

**ABSTRACTS OF
THESIS PROJECTS**

SPRING 2015

BAYLOR HONORS COLLEGE

The Honors Program

University Scholars



BAYLOR
UNIVERSITY

HONORS THESIS ABSTRACTS

2015 GRADUATES

Torie Nicole Abbott, Journalism

Sara Stone, mentor

Freedom or Safety: An Examination of the First Amendment and National Security

The 1970's were a decade full of change and controversy. Daniel Ellsberg singlehandedly led one of the most controversial acts of the decade with his work stealing, copying and distributing the Pentagon Papers. His acts posed an important question to the American people. When it comes to national security or upholding the First Amendment of the United States Constitution, which will prevail? Ellsberg is just an example of a problem that remains relevant today with individuals such as Edward Snowden. Although the importance of national security is irrefutable, for journalists, and Americans collectively, maintaining the First Amendment, and the freedoms explicitly listed within said amendment, is utterly imperative. Nonetheless, I agree in favor of upholding the first amendment through arguing and analyzing both sides of the debate.

Hannah Adams, University Scholar

Alden Smith, mentor

The Rhetoric of Persuasion: Cicero, Archias, and the Defense of the Liberal Arts

Cicero's defense of his teacher, the Pro Archia, is far from the expert orator's most well-known work, yet it presents fascinating questions for analysis. Archias's Roman citizenship has been called into question, and through an artful display of oratory and rhetoric, Cicero reconstructs the reality of Archias's life and contributions to provide proof of his worth as a citizen. The speech then comes to stand as proof of Archias's great teaching, as Cicero's exceptional command of language and rhetoric illustrates his teacher's vast influence. Although technically delivered in a court of law, the speech possesses the unique characteristics of a more ornamental realm of oratory, epideictic, which includes speeches such as funeral orations, or laudatio funebris. It could even be read as a sort of laudatio funebris for Archias, Cicero, and liberal learning. The Pro Archia, then, is an oration with a complex network of layered meaning with broad cultural implications both for Cicero's audience and for readers today.

Bradley Aldridge, Applied Mathematics

Rosalie Beck, mentor

Early Theological and Historical Influences on the Doctrines of James Robinson Graves

As the Southern Baptist Convention of the mid-19th-century continued its tug-of-war over membership and churches with the Stone-Campbell Restoration movement, James Robinson Graves founded the Landmark movement at a meeting in Cotton Grove, Tennessee in order to rejuvenate the Baptist sense of theological identity. The firebrand minister and editor of the *Tennessee Baptist* prescribed strict boundaries to Baptist ecclesiology, including a definition for "legitimate" baptism and the restriction of the church to a local and visible nature, to the exclusion of the universal church and centralized missions. To carry his argument, Graves cited both Scripture and a theory of "historical succession" that linked the New Testament church to contemporary Baptists using a theological chain that included medieval heretics. This thesis examines the preacher's life and career prior to Graves's Cotton Grove Resolutions of 1851 and the sudden rise of Landmarkism that followed. In doing so, this thesis attempts to explain why Graves developed the Landmark theology contained in the resolutions. This thesis argues that while the essence of Graves's doctrines evolved from that of the Separate Baptists of Graves's New England birthplace, Landmarkism's exclusionary character arose from Graves's observations of the effects of the Stone-Campbell movement and the liberalization of mainstream ecclesiology on Southern Baptist life.

Claire Allen, Social Work

Sarah Walden, mentor

Give Bread, Give Life

Since its beginnings, the church has sought to provide food. Looking at different points of history and methods of provision, this thesis explores the ways that congregations serve food to their members and neighbors. A research study is proposed to measure the effectiveness of food provision by churches. In a time in America when approximately 15.8 million children live in food-insecure households, the church may hold viable solutions in their means and will to help.

Berenice Andaluz Ruiz, Baylor Business Fellow

Michael Boerm, mentor

Joseph Gallieni: Pacifying Tonkin and Providing the Base for Imperial Success in French Indochina

French presence in Indochina can be traced back as far as the 16th century when European missionaries first traveled to South East Asia. The formal colonization effort began with the protectorate of Cambodia in 1863 and came to completion with the pacification of Tonkin in 1894. The path to achieving colonial rule was characterized by constant opposition from competing Chinese forces who had cultural and economic advantages over the foreign European power. This thesis examines the pivotal role of the French colonel Joseph Gallieni in Tonkin from his arrival in 1892 to his departure in 1896 by studying his accounts in both the French Sudan and French Indochina. To complement Gallieni's works, I will also utilize travel and geography journal publications that aid in understanding the wealth of the colony as well as political publications describing the benefits and concerns with colonization. Through this research I establish that Gallieni's time in Africa and his strategic incorporation of native forces allowed for success in acquiring a region rich in political and economic significance. It was with this victory that France established the foundation required to continue expansion in Indochina.

L. Nicole Arellano, Geology

Daniel J. Peppe, mentor

Using Paleosols to Reconstruct the Paleoenvironment and Paleoclimate of a Late Pleistocene Archaeological Site in the Lake Victoria Basin, Kenya

Lake Victoria has expanded and contracted throughout time in response to climate change, but little data are available prior to the Last Glacial Maximum during this important interval in human evolution when modern humans dispersed from equatorial East Africa. This study uses paleopedology to reconstruct the paleoenvironment during the Late Pleistocene and focuses on three paleosols from Kisaaka, a site near Karungu, Kenya along the eastern margin of Lake Victoria. The oldest is a paleo-Vertisol, overlain by two paleo-Inceptisols. Bulk and clay mineralogy indicate that smectite dominates the paleosols. Bulk geochemistry of the paleosols was used to understand weathering and estimate mean annual precipitation (MAP) of ~700 to 900 mm/yr using the CALMAG and CIA-K weathering indices. Field observations, mineralogy, and MAP estimates from Kisaaka paleosols suggests a seasonally dry, open grassland environment during the Late Pleistocene that is different from the historic closed bushland and forest habitats.

Kelsey Bell, University Scholar

Meghan DiLuzio, mentor

Holy Ground: The Use of Sacred Space in Hellenistic, Roman, and Christian Religious Sites

My thesis investigates the use of sacred space in the Greco-Roman and early Christian religious traditions. I argue that there was a mutually reinforcing relationship between religious beliefs and practices on the one hand, and the structure of ritual space on the other. Rituals and beliefs determined the size and shape of environment in which worshippers approached the holy, and this in turn influenced their experiences and beliefs. The thesis is organized as a series of four case studies. Chapter one examines the Hellenistic Temple of Apollo at Didyma in Asia Minor. In this chapter, I explore the ways in which oracular activities at the site contributed to the temple's unique architectural features. Furthermore, I argue that these very features supported the validity of the oracle by creating a spiritually charged atmosphere. In chapter two, I turn to Rome and to the Temple of Castor and Pollux in the Roman Forum, investigating how the establishment of this site as a memorial of an important battle in Roman history paved the way for this sacred space to perform important political functions as well as religious. Finally, in chapter three, I explore two early Christian sites built over the tombs of saints: the basilica of Sant'Agnese Fuori le Mura and the basilica of San Lorenzo Fuori le Mura. I argue that the Christian veneration of saints and the localization of the holy led to the development of closely related basilica and martyrium complexes.

Matthew Blair, University Scholar

David Ryden, mentor

Points and Spheres: the Innovative Cosmology of Dante's Divine Comedy

My thesis analyzes the cosmology of Dante's *Divine Comedy*, with particular focus on the ways in which Dante deviated from contemporary paradigms (and even from his own paradigms as expressed in *Convivio*) regarding the universe. Dante's fictional universe is constructed in a way that resolves certain inconsistencies in medieval understanding and that reconciles Christian theology with Aristotelian and Ptolemaic cosmological thought. As the centerpiece of my argument, I endorse the theory that Dante's universe behaves as the surface of a hypersphere. I argue further that Dante was aware of the physical and mathematical consequences of a non-Euclidean universe, for he uses the unique symmetry of a hyperspherical universe to illustrate beautifully the theology and philosophy of the poem.

Jacob Blythe, University Scholar

Bill Neilson, mentor

Physician Compensation: The American Struggle

Recent decades have devoted significant attention to healthcare reform in order to ameliorate the “healthcare crisis.” Comparatively little attention has been given to the unique set of historical circumstances that enthroned the United States as the number one healthcare spender in the world. Currently, the United States spends almost 3 trillion dollars a year on healthcare (roughly 17-18% of the GDP). Physicians in the US are the most highly compensated in the world; a specialist such as an orthopedic surgeon makes almost \$440,000 per year. A primary care physician might make a more modest \$185,000 per year. This thesis chose to focus on the constellation of factors that influenced the genesis of these incredible incomes. It is not necessarily obvious that physicians should be compensated this highly. Physicians around the world make far less, and many nations outperform the US in numerous healthcare outcomes. Interrogating the assumption that physicians should be compensated to this degree ended up leading to several key factors that shaped physician compensation: (1) the assumption that the elimination of suffering is an inherent moral good, (2) the influence that technologies such as the telephone and automobile had on physician practice, (3) the effect of urbanization on family relations, (4) a series of perverse incentives disguised or amplified by insurance, (5) the power of the AMA in shaping policy, (6) the ability of physicians to induce demand, (7) authority as a mode of control, and (8) the power of “sticky fees.”

Hannah Boman, English

Kristen Pond, mentor

George MacDonald and the Journey to the Ideal

Victorian author George MacDonald’s fantasy novels reveal an ideal he hoped the world could someday achieve. He explores this idea through men, women, and society in general. The ideal man is a noble knight: he is chivalrous, gentle, and aggressive only when necessary. The ideal woman varies depending on her marital status and age, but in general she is brave and wise. She protects in whatever way she can while serving as a mentor for the hero. Society’s ideal is impossible to achieve if it is not led by an ideal individual, but evidence of the change is shown in the attitudes of the citizens. The ideal leaders are frequently those society sees as weaker, such as women and children; under such a leader the people love each other well and embrace both strangers and minorities. This thesis traces the journeys MacDonald’s characters and kingdoms make towards the ideal in order to determine whether or not MacDonald believed our world could ever reach that state.

Ian Boys, University Scholar

Tamarah Adair, mentor

Genome-wide analysis of codon usage in Mycobacteriophage and S. aureus

The molecular genetics of microbial life, including viruses and bacteria, is of great relevance to medicine, evolutionary theory, and other areas of science. Here, we study the implications of codon bias, the non-random usage of synonymous codons, and GC3, the frequency of codons with guanine or cytosine in the third nucleotide position. Bias in codon usage frequently is the result of adaptation for optimal expression, reflecting tRNA abundance. It has previously been suggested that GC3 is similarly of functional significance, with implications for transcription and translation, which would suggest that it may likewise be under selectional pressure. We make use of the HHMI’s mycobacteriophage genome database to analyze trends in codon bias and GC3 content in a diverse set of viruses with a common host. To this end we adapt a technique, the production of genome landscapes, to observe trends in genome-wide GC3 usage, and find that patterns in GC3 content can be

informative in the difficult process of unraveling the complex relationships between mycobacteriophages. Similarly, we show that codon bias is likewise informative, though it in some instances contradicts the evidence provided by GC3 analysis, underscoring the complexity of such relationships. In a second portion of the study, we investigate the relationship between codon bias, GC3 content, and gene expression in *Staphylococcus aureus* BUSA 2288. We find that codon bias is correlated to highly-expressed genes in *S. aureus*, suggesting that it does indeed reflect selection for expression. GC3 is, however, not tied to any trend in expression.

