligence

The construct of a general factor of intelligence presumes that there is a single, unitary phenomenon fundamentally involved in all cognitive tasks. Though a controversial area of research, g has been well-supported by psychometricians over the last century, and remains a prominent theory in intelligence research. However, only in the last few decades have neuroimaging techniques allowed for g to be probed precisely in the human brain. Can such an overarching concept be rendered in tangible, concrete terms? If so, does g correlate structurally to certain regions of the brain, or functionally to specific physiological processes that occur within the brain?

Audrey Campbell, Medical Humanities

Dr. Troy Abell, mentor

Should children be screened for cerebral arteriovenous malformations (BAVM)? A cost and formal decision analysis on strokes and deaths averted

Given the present literature, the scientific community knows the prevalence of AVMs within a population, the hemorrhage rates at a specific age, grade, presentation etc, the available diagnostic methods and their affiliated efficacies. Physicians and researchers have conducted observational studies to assess and confirm these statistics, branching into areas addressing the best surgical interventions, resulting surgical disabilities, financial costs per procedure, and the natural history given conservative approaches. The literature is robust in those regards. Here lies the gap: we do not know if screening or any other preventive measure would be beneficial or time-effective given the risk of intervention and associated monetary costs. Conducting a formal decision analysis would refute or confirm the hypothesis stated above, contributing to the medical community and establishing a foundation for further research into preventing deaths and strokes from BAVMs.

Karie Epley, Anthropology

Dr. Garrett Cook, mentor

Examining Polygyny: A Cross Cultural Comparison and Examination of the Fundamental Church of latter Day Saints

Polygyny is the most common marriage form that occurs cross culturally. This thesis will establish a basic background of polygyny both theoretically and anthropologically, as demonstrated specifically in the African cultures that practice polygyny today. Using this theoretical model, which has an economic focus, the Fundamental Church of Latter Day Saints will be examined. Both the historical precedent of polygyny and the current form of polygyny within the church will be examined. By comparing African polygynous societies with the fundamentalist Mormon culture, it can be seen that the current fundamentalist culture does not completely fit the model. Instead of polygyny offering economic benefits, there seems to be a spiritual economic benefit that polygyny presents to the Fundamental Church of Latter Day Saints.

Rabia Shafiq, Biology

Dr. David Eldridge, mentor

Herbal Treatments vs. Pharmaceuticals

My thesis is currently centered on comparing and contrasting the benefits and adverse effects of utilizing herbal treatments vs. pharmaceuticals. It focuses heavily on the toxicity that can arise due to use of medicinal plants and the adverse effects that can arise when using pharmaceuticals to treat ailments. The first chapter focuses on herbal remedies, the second will focus on pharmaceuticals, and the third will compare specific herbs and their medical counterparts.

Laura Weseman, Neuroscience

Dr. Charles Weaver, mentor

Gesture as thought: How spontaneous, non-symbolic gesticulations facilitate language production

Language and gesture are inextricably linked. Gesture develops concurrently with language acquisition in children, and most gesture occurs exclusively in the context of speech. An easily observable function of gesture is facilitation of listener comprehension. When pointing or indicating the physical properties of an object or pictorially mimicking the semantic contents of speech, gesture presents auxiliary information to a listener. But speakers gesture in the absence of a visible listener and, in some experiments, congenitally blind people gesture at the same rate as normal participants even when speaking with other blind people, suggesting that gesture is more than just accessory. Focusing on the spontaneous, non-symbolic gestures that accompany speech and drawing evidence from the neural mechanisms that underlie the connection between language and motor action, this thesis considers how gesticulation facilitates language production. I argue that gesture is a physical embodiment of the thought processes that lead to spoken language. I then consider the implications these findings have for the treatment of language-loss disorders.