Bonnie E. Cantwell, History and Philosophy

Joan E. Supplee, mentor

Los Evangélicos: A Historical Analysis of Protestant Missionary Endeavors in Peru

In the nearly five centuries spanning 1532 to 2015, Peru has experienced three primary political eras. From early colonialism, to nineteenth-century elite republicanism, up to twentieth-century democratization, Peru has evolved as a state and as a nation. Speaking to its nationhood, Peru's religious identity has long been marked by the hegemony of the Catholic Church. In the most recent decades, however, Protestantism, particularly Pentecostalism, has won converts through grassroots missionary endeavors. Although the contemporary Protestant movement appears to be a sporadic boom, it actually owes much to its evangelical predecessors. Missionary strategies in Peru have evolved alongside political eras, such that the establishment of Catholicism in the colonial era, gave way to the introduction of Protestantism in the republican era, which in turn opened up the "religious market" for the twentieth-century surge in Protestant adherents and democratic participants. These three movements will be analyzed individually, and cumulatively as each comes into partial expression in the work of Buckner International in present-day Peru.

Chelsea Carson, Psychology

Keith Sanford, mentor

Measurement of Event-Specific Capitalization in Couples

Capitalization is a component of intimacy that consists of how a partner responds when the other discloses good news. Previous research has identified four capitalization patterns: active-constructive, passive-constructive, passive-destructive, and active-destructive. Since capitalization theoretically takes place in the moment, it would be beneficial to have a scale to measure it in an event-specific manner. However, current self-report measures for capitalization are global, creating a need for an event-specific self-report survey. I examined the validity of a new event-specific survey by testing the following hypotheses. Event-specific scales measuring the four response patterns should show convergent correlations with global scales measuring the same response pattern, and divergent correlations with global scales measuring the other patterns. The event-specific scales should be associated with a measure of perceived partner responsiveness, with the active-constructive scale having the strongest positive correlation, and passive-destructive having the strongest negative correlation. Event-specific scales should also correlate with coping, with the active-constructive scale correlating with positive but not negative coping interactions, and passive-destructive correlating with negative but not positive coping interactions. Finally, the event-specific scale should explain unique variance in the criterion variables above that explained by the global scale and relationship satisfaction. In this study, 223 married or cohabitating participants completed an online survey comprised of global and event-specific capitalization, responsiveness, relationship satisfaction, positive coping, negative coping, affect, and well-being measures. The results provided support for all the hypotheses. Therefore, it seems that the event-specific scales capture something important and distinct from each other and their global counterparts

Clarissa Charles, Medical Humanities

William G. Hoy, mentor

Roman Catholics at the End-of-Life: Religious Documents and their Context Since 1994

Despite the current use of technology to control many aspects of life and death, the Catholic Church maintains that only God may regulate the initiation and termination of life. Science perfected a means of incurring a painless death, resulting in a growing acceptance of medical euthanasia. As the number of legislative bodies removing the ban on physician-assisted suicide increases, Catholic leaders continue to resist the promulgation of this societal trend. This thesis critically examines papal encyclicals, letters, medical conference proceedings, and Ethical and Religious Directives (ERDs) published since 1994 on end-of-life care, showing that life necessarily entails suffering, which is not a problem to be solved with euthanasia. The results of this analysis demonstrate that the Catholic Church believes medical practitioners have a continual responsibility to care for patients to the natural end of life, regardless of legislative and social pressure.

Jenna Cicardo, Neuroscience

Charles Weaver, mentor

Cognitive and Affective Empathy in Children with Autism Spectrum Disorders

Empathy is a multidimensional construct. The principal components of empathy are cognitive empathy and affective empathy. Cognitive empathy may be defined as the ability to understand another's thoughts and emotions and use inferences about another's internal state to predict his or her behavior. Affective empathy is sharing another person's emotions while recognizing that those emotions are not one's own. Individuals with autism spectrum disorders (ASD) have impaired cognitive empathy. However, it is not clear whether affective empathy is impaired in ASD. To investigate empathy in ASD, children with ASD and typically developing children will be shown four video clips depicting individuals experiencing mild discomfort or embarrassment and answer questions about how they think the person in the video feels as well as their emotional response to the videos. Implications regarding the results will be discussed.

Madison Cloud, History

Kimberly Kellison, mentor

Improvising Structures of Power and Race: The Sally Miller Story And New Orleans

In 1844, Sally Miller, a slave in New Orleans, filed a freedom suit against her previous owners. She claimed to be a German immigrant, illegally enslaved for over twenty years. Historians have argued that Miller's case is representative of Southern racial ideology and legal traditions of the antebellum era. This thesis will build upon those conclusions and seek to fit the case into the specific historical narrative of its setting. Through a detailed analysis of New Orleans' past, this thesis will place the Sally Miller case within that particular history. Because New Orleans had such a unique past, it is important to examine the case within that specific context. Its multicultural heritage created nontraditional structures of power and race. Within those structures, there was room for improvisation. Studying Sally's case with a focus on her home city and its character adds a new level of interpretation to the existing historiography.

Tyler Couch, Biochemistry

Rodney G. Bowden, mentor

Identifying Patients At-Risk for Hospital Readmission in a Socioeconomically Disadvantaged Population: A Retrospective Secondary Data Analysis

Excessive hospital readmissions currently represent a significant cost burden to the United States healthcare system. Under the Hospital Readmissions Reduction Program (HRRP), the Affordable Care Act (ACA) penalizes hospitals that experience an elevated rate of 30-day all-cause readmissions. Studies have shown that hospitals servicing patients of low socioeconomic status are at an elevated risk of receiving penalties for excess readmissions, and that certain variables might serve as identifiers of patients at risk of experiencing hospital readmission. In this study, a retrospective secondary data analysis was performed to assess the utility of demographic and clinical variables in predicting hospital readmissions. Data was collected from twelve federally qualified acute care facilities in central Texas whose patients live at or below 200% of federal poverty guidelines. The variables of age, sex, ethnicity, race, BMI, systolic blood pressure, diastolic blood pressure, temperature, pulse rate, smoking status, and the number of days between hospital encounter and follow up visit were collected and analyzed to determine their value in predicting 30-, 60-, and 90-day all-cause hospital readmission. This study presents that analysis and comments on potential uses of these variables as predictors of socioeconomically disadvantaged patients at an elevated risk of hospital readmission.

Zerek Dodson, University Scholar

Jann Cosart, mentor

Ecce Lignum Crucis – Medieval Piety, Ingenuity, and Music: A Transcription and Translation of the Good Friday Liturgy in the Jennings MS 9

Music has played a crucial role in Christian worship since the beginning of Christianity itself. Over the course of the first millennium of this era, a large repertory of monophonic chants was developed and disseminated through oral transmission. The Western Church encouraged the development of systems of musical notation to preserve these chants, of which square notation eventually became dominant. Scribes compiled and copied various types of liturgical books, including Graduals that contained both chants and rubrics for the observance of the Mass. This study investigates a manuscript Gradual of plainchant in square notation, the Baylor University Jennings Collection MS 9, which originated in Spain during the late fifteenth century, endeavoring to contextualize it within its historical and liturgical framework. Focusing particularly on the Good Friday section within Holy Week, the study considers the paleographic, codicological, and musical features of the manuscript, transcribing and translating both music and text.

Audrey Eichenberger, University Scholar

N. Bradley Keele, mentor

The Effects of Serotonin Depletion on AMPA Receptor Expression within Rat Amygdalae

Although anxiety disorders act as a prevalent source of American morbidity, as they affect as many as 40 million American adults over the age of 18 annually, the cellular mechanisms underlying the levels of heightened fearfulness are largely unknown. While the amygdala is understood to play a substantial role in the development of fear and, thus, the pathogenesis of anxiety disorders, additional research is necessary, in order to investigate the complexity of the specific neurobiological mechanisms involved. Both decreased levels of serotonin and an increase in AMPA receptor expression have been linked to increased fear learning and neuronal excitability. Therefore, this thesis seeks to expand upon the impact of serotonin on altered AMPA receptor expression within

the basolateral complex of the amygdala. Rats were given bilateral injections of 5,7-dihydroxytryptamine (5,7-DHT) into the amygdalae, in order to decrease the concentrations of serotonin. Then, brain samples were taken, the homogenized tissue samples were run through western blots, and the separated proteins were transferred to PDVF membranes. After incubating the membranes in primary and secondary antibodies, the blots were visualized using the ImageQuant LAS 4000 system, and the immunoreactive bands were quantified densitometrically using Image J software. ANOVA data analysis software was ultimately used to investigate the hypothesis that the rats that were treated with 5,7-DHT would show increased levels of AMPA receptor expression, which is characteristic of animals with heightened anxiety.

David Eschrich, University Scholar

Julie deGraffenried, mentor

Orthodoxy and Existentialism: The Religious Roots of Dostoevsky's Moral Dialectic

In my thesis, I show the ways in which Russian Eastern Orthodoxy relates to and impacts Fyodor Dostoevsky's Existentialism. I begin by identifying and explaining the Orthodox theme of transformative suffering, as it is present in Russian Ecclesial tradition, after which I demonstrate the presence of this theme and tradition in Dostoevsky's upbringing. I close by relating this transformative suffering to the moral dialectic Dostoevsky establishes in his novels, specifically *Notes From Underground* and *Crime and Punishment*. In doing so, I show the similarities and conversation between Russian Eastern Orthodoxy and Dostoevsky's Existentialism.

April Fleming, University Scholar

Ivy Hamerly, mentor

The Political Viability of Universal Health Care in the United States

Universal health care in the United States is possible, granted that the government incentivizes states to implement Bismarck health care systems, requiring health insurance companies to offer a basic coverage package for no profit, enabling free choice of health care provider, regulating health care costs, maintaining health care coverage during unemployment, and streamlining health care administration systems. This paper will first prove that the United States health care system is broken. The second chapter will describe some key features of the Affordable Care Act and prove that the law does not go far enough to solve our health care problems. The third chapter will explain how the Bismarck system could solve many of the problems of the American health care system, and the fourth chapter will propose a strategy for the United States to follow with regard to its transition from a broken health care system to universal health care. This paper will be employing the method of comparative study.

Erin E. Foster, University Scholar

Sung Joon Kim, mentor

The Effects of Vancomycin on the Structure of Cell Wall Peptidoglycan of vanB-type Vancomycin-Resistant Enterococcus faecalis by Liquid Chromatography-Mass Spectrometry

Enterococcus faecalis is a leading cause of nosocomial infections, and the clinical emergence of vancomycin-resistant *E. faecalis* (VRE) makes studying this bacterium increasingly urgent. This study investigates a *vanB*-type strain of VRE (ATCC 51299), which is vancomycin-resistant upon vancomycin's induction of the *vanB* operon and subsequent changes in the structure of cell wall peptidoglycan that result in reduced affinity of vancomycin for peptidoglycan. This study explored the effects of vancomycin (at 6 µg/mL) on peptidoglycan structure of VRE using a novel approach that involved a combinatorial, *in silico* peptidoglycan mass library paired with liquid

chromatography-mass spectrometry. In addition to observing the *vanB*-related changes of the presence of terminal D-Ala-D-Lac and increased D,D-carboxypeptidase activity, increased L,D carboxypeptidase activity and increased O-acetylation were also observed upon the presence of vancomycin, findings which suggest additional mediating roles of vancomycin in the creation and editing of cell wall peptidoglycan.

Mariah Sky Franklin, Professional Writing

Micheal-John DePalma, mentor

Praise Him with the Dance: Incarnation, Creation, and the Sacred Art of Movement

The art of dance, while central to many cultures and religions worldwide, has often been neglected by the Christian community - especially in its discussion of theology and the arts. Though there is clear biblical, historical, and literary precedent for the significance of dance as a form of Christian worship and celebration, the beauty of this art has often been obscured by stigmas against embodiment. However, for Christians, who profess a theology of the Word made flesh, the embodied art of dance has great potential as an avenue for experiencing and communicating spiritual truths. In my thesis, I explore the history and significance of dance within Western Christian culture, discussing subjects such as the value of art as a spiritual language, theology of the body, creativity as essential to our status as created beings, and dance as a form of communion with God and with others. I focus on the value of this art from a Christian theological context, incorporating scholarship on the connection between theology and the arts as a whole. My own research and analysis builds on the work of scholars, artists, and organizations that pursue excellence in the arts, advocating for dance as a sacred art.

Daniel Gaskell, Geology

Rena Bonem, mentor

Marine Fish Productivity Across the Paleocene-Eocene Thermal Maximum

The Paleocene-Eocene Thermal Maximum (PETM), a transient global warming event ~55 Ma, is one of the closest geologic analogues to modern-day climate change. While the PETM is known to have triggered extinctions in deep-sea ecosystems and extensive biogeographic shifts, little work has been done on the response of higher-order marine vertebrates. This work presents mass accumulation data for fossil fish teeth (ichthyoliths) in three ODP/IODP pelagic sediment cores. In all three records, the initial stages of the PETM are associated with a significant transient increase in fish productivity, which may have peaked approximately 10,000 to 15,000 years after the onset of the PETM; the highest resolution data, from the Atlantic, suggests that this increase may have come after a period of significantly depressed productivity. Changes in net primary productivity, as determined from biogenic barium proxies, do not appear sufficient to fully explain the observed trends.

Dillon Gasper, Health Science Studies

Bill Neilson, mentor

Disparities in healthcare: Diabetes outcomes among low-income individuals living in Texas

The ballooning epidemic of chronic diseases in general, and diabetes in particular, is representative of the changes in health and disease in the twenty-first century. Despite these drastic disease burden changes towards more chronic conditions, disparities persist among low-income populations. The purpose of this research is to explore what marks the disparities in diabetes using Texas public health data from the Behavioral Risk Factor Surveillance System, the world's largest telephone survey. SAS analyses were executed to compare socioeconomic factors with diabetes complications. By comparing diabetes with demographic data and other comorbidities this research found how strong of an association exists between critical diseases like cardiovascular disease. The results demonstrated people living below the poverty line were 6.78 times (95% CI 6.06, 7.59) more likely to be uninsured

as compared to people living above the poverty line. Insurance in America is the gateway to preventative health services. It follows that the poor are at a heightened risk for mismanaged blood sugar in diabetes, which leads to gaping disparities in diabetes complications. In better understanding what marks these disparities, the hope is improve health care for the poor and marginalized.

Megan Genovese, University Scholar

Sarah Walden, mentor

Boys, Girls, and Monsters: Regulation of Normative Gender in Supernatural

Supernatural, a cult phenomenon currently in its tenth season on the CW, is about Sam and Dean Winchester and their heroic journey across a Gothic horror landscape of things that go bump in the night; as Dean puts it, "Sweetheart, this ain't gender studies." Yet while the creators may not have intended it to be as much, popular media texts always contribute to the construction of hegemonic norms. A close reading of Seasons 1 through 9 reveals that *Supernatural* is in fact built upon the bedrock of binary sex-gender identities. Through both individual characterizations and narrative structure, *Supernatural* presents detailed portraits of idealized maleness and femaleness the depend on mutual exclusion and the subordination of female characters to the male ego ideal embodied in the Winchesters. Most interestingly, *Supernatural* also features a host of inhuman characters, through which emerges a third portrait of monstrosity as that which threatens the integrity of normative male and female identities.

Tyler Goddard, Biochemistry

Kevin G. Pinney, mentor

Design, Synthesis, and Biological Evaluation of Novel Benzosuberene Analogues as Potential Cancer Therapeutic Agents

Microtubules play an important structural role in the endothelial cells of tumor vasculature. This vasculature is distinct from that of healthy cells and characterized as immature and chaotic, making it an attractive target for anti-cancer therapy. Small molecule compounds known as vascular disrupting agents (VDAs) have the ability to starve tumors of the oxygen and nutrients necessary for their survival and proliferation. Benzosuberene analogues, structurally based in part on the natural products combretastatin A-4 and colchicine, bind to the colchicine site on beta tubulin, inhibit the formation of microtubules, and thus function as cytotoxic, antiproliferative agents. Four new analogues of KGP18, the lead benzosuberene based anti-cancer agent, were designed and prepared by chemical synthesis to extend the structure-activity relationship of the benzosuberenes. Structural modifications incorporated into these analogues include functional group modifications at the 1-position and 2-position on the 6:7 fused ring system, as well as functional group translocations on the pendant aryl ring. All four compounds were evaluated for their inhibition of tubulin assembly and their cytotoxicity against three different human cancer cell lines, and one of the compounds prepared strongly inhibited the polymerization of tubulin (IC₅₀ of 1.2 μM). Although none of the new analogues displayed cytotoxicity as high as that of KGP18, their synthesis and biological evaluation will facilitate the design of more potent benzosuberene based compounds in the future.

Ashley Gross, Apparel Merchandising

Lorynn Divita, mentor

The decline of the American middle-tier department store: A case study of JC Penney

Founded in 1902, JC Penney was once the epitome of where the middle-class American consumer shopped for general merchandise and was initially perceived as an innovator within its segment in the retail industry. How was

it that this giant fell to financial strife, an erratic and unfocused corporate strategy and a waning customer base? This thesis works to uncover the challenges that face not only JC Penney, but the middle-tier department store segment as a whole. Through the format of a case study, this work analyzes the factors influencing their decline in addition to charting financial performance across a thirty-year period (as far back as public records are accessible). Net sales and net income as a percentage of net sales data were collected in order to create a visualization which illustrates the prolonged decline of JC Penney and similar retail formats. This thesis offers insight to the current trends in the retail industry, and how examines the fate of middle-tier department stores.

Jonathon L. Gross, Baylor Business Fellows, Economics, and Biology

Chris Kearney, mentor

The Development of Mosquitocidal Protein Toxin for Delivery in Yeast-Based Traps

Throughout history, humans have been plagued by vector-borne diseases such as dengue fever, malaria, and yellow fever. These particular diseases are spread by mosquitos, and they cause severe losses to human growth and development, to productivity, and to society as a whole in endemic regions. In this thesis, one explores the potential for yeast-based bait stations as a novel method for controlling these mosquito populations. In order to do so, one tested the lethality of a few toxins on mosquito populations, the efficacy of different bait station designs, and the relevance of carbohydrate media in the process. Overall, one would say that yeast-based traps for the control of mosquitos are not currently the best option available. However, further study with toxin cocktails specific for mosquitos and potential expression in plant nectar or other natural mosquito food sources would be important avenues to pursue in the fight against these diseases.

Ali Groves, University Scholar

Michaela Ritter, mentor

The Impact of Communication Methods on the Reading Development of Children with Cochlear Implants

Research has shown that children who are deaf on average graduate from high school with a fourth grade reading level. However more recent research shows that with the invention of cochlear implants children who are deaf now have the ability to read at levels equal to their hearing peers. One variable that may affect a cochlear implant user's ability to read at such a high level is the communication method they use. It is important for parents to select the communication method that will best foster their child's reading development because children who cannot read will encounter social, personal, and economic limitations. However it is often difficult for parents to decide which communication method their child should use. This paper seeks to help parents of children with cochlear implants identify the communication method that will be most beneficial for their child's reading development. This research paper provides a meta-analysis of studies assessing the effects that oral communication methods and manual communication methods have on the reading achievement of children who are deaf and use cochlear implants. Examination of the literature suggests that oral communication methods are most likely to benefit the reading development of children with cochlear implants. This finding makes sense when considering the important role that oral language plays in the development of reading skills. Parents of children with cochlear implants can use the information provided by this meta-analysis to facilitate the selection of the best communication method for their child. Implications of using an oral communication method are considered, and suggestions for future research are given.

Mary Hamilton, University Scholar

Zhenrong Zhang, mentor

Tip and Substrate Preparation for Tip-Enhanced Raman Spectroscopy

Tip-enhanced Raman spectroscopy (TERS) combines scanning tunneling microscopy with Raman spectroscopy to obtain both the morphology and the chemical composition of a molecules on a surface. A sharp noble metal tip acts as a Raman active sensor for Raman scattering while the material and morphology of the substrate affects the Raman signal enhancement. This research approaches the application of TERS from both the tip and the substrate aspects. Electrochemical fabrication procedures are investigated to etch sharp gold and silver tips. Molybdenum disulfide (MoS₂) substrates are prepared using molecular exfoliation and studied using TERS for the employment of semiconductor Raman active substrates. Gold tips were successfully etched at voltages ranging from 1.5V to 4.0V. After analysis with a scanning electron microscope, tips etched at 3.5V show the best combination of shape and sharpness. A cutoff circuit was integrated into the etching setup in an attempt to increase tip sharpness by reducing cutoff time. Analysis of silver tips etched with the cutoff circuit showed blunter tips than those etched without the circuit. MoS₂ multilayer samples visualized with an optical microscope showed flakes of varying thicknesses. Atomic Force Microscopy revealed that the flakes are composed of bulk MoS₂ as opposed to monolayers. Raman mapping, used to measure signal intensity of materials, showed greater signal intensity for regions of thinner MoS₂.

Michelle E. Herbelin, History

Michael Parrish, mentor

Until Whipped or We Conquer: A Biography of Colonel J.W. Fannin Jr.

This thesis is a biography of Colonel James W. Fannin Jr., a pivotal and controversial but often marginalized figure in the Texas Revolution. Showing brilliant potential in the 1835 campaign, he was later caught up in the midst of a constitutional crisis in the Texas Provisional Government. He struggled to reckon with conflicting duties and unrealistic expectations in the face of the rapidly advancing Mexican Army. Fannin did not live to see the outcome of the Revolution and met his death in a bloody episode known commonly to Texas historiography as the Goliad Massacre. This study makes use of Fannin's own frank, often introspective correspondence, accounts from the survivors of his command, and even more heretofore unutilized sources, endeavoring to describe Fannin in his rightful historical context: as an American, Southerner, and Texian.

Rachel N. Hess, Applied Mathematics

Robert C. Kirby, mentor

A Parallel Implementation of the Galerkin Method for Solving Partial Differential Equations on a Triangular Mesh

Finite Element Methods are techniques for approximating solutions to boundary value problems for partial differential equations from an approximating subspace. These methods are derived from weak or variational forms of the BVP that require less of the problem functions than what the original PDE would suggest in that the solution need not have partial derivatives up to as high of order and the right-hand-side of the PDE need only be integrable instead of continuous. In the scope of this project, we focused on implementing the Galerkin Finite Element Method, which provides a best approximation to the true solution from a finite-dimensional subspace of piecewise polynomial functions defined on a triangular mesh. For this thesis, we developed a shared memory parallel implementation of the Galerkin Method that can be executed on a GPU to minimize runtime by means of multiple processors working simultaneously in unison on each calculation by sharing memory. For this purpose, the open-source library PyOpenCL was used in this implementation because of its access to OpenCL using Python.

Thus we are able to explore how essential tasks in the solution process map onto shared memory platforms, such as through the construction of the stiffness matrix from the connectivity data of the triangular mesh that may then be used to approximate the true solution with numerical methods.

Nita Hight, Political Science

Steve Block, mentor

Legislating Marriage: A Constitutional Examination of Same-Sex Marriage

One of the most pressing legal issues facing the American legal system is the question of homosexual marriage. Following the legalization of homosexuality following *Lawrence v. Texas* in 2003, and the Supreme Court's subsequent 2013 decision to recognize same-sex marriages on the federal level in *U.S. v. Windsor*, few issues can match the fervor with which same-sex marriage is discussed. This thesis examines the Court's jurisprudence concerning marriage, sexual autonomy, privacy, and discrimination in order to determine the appropriate level of scrutiny for the Court to use when examining this issue, and then proceeds to apply that level of scrutiny in order to demonstrate that state bans on same-sex marriage are unconstitutional infringements on the liberty of homosexual persons. Finally, I demonstrate that the legalization of same-sex marriage will not have the effect of moral degradation feared by some opponents of legalization, namely those expounded upon by Justice Scalia in his famous dissent in *Lawrence*.

Rebecca L. Holden, Chemistry

Bryan F. Shaw, mentor

Observing an measuring charge regulation between two redox states of myoglobin using protein charge ladders and capillary electrophoresis

Charge regulation occurs when a protein modulates its net charge in a way that minimizes some perturbation, e.g. the binding of a metal cofactor. Net charge is a fundamental biophysical property that is nonetheless poorly characterized for many proteins. Although charge regulation has been observed in a handful of cases (1,x,X), the extent to which this phenomenon occurs, its mechanisms, and its function not well understood. This study examined charge regulation in myoglobin in the transition between two redox states of the heme iron, oxy-Mb (Fe^{2+}) and met-Mb (Fe^{3+}). Protein charge ladders and capillary electrophoresis were used to measure the net charge of each myoglobin species ($Z_{\text{oxy-Mb}}$ and $Z_{\text{met-Mb}}$). It was determined that $Z_{\text{oxy-Mb}} = -1.67 \pm 0.09$, while $Z_{\text{met-Mb}} = -1.02 \pm 0.06$. The difference between the net charge of these two states, 0.6 ± 0.1 , was smaller than the expected 1.0 unit. The net charge of myoglobin was regulated by 0.4 ± 0.1 units in the transition between oxy-Mb and met-Mb. This study demonstrated the existence of charge regulation in myoglobin, suggesting that this phenomenon may be more widespread than previously considered.

Sarah Hontz, Athletic Training

Andrew Gallucci, mentor

A Systematic Review of Recent Literature On Religious Identity, Stress, Depression, and Prescription Stimulant Misuse

Stress and depression have been heavily researched in associated with prescription stimulant misuse and is one of the main motives that students will list for reasons to misuse prescription stimulants. Religiosity has also been researched in relation to prescription stimulant use, however majority of the research focuses on alcohol and illicit

drug use. Our object was to conduct a systematic review of published empirical studies to evaluate the connection of all three factors to prescription stimulant misuse. Of 1,415 studies reviewed, only 113 meet inclusion criteria for the study. Research of stress and depression showed a heavy correlation between higher stress level and depression to prescription stimulant misuse. Research showed a lack of knowledge between the relationship of religiosity and prescription stimulant misuse due to the fact that only 4 of the 113 included studied religion. Our conclusion was that while there are numerous studies on stress factors and depression symptoms to the likelihood of misuse of prescription stimulants, there seems to only be a surface level of knowledge. This is because while research understands that there is a correlation, there is little research as to what is causing this and how colleges and college students can better manage these factors to decrease the risk of prescription stimulant misuse.

Laura Beth Hooper, International Studies

Steven Jug, mentor

Water, Power, and Gender: Interrogating Development in the Slums of Dhaka, Bangladesh

Urban migratory trends represent one of the most significant challenges for modern international development. For, in the context of weak state capacity, the flood of people moving to cities funnels directly into slums—densely populated urban settlements whose complex power networks render them inscrutable to government bodies and Non-Governmental Organizations (NGOs) alike. I argue that in order for effective development to occur, project designers must understand the nuanced complexity of the both formal and informal power networks organizing the lives of slum-dwellers. In order to demonstrate this, I focus my study on processes of water acquisition in the slums of Dhaka, Bangladesh. After first exploring the gendered, social nature of water-related deprivations and thus reorienting traditional binary discourses on access to sanitation and drinking water, I identify and analyze the primary strategic approaches employed by NGOs and the government of Bangladesh, with an emphasis on the participatory resource management model. This acts as the foundation for my analysis of power dispersion in the Dhakkan slum context, in which processes of water acquisition force slum dwellers to navigate complex axes of identity-creation. Of these axes, I focus specifically on gender as a means of better understanding the simultaneously individualized and culturally-situated process of power navigation in the slum context. I conclude with broader recommendations for NGOs seeking to undertake development in the urban context.

Carly Hubbard, University Scholar

Elise Edwards, mentor

Early Borders: Implications of Fetal Status

This thesis will examine the implications of different assumptions from opposing ethical viewpoints on topics concerning embryos and fetuses. This essay seeks to clarify the assumptions ethicists and medical professionals make about the status of the fetus in debates about abortion, embryonic stem cell research, and prenatal surgery. Three different ethical viewpoints on fetal status articulated by ethicist Thomas Shannon will guide the analysis of implications of their ethical view on each of those topics. Adopting a methodology informed by descriptive ethics instead of normative ethics that uses each of the three opposing stances about fetal status adopts a neutral stance on these controversial issues. After an initial chapter defining fetal status according to the three viewpoints, subsequent chapters will reveal how each of these stances are found in debates about abortion, embryonic stem-cell research, and prenatal surgery.

Casey Lynn Hughes, University Scholar

Alden Smith, mentor

Weaving the Labyrinth: Paradoxes and Parallels in Catullus 64

This thesis examines poem 64, the longest poem written by Catullus, and analyzes its internal structure as well as the allusions made to Apollonius Rhodius' *Argonautica* and Euripides' *Medea*. While Catullus is perhaps more well known for his love poems to Lesbia, C. 64 gives a unique insight into the poet's personal interpretation of other works, as well as his outlook on love, sorrow, and the accompanying emotions. This poem narrates the wedding of Peleus and Thetis, the parents of the hero Achilles. On the marriage bed lays a purple coverlet, which retells the sorrowful love story of Theseus, the Athenian prince and Ariadne, the princess of Crete. Though, given their contrasting images of love, these two couples seem incompatible, I will show how they are analogous through paradoxes and parallels within the structure of the poem. In addition, I will examine the allusions to the *Medea* and *Argonautica*, considering how Catullus has used these works to forge a place for his name within poetic tradition.

Aman Jain, Biology

Richard Sanker, mentor

Radiation Exposure and Cement Volume during Fluoroscopy-Guided Percutaneous Vertebroplasty

According to new state and federal mandates, radiation exposure and patient safety are being evaluated, tracked, and recorded. Through our Department of State Health Services, Texas has enacted regulations to establish guidelines for radiation reporting for various diagnostic and therapy. Vertebroplasty, the procedure studied, is a minimally invasive surgical procedure using a biopsy needle guided into a fractured vertebra under x-ray guidance to fill the spaces of the damaged vertebra with bone cement to restore structural integrity. Complications following such a procedure have been linked to over-filling of the vertebral body. The radiation exposure, surgical time, and cement volume injected per vertebral body during percutaneous vertebroplasty were investigated in this cross-sectional study of 101 patients in Waco, Texas. It was found that the procedures in the lumbar spine can be performed slightly faster, and with less fluoroscopic time for the patients. Compared to the thoracic spine however, the total body dose per level was almost 60% higher and the skin entry dose was almost 70% higher per level. Vertebral bodies in the lumbar region required an average of 66% more cement than vertebral bodies in the thoracic region.

Bryan Jan, Biochemistry and Biology

Zhenrong Zhang, mentor

Preparation of Promising Substrates for Surface-Enhanced Raman Spectroscopy

The goal of this study was to fabricate and characterize metal thin films of silver and aluminum to determine the effects of deposition thickness and deposition temperature on nanoparticle morphology and size. Chemical thin films were successfully synthesized by physical vapor deposition (PVD) onto various substrates. Depositions were accomplished by either thermal evaporation or electron beam evaporation. A collimator was implemented that reduced the evaporation spot size of the thermally evaporated copper phthalocyanine (CuPc). Electron beam deposition of silver and aluminum yielded thin films that were confirmed with energy-dispersive X-ray spectrometry and X-ray diffraction. Surface nanostructures were analyzed with scanning electron microscopy (SEM). A trend of increasing density for silver island clusters with increased deposition thickness was noted. Increased nanoparticle size for depositions at elevated temperature was also observed. Similarly, thicker depositions of aluminum yielded larger nanoparticles and a trend of increased nanoparticle size was observed for

elevated temperature depositions. Further research to characterize and optimize deposition parameters for surface-enhancement of Raman signals is necessary.

Erica Xuewei Jiang, Business Fellows, Economics, Mathematics

John Martin, mentor

Corporate Bankruptcy Prediction Using Artificial Neural Networks

Financial distress is a condition where a company has difficulty paying off its financial obligations to its creditors. Failing to relieve financial distress can lead to bankruptcy, which is very costly to the financially distressed company, investors, and borrowers. As a result, corporate bankruptcy prediction is of great interest to both academics and practitioners. While a number of bankruptcy prediction models have been published, Altman's Z-score model is still commonly used by practitioners as a standard to evaluate a firm's financial healthiness after almost fifty years since it was published. Can the performance of bankruptcy prediction models be improved? Specifically, in this paper, we explore the use of artificial neural networks. Our model shows strong discriminating power in a Receiver Operating Characteristics analysis, and outperforms the hazard model and the distance-to-default model in detecting bankruptcies.

Peter Jiang, Medical Humanities

Bill Neilson, mentor

Utilizing Protocols in the United States Healthcare System

In the current United States healthcare system, there are no standardized methods of practicing medicine. There is also no standard by which physicians are reimbursed for their services. Consequently, the cost of healthcare in the United States is much higher than other countries, while the quality of care is not proportionally higher. In order to combat this problem, utilizing evidence-based protocols can help to reduce the unnecessary costs involved in healthcare and simultaneously improving the quality of care through best practices. In order for the protocol driven system to function properly, there are a few obstacles to overcome such as gathering strong evidence for protocol creation, creating an unbiased and well represented committee, and physician compliance. Through proper planning and employment of modern technology, evidence-based protocols are an effective means of providing positive healthcare reform in the United States.

Alysia Johnson, Anthropology

Tom Offit, mentor

Moscós Peligroso: Dengue Fever on a Mexican Caribbean Island

Dengue Fever is a viral infection spread by the bite of mosquito that usually resides in a tropical or subtropical area. Roughly 2.5 billion people live in an areas that are currently at risk to the transmission of Dengue Fever. This paper explores Dengue fever knowledge and prevention on Isla Mujeres, a Caribbean island in Mexico. Central themes point to areas of prevention education (outreach) and efficacy (practice) and illustrates a lack of education in identifying symptoms of Dengue Fever as well as knowledge of prevention efforts and makes suggestions where some areas of public health can be modified.

Catherine Jones, Finance

Paul Larson, mentor

Riding with Don Quixote and Sancho: A Spanish Knight in the 17th Century

The honors thesis is a literary/historical/economic analysis of the two most influential characters in Cervantes' 17th century novel, *Don Quixote de La Mancha*. The thesis focuses on the impact that Alonso Quijano, the title character's real/original name and Sancho Panza, Don Quixote's wise-cracking sidekick, have on one another. The thesis also contains a study of Cervantes' social commentary portrayed through the actions and dialogue of the two characters. The first chapter is a historical background of the time period when Cervantes wrote the novel and the significance the history and economy had in the the action of the novel. The remaining chapters look at Alonso and Sancho as individuals. The chapters explain the transformation the two characters undergo, and the concluding chapter discusses the end of the novel and how the characters are different in the end.

Victoria Jones, Political Science

Steve Block, mentor

A Sexual Revolution in the Court: An Examination of the Constitutionality of Morally-Based Sexual Laws

In the United States, the standards of acceptable sexual conduct are continually evolving. Socially, a shift has occurred towards accepting actions that, at other points in time, were considered grievous sexual deviancies. Similarly, the Supreme Court since *McLaughlin v. Florida* has gradually acknowledged not only a definite right to privacy, but a right to choose whether to bear children, whom to marry, and what sexual intimacies to engage in. Through the line of these cases, beginning with *McLaughlin* and including such cases as *Roe v. Wade*, *Loving v. Virginia*, *Eisenstadt v. Baird*, and *Lawrence v. Texas*, the *Supreme Court undergoes a sexual revolution, setting the stage for the acknowledgement of further sexual rights. In light of these cases, and particularly in light of Lawrence v. Texas*, the laws regarding cohabitation, adultery, and fornication can no longer be considered sound legal statutes. These laws are, in light of recent Supreme Court precedent, unconstitutional and when and if they arrive before the Supreme Court, if principles follow they will be declared as such, or else repealed by the states in which they were enacted in favor or more progressive stances towards the changing social environment surround sexual relationships and intimacy within the home.

Hanna Kattilakoski, Finance

John Ssozi, mentor

The Trade-off Between Outreach and Sustainability in Microfinance Institutions

Microfinance institutions (MFIs) aim to increase the standard of living in poor communities through small-scale lending. Because many people lack collateral in these impoverished areas, obtaining loans from banks is difficult if not impossible. Small-scale lending allows individuals to start or expand their business. However, many microfinance institutions are heavily subsidized. Recent interest in the commercialization of microfinance institutions has begun a spark in the interest of creating sustainable MFIs. This study examines existing microfinance institutions throughout the world to determine the trade-offs associated with outreach and sustainability. Data is used from the Microfinance Information Exchange, which is a non-profit organization that collects self-reported data and is an information provider in the microfinance sector. The results indicate that for a variety of reasons, larger outreach often indicates better business performance.

Abigail Klein, Journalism

Marlene Neill, mentor

How do Nonprofits React in Crisis Situations?

Nonprofit organizations have crisis situations frequently, however, there are few significant studies regarding nonprofit organizations and how they handle crisis situations. For this study Livestrong, The American Red Cross and Susan G. Komen were analyzed based on the specific crisis situations they dealt with in 2012. The study examined tweets and press releases through a content analysis from each of these organizations in order to determine their specific response. Results demonstrate that these three organizations tend to use specific tones within their text, they use denial, evasion of responsibility, reducing offensiveness, corrective action or mortification from Benoit's Image Repair strategy, they expressed commonalities among interactivity, as well as whom they referred to and their similar focus.

Lindsay Larimore, Studio Art

Virginia Green, mentor

The History of Book Jacket Design & Its Cultural Significance

Book jacket designs act as historical snapshots of the visual culture prevalent during their creation through the use of typography, shapes, style of imagery and overall mood. Illustration also played a significant role in development of the book jacket as an art and advertising medium, although illustration now struggles to maintain its prior prestige in the digitally-dominate 21st century. By studying these historical examples and examining the development of the medium, I created three book jacket designs as a practical demonstration of the knowledge I gained.

Emily Larson, University Scholar

Stanley Wilfong, mentor

A Review of the Significance of Calcium & Vitamin D in the Occurrence Stress Fractures

Stress fractures have historically been a common problem for athletic populations, especially athletic women. Professional ballerinas are a specific population that is considerably harmed by these injuries, and many years of research have been spent discovering what factors concerning anthropometrics, lifestyle, and diet correlate most strongly with these occurrences. Early research on this topic focused mainly on calcium intake, due to calcium's obvious role in bone structure and integrity. However, inconsistent findings and statistically insignificant differences in calcium intake between test groups from many research studies demonstrated that there is more to bone health than calcium alone. More current research has shifted its focus to include vitamin D and other nutrients in cooperation with calcium to provide a clearer picture of the dietary factors of bone health. Dancers who experienced stress fractures often exhibited levels of 25-hydroxy-vitamin D below 30 ng/dl, the lower limit of the recommended serum vitamin D range for optimal health, indicating the importance of vitamin D to bone integrity. A critical review of nearly thirty years of research will be conducted to make a conclusion on the significance of calcium and vitamin D in the occurrence of stress fractures and how dietary adjustments can help ballerinas to avoid fractures.

Megan Legband, University Scholar

Sarah-Jane Murray, mentor

The Star Seeker

Storytelling is a defining constant in every culture, for our stories remind us who we are and what we value. In light of this fact, I chose to write a screenplay about a heroine named Aster, whose fear of the dark and quest for light mirror humanity's search for good. Through her journey across the land of Pelclair with her friends Rhys and Tago, Aster discovers that she has a higher calling on her life and must overcome great obstacles in order to save her sister and her kingdom. Drawing on my studies of great books and great films, I have written an epic adventure narrative with the hope of creating a work that will encourage people to pursue their own callings despite the darkness they may face.

Alexandra Leggett, University Scholar

R. Alden Smith, mentor

Translating Tolkien: The Lord of the Rings Films as an Imitation, Interpretation, and Emulation of Tolkien's Work

Often, film adaptations of literature are glibly dismissed as being subpar to the book on which they were based. Movies and books, however, are inherently different forms of media. Utilizing terms found in the old but ever-useful literary study by Arno Reiff, this contribution will posit three avenues through which a film may adapt or render its literary predecessor onto the silver screen. This thesis will distinguish between these adaptive methods, elucidating how the film version of J. R. R. Tolkien's *The Lord of the Rings*, directed by Peter Jackson, draws on the text. The thesis will thus offer in-depth analyses of several scenes from *The Lord of the Rings* films as a reproduction (imitatio) of, translation (interpretatio) of, and dressed-up echo seeking a sort of rivalry (aemulatio) of Tolkien's original work. Elements of each of these surface in Jackson's adaptation.

Siyao Li, University Scholar

David D. Corey, mentor

Sovereignty & Tianxia: Origin, Development and Comparison

The political trajectories of China and Europe have been remarkably different. China is a powerful unitary state with relatively little economic innovation and relatively little identity change throughout its history, whereas Europe is divided into numerous nation states containing diverse cultures, with relatively limited government and tremendous social and economic change over the course of its modern history. In this thesis I explore the possibility that much of the difference may be explained in terms of the development of the theory of sovereignty in the West, and the absence of that development in China. China independently developed a concept of its own, the "Tianxia" concept, which emphasizes hierarchical order and moral unity. At root, the difference between Europe and China comes down to institutionalized conflict versus institutionalized harmony, or so I wish to suggest. My thesis explores the background, origin and development of the Western concept of sovereignty based on canonical political philosophical texts and compares findings with the Tianxia concept of China, ending in an assessment of how the sovereign system could be complemented by contributions from the Tianxia concept.

Kandace Little, Psychology

Hugh H. Riley, mentor

Interdisciplinary Influences on Systemic Enlightened Sexism: Changing the Gender Narrative

Enlightened sexism is a phenomenon in which a progressed society maintains sexist components that contradict the accomplishments of women's rights movements, as well as the inherent worth of all genders. I explore the ways in which biology, subconscious mechanisms, and language interact to reinforce the perpetuation of sexism in modern American society. Gender is conceptualized as a useful social construct, influenced by biological sex, but fundamentally different from it. The idea of biological sex as deterministic of gender fails to acknowledge an individual's agency in utilizing gender as a tool of identity, as well as fails to acknowledge the role of environment in shaping gender. This new perspective incorporates the importance of gender in the construction of identity, with the acknowledgement that language is complicit in the manifestation of implicit bias that contributes to social inequalities. Misleading views on sex, gender, as well as privilege associated with a particular sex and its appropriate associated gender performance, perpetuate enlightened sexism, and provide a means to justify social inequalities. A key way to dismantle the social norms for gender involves changing the narrative of gender, as well as reconsidering the fight for gender equality as a social justice issue that affects all individuals.

Shey Lopez, Neuroscience

Heidi Hornik, mentor

Despite being published in 1605, Miguel Cervantes' *Don Quixote de La Mancha* is still a well-known novel. Cervantes illustrates Don Quixote as a delirious man who sets off on an adventure to restore nobility. However, he seeks to restore chivalry as a knight errant. Ironically, Don Quixote's name is symbolic. According to Eric Mayer's article, *Notes on the Æthiopica, the Lives of Homer, and the Name "Don Quixote de la Mancha*, Quixote eludes to a jester, blanket or cloak, or piece of armor worn over the thigh. Likewise, de la mancha is Spanish for stain. With this background information, the reader can already conclude that Don Quixote is everything, but ordinary. Throughout the novel, there are various scenes where Don Quixote acts outside of the norm. During the Golden Age, there were certain characteristics a man had to attain in order to be masculine, characteristics all of which Don Quixote lacked. This paper compares Don Quixote's characteristics to the characteristics of the ideal man during the Golden Age.

Chi-Han (Thomas) Lu, Biochemistry

Kevin Pinney, mentor

Synthesis of a novel benzosuberene analogue as an anti-cancer agent

Cancer is a highly prevalent disease characterized by abnormal growth and uncontrolled division of cells. While many current treatments applied in medicine are powerful for killing cancerous tissue, most therapeutic strategies lack selectivity towards cancer cells and damage normal tissue. The search for an anti-cancer agent that possesses great cytotoxicity and high selectivity has led to the discovery of benzosuberene analogues, which are potent vascular disrupting agents (VDAs) that destroy tumor vasculature and deprive the tumor of nutrients. The purpose of the project is to synthesize a novel benzosuberene analogue that contains structural modifications, with the hope of obtaining a compound with greater antiproliferative potential. The project is ongoing; however, the reactions that had been performed were successful. The synthesis pathway suffers from low yield, thus the future direction is to modify the synthesis in order to obtain a greater efficiency. Upon the completion of the synthesis, the novel benzosuberene compound will be placed under biological evaluation to analyze its cytotoxicity and selectivity.

Kaleia Marsden, Studio Art

Heidi Hornik, mentor

The Inspiration behind Baylor's Architecture

My thesis is Baylor's architecture and the inspiration behind the classical elements seen in Pat Neff Hall, Memorial Dormitory and the Baylor Sciences Building. I have gathered my information from the Texas Collection, primarily. At this library, I discovered that Baylor President Samuel Palmer Brooks was an important factor in the classicism that the campus displays. From a paper detailing Birch Easterwood's life, the architect of Memorial and Pat Neff Hall, Brooks visited the New England area with Easterwood for the structure's inspiration. Furthermore, primary sources like an oral interview with Brooks' children and secondary sources such as newspaper articles revealed that inspiration also came from the University of Texas at Austin. I have reviewed many primary and secondary sources such as those above that detail President Brooks' influence on the architecture. Even the Baylor Sciences Building, created about 60 years after Pat Neff Hall, includes classical elements from this administrative building and Memorial Dormitory. I received an email from one of the architects on the project in which he told me, explicitly, the inspiration behind the design of the science building. The Baylor administration wanted the architectural firm of Harley Ellis to connect the science building to the other structures; thus uniting the entire campus.

Thomas McGraw, Philosophy and Religion

Natalie Carnes, mentor

Keeping Silent: The Ethical Place of Silence in Theological Communication

Although many people understand silence as a passive act, I argue that silence is a powerful practice that the church must properly integrate into its communication in order to speak truthfully into the world. To do so, I investigate the ways in which silence can be a form of power, albeit not in the commonly understood sense. Properly used, silence can be way to practice nonviolent resistance against violent communicative structures. Additionally, practicing silence is one way for humans to share in the life of God through the practice of listening. I then turn to examine the church's use of silence in communication. The church has frequently misused the power of silence, both silencing others and remaining silent when speech was necessary, practices that require the church to repent. Finally, I conclude by arguing that understanding silence as a way of communicating living truth provides the resources by which the church can properly integrate silence into its communicative practice, grounded in the practiced life of ecclesial communities.

Rebecca McHenney, Mathematics Education

Trena Wilkerson, mentor

An Examination of Qualities of Effective Urban PLCs Using a Case Analysis Approach

This study seeks to find key characteristics of effective Professional Learning Communities (PLCs) in urban schools. It springs from a body of research on the challenges that urban schools face, on education reform, and on implementation of PLCs (Darling-Hammond 2006; DuFour 1998; Hord 1997; Ravitch 2000; Vescio et. al 2008). There is a lack of research that combines the two fields of PLC implementation and urban school reform. This study seeks to fill that gap by analyzing five case studies from the literature (Dallas 2006; Hipp, Huffman, Pankake, & Oliver, 2008; Huggins 2011; McKenzie 2011; Wallace 2010) that describe the implementation of PLCs in urban schools. It develops a model of key characteristics of effective urban PLCs using a grounded theory approach as defined by Glaser and Strauss (1967). The findings indicate that effective urban PLCs are led by administrations who continue to regularly interact with the PLC even after it has been implemented. They exhibit strong

accountability structures in place, including focus, deprivatization, and effects on teacher beliefs. Effective urban PLCs also have strong support systems, with variety of support and administrative support being two major categories. This research indicates the importance of administrative leadership striking a balance in PLCs between putting pressure on teachers to improve their practice and providing the supports necessary in order for them to do so. In urban schools, where challenges are often many and resources are often few, these themes are especially important.

Connor Mighell, University Scholar

David D. Corey, mentor

A War of Freedoms: Addressing Modern American Rights Talk

Modern American rights claims spring from a wide array of historical, legal, and metaphysical sources, but these different sources often lead to radically different ideas about which rights are most important. This confusion within American “rights talk” has led to the assertion of conflicting rights in the public square and a corresponding political entrenchment by opposing sides. I study the current state of American rights talk by arguing that rights are essentially “protective capsules” placed around various freedoms that modern liberal society finds essential, but which are in many instances incompatible due to the evolving nature of liberalism itself. I also examine the difference between positive and negative liberty, and the importance of a proper understanding of liberty to a proper understanding of rights. Given the reality of conflicting liberties, citizens today need to engage in sustained political discourse to determine which freedoms are worth armoring as rights and which are not. I also recommend a return to the negative, true understanding of liberty.

Clayton W. Mills III, University Scholar

David L. Jeffrey, mentor

Regarding Death and the Afterlife: Christian Eschatology as a Product of Judaism and Hellenism

Christianity is very much a product of a mixing of cultures. Christ lived at a time of great mobility and social stability under the Roman Empire, and thus Christianity was born into a collision of Greco-Roman culture and Israelite culture. Naturally, there are some conflicts. One such area that saw great disparity of ideas was eschatology. Greek eschatology is centered around the idea of escape from the physical world, which is seen as inherently evil and corrupt. The eschatology of the Israelites was just the opposite - God created the world and it was good. Though mankind had broken God’s creation through sin, God’s people longed for the redemption of the world and a physical resurrection to restore God’s perfect order. Unfortunately, Christian eschatology is partially the product of these two incompatible worldviews. In this thesis, I will argue that many of the church fathers unknowingly and unwittingly brought into Christianity more of this Greek duality of the physical and spiritual worlds than is actually true. I argue that this crisis is further exaggerated by the Septuagint’s misuse of Hebrew eschatological terms without proper context. Finally, in this thesis I hope to direct modern Christianity back to its Hebrew roots, and instead of placing its deep longing in meeting God in heaven, praying fervently for the redemption, recreation, and resurrection of the physical world as a part of God’s ultimate victory over Death.

Erin Morgan, Political Science

Yousry Zakhary, mentor

How Chelsea Changed the Law

Sexual assault has always been an issue in the United States, but in recent years it has been given more attention due to high profile cases, new legislation, and recent initiatives, such as the White House's "It's On Us" campaign. While new legislation is being introduced, one must question why this new legislation is needed and evaluate the shortcomings of sex crime legislation as a whole. I have found that sex crime legislation in the past have been good laws in theory, but when their effects are studied, these laws have largely failed to fulfill their intent. The ineffectiveness of these laws have allowed sex offenders to use loopholes to their advantage and have not deterred first time offenders or curbed recidivism in the desired amount. The ineffectiveness of these laws has prompted the need for one of the strictest sex crime laws, Chelsea's Law. Chelsea's Law created a one-strike policy for sexual predators who commit the worst and most violent sex crimes against children while also revising other sex crime laws to improve upon their shortcomings.

Ali Mosser, Baylor Business Fellows, Marketing, and Business Spanish

Marlene M. Reed, mentor

The Revitalization of Elm Street

East Waco is a region of the City of Waco characterized by a somewhat rough history and a generally run-down atmosphere. Many Baylor students would be familiar with the area because of Lula Jane's, a popular bakery in the heart of East Waco located on one of the central roads, Elm Street. This project is an extension of a class project done by the 2014-2015 Baylor B.E.S.T. class, a group of twenty-eight highly motivated upperclassmen from various disciplines within Hankamer School of Business at Baylor University. In this project, the group researched, planned, and ultimately constructed a potential revitalization plan for the East Waco area, an area that financially lags behind other areas in Waco. This extension outlines in detail the research done, presents the final project and gives follow-up information on related happenings in East Waco that have occurred since the project was presented to parties involved in the future of business ventures in East Waco in December 2014.

Audrey Murchland, Anthropology

Lori Baker, mentor

Femoral Neck Axis Length (FNAL): Use in Biological Profiles of Deceased Undocumented Immigrants

Since 1998, the bodies of more than 6300 undocumented immigrants have been discovered along the US-Mexico border. The Reuniting Families Project (RFP) leads an effort to recover the remains of the unidentified and determine biological profiles for them. The standard methods used to make sex estimations, however, were shown to be inaccurate when looking at those considered Hispanic. Because these individuals make up the majority of RFP's cases, it is essential that new methods with high classification rates be found. This study examined the femoral neck axis (FNAL) as a new, potentially accurate method in estimations of ancestry and sex for undocumented border crossers (UBCs). Comparing 87 American Black, 108 American White, 91 Native American, and 58 UBC samples, FNAL showed very low discriminant function classification rates when examining ancestry, ranging between 34.7% and 40.4%. When looking at sex, however, FNAL provided classification rates ranging from 83.4% to 91.4%. The sectioning point calculated for UBCs, in particular, provided an averaged classification rate of 89.85%. The results of this study show considerable promise for the future use of FNAL in forensic anthropology.

Kelsey Murray, Baylor Business Fellows and Management

Chris Pullig, mentor

A Study of Hedonic Marketing and Why Disney Parks Are So Good At It

The Walt Disney Company includes several incredibly successful theme parks, and they have succeeded in providing a one-of-a-kind experience to their customers. While the purchase of a typical Disney product, like a movie, might arguably be considered purchasing an experience, the experience happens in uncontrolled environments. However, Disney Parks have the opportunity to control the experience and thereby influence current opinions and future purchases. Through a review of literature on the subject and a consumer survey, this study attempts to uncover the part that hedonic marketing, or experiential branding, has played in Walt Disney World's success and to generalize the findings into recommendations for any company wishing to market this way.

Thomas Jack Neathery, University Scholar

Greg Garrett, mentor

All the Living and The Dead

During Easter Week of 1916, Dublin was caught off guard when nationalist militants barricaded themselves within key buildings throughout the city. Although the British military crushed this rising, the memory of this event, which would later be called the Easter Rising, would spark a century long struggle for Irish independence. In the words of W.B. Yeats, "a terrible beauty is born." My thesis is a screenplay that enters into this historic event. It follows James O'Leary, a professor at Trinity College, as he attempts to steer a friend's son away from nationalistic ambitions. Both men, however, find themselves within the rebel headquarters when the fighting begins, and they must join the rebels against the British in order to survive. The two main characters are very different from one another, and thus a major theme in my screenplay is "perspective". I lead two characters with imperfect points of view through a common narrative in order to demonstrate how their beliefs and attitudes toward Irish nationalism might become richer and more complete.

Nicholas Neuwald, University Scholar

Patrick Danley, mentor

Examination of geographic variation in male melanistic color pattern in the Lake Malawi Maylandia zebra cichlid species

The purpose of this thesis project is to examine geographic variation in male melanistic color pattern in the Lake Malawi cichlid *Maylandia zebra*. *Maylandia zebra*, like other members of Lake Malawi's rock-dwelling cichlid clade, are highly philopatric, meaning very few individuals migrate into or out of geographically isolated populations. The genetic isolation of these populations may facilitate their phenotypic differentiation and contribute to the extraordinary rate of speciation observed in this system. I will test the hypothesis that populations of *M. zebra* are phenotypically isolated by examining the within and between population variation in male melanistic pigmentation. Specifically I will quantify bar density and pigment intensity from photos of *M. zebra* from differing locations in order to quantify phenotypic variation. Next, I will test the hypothesis that geographic variation in pigmentation pattern is correlated with environmental conditions at each site. To do this, I will quantify the number of rocks for the location of each population. I predict that populations with larger than average melanistic patterning will live in habitats with many smaller rocks. This analysis will provide insight into the ecological forces influencing population differentiation of Lake Malawi cichlids and may inform on the speciation process in this system.

Katherine Novak, History

Beth Allison Barr, mentor

Medieval Mysticism: Women's Agency Through Contemplation

Contrary to the belief that women who chose lives of secluded religious contemplation were repressed by a male-dominated society, Women Religious actually demonstrated a great deal of agency. According to historian Phyllis Mack, women who enclosed themselves due to religious conviction actually exercised greater agency than most women in medieval society. The belief that their visions were divinely inspired gave them the authority to pursue their own interests outside of society's expectations for them and to engage with leading theological figures throughout Europe. An examination of the lives and writings of Christina of Markyate, Julian of Norwich, and Margery Kempe indicates that each woman drew on the lives of early Christian holy women, as found in the *Gilte Legende*, and popular sermons to shape their stories. The longevity of their influence proves that their religious choices gave them the ability to exercise an exceptional amount of agency.

Britt Ousley, University Scholar

Kevin Funderburk, mentor

Magic, Sorcery, and Sacraments: Combating and Using the Supernatural in Ancient Christian Literature

In the first four centuries of this era, Christians of the Greek-speaking Roman world displayed a range of attitudes toward rituals and behaviors which they labeled as "magical," i.e. as *mageia*, *goeteia*, or *pharmakeia*. Christian responses to these phenomena and the related terminology range from outright condemnation to self-description. This thesis examines the use of words pertaining to "magical" practice in literature from the first several centuries of the Church, including passages from the didactic texts of the Apostolic Fathers, the novelistic Apocryphal Acts of the Apostles, and the stories regarding Jesus in the Apocryphal Gospels. Patterns of behaviors and contexts associated with Greek "magical" vocabulary are explored in these texts in order to argue that these authors believed their sacraments were in direct conflict, even combat, with the demonically driven, "magical" sacraments of pagan religion.

Grace Hillary Pardede, Marketing

James Roberts, mentor

Homesickness Among International College Students: The Impact of Social Embeddedness and Connection to Home

The number of students choosing to attend a university outside of their home country is continually growing. Although studying abroad may be an exciting transition for international students, with cultural relocation comes elevated psychological distress. Such distress occurs due to cultural variations, which may increase levels of homesickness among international students. As such, this study aims to investigate two major factors influencing homesickness among international students: social embeddedness and connection to home. This study provides an introduction including background information on homesickness and its negative effects. Secondary research outlines the psychological impact of greater connectedness to home, and low levels of social embeddedness experienced by international students. These findings developed a survey and analysis of measurable scales of connection to home, social embeddedness, and homesickness. The final conclusion indicates that there is an inverse relationship between homesickness and social embeddedness. Meaning, as students become more acculturated to their host country, their level of homesickness decreases. Additionally, connection to home is positively correlated with levels of homesickness. From this study, health care professionals and homesickness prevention programs are given relevant findings, encouraging them to focus more of their services on providing social support for international college students that will alleviate the emotional toll that homesickness may bring.

Alex Parker, Religion

Blake Burleson, mentor

An Examination of the Use of Scripture by Representative American Evangelical Christians to Understand the Eternal Destiny of Non-Christians

"Who goes to heaven?" For centuries, this question has been answered from the pulpit by evangelical Christian pastors. For evangelicals, the principle authority for seeking answers to this question, and for all questions in matters of faith, is the Bible. The Reverend Billy Graham's use of scripture is representative of many, perhaps most, evangelicals today. Yet new evangelical voices have emerged that use scripture to come to different conclusions. Two of these voices, the Reverends Rob Bell and Brian McLaren, have found a receptive evangelical audience. This thesis compares Graham's use of scripture which leads him to an exclusivist eschatology with that of Bell and McLaren which lead them to a universalistic eschatology. Historically rendered incompatible, this thesis demonstrates that while exclusivism and universalism are different in their eschatological conclusions; that each camp can learn something from the other.

Rachel Pearce, Psychology

Tamara Lawrence, mentor

Skin-deep: Analyzing Whether Attractiveness Affects Rejection Responses in Unrequited Love

This study examined experiences of unrequited love by exploring the effects of attractiveness, gender, and race on rejector responses. The sample (N = 142) of Baylor undergraduates completed a survey that contained a stimulus person picture and a hypothetical scenario in which they were rejecting a would-be lover. The attractiveness, race, and gender of the stimulus pictures were manipulated to assess the emotional and behavioral responses in different conditions. As expected, attractiveness had a main effect on most of the factors, indicating that treatment of would-be lovers varies depending on attractiveness. We also found 2-way effects with race and gender, as well as attractiveness and gender. There was only one 3-way effect for attractiveness, race, and gender, related to how rude rejectors' responses were. Further, factor responses in the Basic Needs Satisfaction Scale were correlated to the emotional and behavioral responses, demonstrating the importance of considering Self-Determination Theory when analyzing how people relate to others.

Emily Peirce, Mathematics

Markus Hunziker, mentor

Nature through the Lens of Number Theory

Though we might not recognize it, mathematics is manifested in the world around us. To begin to see an example of this, we first develop the theory that links together the Fibonacci numbers, the Golden Ratio, and continued fractions to ultimately present some well-known (and some less well-known) results on the best approximation of irrational numbers by fractions. Armed with this theory, we then examine the mechanics behind plant growth and discover surprising connections between mathematics and flower development. Through an in-depth understanding of the mathematical tools and number-theoretic results initially outlined, we are brought to a deeper appreciation of the Creation that surrounds us as we recognize the order and pattern that exist in the natural world.

Hannah Popp, Communication Sciences and Disorders

Jungjun Park, mentor

Preliminary Efficacy Study of a Conversation English Partners Program for Enhancing Psychosocial Life Quality in International Graduate Students

International students provide educational institutions with a number of benefits culturally, socially, and academically. However, past research demonstrates that international students in the United States face a number of psychosocial stressors, academic and cultural challenges that are related to being in an unfamiliar educational or life environment including acculturative stress, and issues with psychological and social adjustment. In addition to the pressures placed on them to succeed socially and academically in a foreign culture, many graduate international students are expected to teach various levels of undergraduate classes. Sometimes, their lack of polished American English can result in communication barriers. The frustration that results from this can cause depression, embarrassment, or a lack of confidence in their teaching ability. This empirical study explores (i) the psychosocial stresses that are experienced by bilingual Asian international graduate students as a result of language barriers using a comprehensive self-reporting/self-rating questionnaire, and (ii) the efficacy of a task-based, structuralized English-learning service by assessing the pre- to post-service improvement of psychosocial status and spoken language accuracy. This study implements a program of conversational English learning that includes activities that are already widely used in other universities. If indeed the participating graduate students report improved feelings of confidence and satisfaction, it would provide evidence to support the assumption that the implementation of these types of programs is effective in the university setting.

Caryn Pyle, University Scholar

Julie deGraffenried, mentor

Terri Schiavo's Right to Die: An Overview of the Euthanasia Movement in 20th Century America

The field of medical ethics has seen a tumultuous development in the 20th century. The Nuremberg Trials of the late 1940s contributed greatly to the standard of medical ethics by addressing the atrocities committed by the Nazis during World War II, particularly in regards to euthanasia and medical experimentation. From modern day to the Nazi era, the ethics regarding euthanasia have been contested and standards have been set that show that the issue has seen great growth from World War II to today. After setting an ethical standard through the Nuremberg Code, the issue of the legalization of euthanasia in the United States entered the public discourse throughout the remainder of the 20th century. Through powerful leaders and various national and global events, support for the euthanasia movement grew, reaching the point of legalization in favor of physician-assisted suicide in Oregon in the late 1990s. An important case for the euthanasia movement is that of Terri Schiavo, a young woman who fell into a vegetative state that led to a national legal battle in the early 2000s over her right to die. Through her husband's efforts, Terri was granted the withdrawal of a feeding tube, a form of passive euthanasia. The outcome of Terri's case demonstrated how much progress the euthanasia movement had made in the United States since World War II and how the ethical perspective of most Americans grew to encompass the right to die.

Hannah Quinn, University Scholar

Julie Holcomb, mentor

The Permanent Impermanence Project: What Role Can the Museum Play?

Street art and graffiti in the public conscience is a topic that is often left out of academic journals. The need to find a way to preserve this art form is the key concept at the heart of this project. While online documentation plays a significant role in this process, I am primarily interested in the possible role of the museum in the preservation

process. Even though I am advocating museum involvement in the world of street art and graffiti, I am in no way suggesting that the process is as simple as taking the work off of the streets and putting it into a “sterile, disinfected gallery or a restrictive museum.” The context of this art form is as important as the actual content. That being said, museum professionals have certain skills and backgrounds that can help the street art and graffiti community grow and further connect with the culture and environment around them. To do this though will require a rethinking of what it means to be a museum.

Jeremy Quintana, Biochemistry

Bob Kane, mentor

Antibody-drug Conjugates as Vaccines

Vaccines have been used for more than a century to trigger a preemptive response of the adaptive immune response against a specific pathogen. There can be many ways to provide this immune response, either through the production of cytokines or production of antibodies. This response is achieved through the introduction of a viral agent that is typically in the form of a weakened or killed portion of the virus. The body is able to identify this agent, known as an antigen, and prepare an appropriate response should the immune system come in contact with the active virus. This classical form of vaccine is known as prophylactic and is meant to prevent or reduce the effects of future infection. This thesis presents a modern attempt to create vaccines that do not have the same shortcomings as traditional vaccines, and may even be more effective at stimulating the immune response. Antibody-drug conjugates have been explored only within the last 20 years as a viable option for the replacement of classical prophylactic vaccines. My research is focused on the development of a TLR7-pathway stimulating vaccine through the use of an agonist-antibody conjugate. Both the synthesis of the agonist and conjugation method are included in this thesis.

Alexandra N. Reed, Biology

Eva Doyle, mentor

A study of children's health in urban Brazil

A primary global issue is children's health because it creates the basis for future health outcomes and contributes to a person's productivity and economic contribution. Health knowledge of parents, or more specifically of mothers, contributes to children's health. The purpose of this pilot study was to explore health-related issues among parents in two underserved communities in the state of Espirito Santo, Brazil. This study was conducted as part of a Baylor University partnership with Brazilian Baptist Churches whose leaders are interested in promoting health in their neighborhoods. Study participants (n=33) completed a written survey designed to measure age, education, number of children, and primary source for health information. The participants also engaged in one of three focus groups through which three basic questions were used to explore parental perceptions about children's health and future health education. Results from survey response frequencies and percentages were compared to focus group outcomes, and used to understand primary health issues faced by the studied communities.

Megan Renz, University Scholar

David L. Jeffrey, mentor

The Communal Conscience of William Langland's Piers Plowman

William Langland's *Piers Plowman* personifies theological, moral, and psychological faculties, one of which is conscience, within a series of poetic dream visions. The semantic field of *conscience* evolved considerably between the classical and modern ages, moving from the concept of a morally neutral record keeper within the individual or a community, to a concept of internal or external lawgiver. I contend that Langland's conscience is located between the classical and modern word usage, and that it is communal in nature, i.e. a moral faculty that intrinsically and inextricably links the individual to his surrounding community. The role of Conscience in the interior community of the soul shows conscience's formation, its fallibility, and its authority by virtue of its relationship to the community of the Trinity. The role of Conscience depicted alternately as a place through which persons must travel in their journey toward Truth, the place at which "Christ will prove truly / that [a man] love[s] the Lord our God above all else," speaks of Conscience's participation in a scheme of salvation that is fundamentally co-operative, and thus of Conscience's own co-operative nature. Conscience's denunciation of Lady Mede reveals his authority to engage socio-economic matters in defense of justice: he defends traditional moral frameworks in the face of the intensifying profit economy. Finally, his kingship over a Christendom attacked exhibits his authority to call the community to holiness in an apocalyptic vision, as well as his innate fallibility and reliance upon the Trinitarian community. In all of these aspects, Conscience may be demonstrated to be communal.

William Richards, Electrical and Computer Engineering

John Miller, mentor

Four channel bidirectional motor position control on the MSP430

This project explores the initial development of a four channel bidirectional motor control for the Texas Instruments MSP430F5529 Launchpad. Motor control is one of the most common tasks for an embedded microcontroller to perform. Chip manufacturers are keen to capture the hobbyist and do-it-yourself (DIY) microcontroller market, to encourage development of commercial products in their ecosystem. As a result, development boards have readily available modular expansion boards for common tasks. A survey of popular hobbyist retailers revealed that most available motor control expansion boards for hobbyist microcontroller development boards are limited to control of four motors with single direction control, or two motors with bidirectional control, and offer no position feedback. The result of this project is a circuit and driver package that allows control of four motorized linear potentiometers, including resistive position feedback, storage, and recall, as well as an interrupt. The resulting package is intended to be released and maintained by the open source community.

Lauren Roddy, University Scholar

Lisa Baker, mentor

She said, he said: Discrepancies between Females and Males in Reproductive Health Knowledge, Attitudes, and Behavior in a Traditional Community in Rural Western Kenya

Eastern Africa carries the highest burden of unplanned pregnancy worldwide. The Luo tribe of western Kenya additionally faces the highest rates of adolescent pregnancy, infant mortality, maternal mortality, and HIV transmission in Kenya. This region also claims the highest unmet need for family planning globally, and, even where family planning services are available, they remain underutilized. Though numerous studies have been

conducted regarding women's views and behaviors in regards to the poor maternal and child health in this region, the male perspective has been nearly entirely absent from this dialogue until recent history. There is a particular dearth of research regarding the similarities and differences between male and female knowledge, attitudes, and behaviors regarding reproductive health. This study is a secondary analysis of data from two prior cross-sectional studies of the self-report of 112 Luo women and 50 Luo men from rural Kenya regarding reproductive health, family planning, and sexually transmitted diseases. Despite Luo women being regarded as the essential source of all health information for their community, results showed that only 8% of women had even a basic knowledge of reproductive health, in surprising contrast to 36% of the men. In addition, both men and women stated that husbands and wives primarily consult one another in order to make family planning decisions, however they were also found to have discordant cultural beliefs regarding appropriate family size, family planning methods, forced sex, and HIV/AIDS prevention. These findings highlight the complexity of implementing change in sexual and reproductive health behavior in traditional, resource-poor communities, and future initiatives will need to address both a lack of knowledge and differing cultural beliefs among men and women.

Brianna Rogers, Interior Design

Michelle Brown, mentor

Interior Design for Assisted Living Communities

As the Baby Boomer generation retires over the next two decades, there will be a great need for a new place for them to call home that offers the opportunity for medical assistance as needed. As such, assisted living facilities are on the rise within the healthcare industry, providing a comfortable and familiar environment for the elderly who are no longer able to live entirely on their own. These facilities incorporate private apartments in addition to amenities and various gathering areas for social interaction amongst residents. Special considerations must be made for the aging population, due to common conditions such as poor vision, wheelchair confinement, and general mobility and strength impairment. A study of gerontology and evidence-based research on successful assisted living facility designs provides an essential basis for determining the needs of the elderly users of a space.

Personal interviews with existing facility residents offer an internal perspective on the desires of the population for which these facilities are designed. By considering both the needs and desires of the users, a well-designed assisted living facility can be both accessible and beautiful, truly becoming a new home for its residents.

Olivia Rowland, Forensic Anthropology

Andrew Wisely, mentor

The Impact of the Great Recession on White-Collar Crime

From December of 2007 until June of 2009, the United States suffered from the 'Great Recession'. Due to the recent Great Recession, the motivation to commit white-collar crime has increased. This thesis analyzes national economic and crime data from 2005 to 2012 in an attempt to find a correlation between the Great Recession and a rise in white-collar crime. Also, this thesis delves into the role of females in white-collar crime. Data primarily from the Federal Bureau of Investigation, Department of Justice, and Bureau of Justice Statistics were used in this thesis covering the fluctuations of fraud, embezzlement, forgery, and counterfeiting.

Ashlyn Royall, University Scholar

Ivy Hamerly, mentor

The 2014 Scottish #IndyRef: How Failure is Still Progress for Scottish Nationalism

In September of 2014, Scots voted in a referendum on Scottish independence from the United Kingdom. Though the unionist vote won by a slim margin, the campaign had become much closer than expected. In what seemed like a last-ditch effort to maintain the union, the UK government promised further devolution of power, what they called “max devo,” to Scotland if they stayed a part of the union. In this thesis, I analyze the development of the Scottish nationalist movement and the progress of the 2014 independence referendum to draw conclusions about what economic and cultural factors affected Scottish support for independence. Then, I explore what these conclusions likely indicate for the future of British constitutionalism and Scottish nationalism.

Amanda Sawyer, University Scholar

D. E. Mungello, mentor

'Women's Work for Women': Annie Jenkins Sallee in China

The growth of feminist movements in the wake of the American Civil War inspired the development of foreign missionary work as an acceptable and desirable career for young single women. Southern Baptist Annie Jenkins Sallee took up such a career after becoming the first woman to receive a master's degree from Baylor University. She journeyed across the world with the intention of rescuing Chinese women and girls from what she saw as the depths of degradation which years of sinfulness and cultural repression had plunged them into. Sallee worked primarily among young girls and women in China through the establishment of preparatory day schools, a boarding school, and an industrial school for women. Her work clearly produced positive results with regard to increased literacy among Chinese women. Yet, as this work seeks to show, these results must be viewed within the context of issues related to gender, race, and class.

Catherine Schenck, Classics

David White, mentor

Dressing the Part: The Costume of Roman Women

Although women in antiquity are often perceived as suppressed and inferior by modern readers, Roman women played specific roles in society. They were daughters, with the hopes of advantageous marriages, brides, transitioning into the next stage of their life, *matronae*, married women tending their home and raising their children, and priestesses, responsible for the religious well-being of the state. Each woman performed her own responsibilities, fulfilled her societal expectations, and wore a specific costume. Clothes and hair adornment were a key features in distinguishing the levels of social and moral hierarchy within the Roman world. They could symbolize a transition from one phase of life to another or idealistic qualities, such as chastity, modesty, purity, and *pudicitia*. Using my own translations of ancient authors, unless otherwise noted, and the visual representations of women in art, this thesis analyzes how the costumes of two “ordinary” women, young girls and *matronae*, and two “unordinary” women, brides and the Vestal Virgins, reflect their status, class, and identity. Dress was not only a form of expression, but a symbol of women's roles in society.

Chad Scott, Biochemistry

Bill Neilson, mentor

Two Americas: The Effects of Single Motherhood on the Racial Disparity in American Life Expectancy

Throughout American history, a significant gap in longevity has existed between the black and white populations of the United States, creating the potential for “two Americas” to arise. For decades, the average white individual has been projected to live at least 7.6 years longer than the average black individual. In that time, single motherhood has increased nearly 8 times in its prevalence since the 1960s, particularly in the American black family. Over the past few decades, females headed a vast majority of black households, while (until recently) females historically headed only a minority of white households. Because of this stark contrast in family structure between the black and white populations, this thesis proposes that single motherhood—through a variety of factors affecting a person’s life—is at least partially a contributor to the persistent racial gap in American life expectancy today. By decreasing the amount of non-marital births in America, more opportunities arise for children to climb in social status, potentially enabling them to close the racial gap in life expectancy that has plagued the United States for decades.

Aleksandra Shylo, Marketing

David A. Smith, mentor

On the Integration of Art and Marketing: How Popular Culture Transforms High Art in the Cause of Advertising

The purpose of this work is to explore the relationship between high art and the world of marketing by analyzing the way popular culture co-opts high art in the cause of advertising. As the utilization of high art in marketing increases, high art itself is reduced to a mere object that can be used, inducing the perception that high art is no more than an image that can be manipulated. Thus, our increasingly commercialized society develops a growing disintegration of the integrity of taste due to the blurring of the lines separating art for art’s sake and art for marketing’s sake, dulling our ability to distinguish between the intrinsic and instrumental value of high art. Through the analysis of the history of art in advertising, Modern and Pop art’s contribution to the materialization and the increasing prevalence of the use of art in promotion, this work seeks to discover the causes of the increasing commercialization of high art and the evolution of the public’s perception of art and its role in society.

Will Simmons, Neuroscience

Lisa Baker, mentor

A Cross-sectional Study of the Relative Effects of Nutrition and Water Quality on Child Body Size in a Rural Kenyan Community

An adequate, diverse, and nutritious diet is critical to early development. Due to a number of factors, however, access to quality food sources is limited for much of the developing world. This research study investigates the relative extents to which nutrition and water quality are associated with child body size on the Nyakach Plateau in rural western Kenya. Survey responses indicate widespread hunger, with nearly half of the sample (n=172) indicating the highest level of acute food insecurity (FI). Acute FI was associated with lower weight-for-age z-scores (WAZ; $R^2=0.2213$, $F=7.53$, $p<0.0001$), an indicator of short-term development, but not with height-for-age z-scores (HAZ), an indicator of longer-term development. Survey responses also reveal that, on average, children’s percent of calories from protein were only a fraction of the 20 to 35 percent recommended for children ($\bar{x}=0.035$, $SD=0.038$). Higher percent protein intake was significantly associated with higher WAZ ($R^2=0.16$, $F=10.23$, $p<0.0001$) and HAZ ($R^2=0.10$, $F=5.75$, $p=0.0042$). Finally, a combined model of acute FI and percent protein intake was significantly associated with WAZ ($R^2=0.31$, $F=9.29$, $p<0.0001$). However, when a combined model of acute FI

and percent protein was tested for association with HAZ, the FI measure remained insignificant. Preliminary analyses have indicated a possible role for gender in the relative effects of nutrition and water quality on child body size.

Christopher Skrodzki, Biochemistry and Biology

Joseph D. White, mentor

Spelunking the Leaves of The Paleozoic: Exploring the Influence of Morphology on Plant Gas Exchange

Paleozoic leaf gas exchange was examined in response to recent suggestions that plant stomatal characteristics are proportionate to Earth's past and present atmospheric carbon dioxide concentration. Between the middle-late and early-late Pennsylvanian epoch (307 MYA), of the Carboniferous era, it has been also demonstrated that a relatively rapid (across several hundred thousand years) shift in Earth's climate drastically reorganized the distribution of Euramerican equatorial flora from diverse wetlands to ones dominated by giant fern canopies. This rapid shift in hydrological cycling potentially has led to longest period of worldwide glaciation known to geological science. This period is climatologically critical as levels of carbon dioxide were approximately that of modern levels (420 ppm), yet oxygen levels were approximately 10% higher than modern levels (20%) era. Lycophytes have been demonstrated to have evolved during the middle Devonian era (370 MYA). The genera *Selaginella* and *Lycopodium* are polyphyletic, representative of the orders Selaginiales and Lycopodiales, and thus both harbor adaptations that allow drought survival. While additionally, the morphology of the model organisms, *S. krausiana* and *L. lucidulum*, is representative of the Pennsylvanian epoch via the presence of tracheid structures and apparent lack of spongy mesophyll tissue, commonly found in angiosperms. The effect of a Paleozoic atmosphere was simulated within laboratory conditions via an increase in air pressure to meet those of late Carboniferous levels (300MYA) between 200 feet below and at sea level, 104kPa. Results from this investigation indicate marked differences in gas-exchange and Photosystem II activity potentially due to differences in stomatal morphology between Pennsylvanian model organisms, suggesting different ecological niches before and after the middle-late Pennsylvanian transition.

Rachel Slate, Psychology

Sara Dolan, mentor

Marijuana Dependence: Predictability From Levels of Impulsivity and Schizotypy in College-Aged Students

In this empirical investigation, an online survey was administered to 1,797 undergraduate students assessing the relationship between marijuana use, impulsivity, and schizotypal personality traits. Correlations revealed statistically significant relationships between total marijuana dependence symptoms and three subscales of the Schizotypal Personality Questionnaire (SPQ; Ideas of Reference, Odd Beliefs or Magical Thinking, and Unusual Perceptual Experiences). Significant correlations were also found between the attention subscale, the motor subscale, and the non-planning subscale of the Barratt Impulsiveness Scales and the same three subscales of the SPQ. Three hierarchical linear regression analyses revealed that scores on three subscales of the SPQ were weak predictors of marijuana dependence after controlling for scores on the three BIS subscales. Implications for these findings are discussed and recommendations for future research are made.

Matthew Smith, Political Science

David D. Corey, mentor

Liberalism and Christianity

What is the relationship between liberalism and Christianity? In this thesis, I analyze this question from both a historical and philosophical perspective. Historically, liberalism owes something to Christianity, as liberal ideas were encouraged by the Reformation. However, we have reached a point today in our liberal culture where it seems that Christianity and liberalism are at odds. Examining works from Guido de Ruggiero, John Locke, Ludwig von Mises, LT Hobhouse, Alan Wolfe, as well as Supreme Court jurisprudence on religious free exercise, I trace the relationship between liberalism and religion over time. Ultimately, I argue that liberalism has become increasingly intolerant toward Christianity as a result of the liberal temper. This temper places the pursuit of freedom over any specific belief practices. Today liberals may seem to expect religious believers sacrifice their convictions for the sake of the next freedom. In the end, both liberals and religionists bear a responsibility to address this dilemma moving forward.

Kathryn Sommers, Studio Art

Sarah-Jane Murray, mentor

Untitled Screenplay

Animated movies by Disney and Pixar make millions of dollars every year. Great stories and great art capture audiences and can create a cultural movement, as evidenced by *Frozen*. This impact and its importance in society prefaces the bulk of my thesis, which is a screenplay inspired by Renaissance Disney movies. My story follows a princess as she learns the responsibility of power. With adventure, betrayal, and romance, Princess Valerie matures into a worthy ruler of her Germanic kingdom Edelstein. I hope this story will inspire and encourage young men and women to be strong yet responsible and humble.

Ivy Stejskal, Biology

Bill Neilson, mentor

Death with Dignity: The Future of Catholic Healthcare in Texas Regarding End of Life Policies: The Texas Advance Directives Act of 1999 from a Catholic Perspective on Sanctity of Life

The Texas Advance Directives Act of 1999 was a law that was created with the intention of adding order to the chaos that surrounded end of life care disputes. This act allows a physician to discontinue life-sustaining treatment if an ethics committee decides that the care of the patient is futile. Futile is termed as pointless or fruitless. The Catholic Church has very strict and set doctrine on how end of life issues should be handled as well as what constitutes a human person. The Catholic Church also has set doctrine on how to preserve the sanctity of a person even in the hours of death. My thesis will assess both the laws in place in Texas as well as the teachings of the Catholic Church regarding end of life care. Through this understanding, we will address certain case studies and how each of these would have been decided using the ERDs, TADA, and a combination of these two documents as a guide. After discussing the relations between politics and religion and how this impacts the delivery of end of life care, I will present the reason behind why an issue like this is important to me as well as my audience. There are faces and names behind all of the data and end of life care statistics. This thesis was designed to advocate for people in their last hours here on earth.

Nicole C. Stelter, Entrepreneurship and Marketing

Chris Pullig, mentor

Marketing Globalization in Regards to Advertising Techniques: With a Focus on the United States and the United Kingdom

Advertisements of the United Kingdom tend to be more indirect and liberal compared to the hard sell strategies of US advertisements due to cultural differences. By understanding the background and history of advertisement as well as the cultures of these particular regions, their variations become clearer. However, these differences should decrease overtime due to globalization and the increase of common world culture. In addition to increased communications between different cultures, there is also a development of culture with no tie to a specific territory. This theory of the globalization of advertising is tested in Chapter Four through individual qualitative interviews and larger-scale quantitative surveys to determine if actual commercial advertisement is similar across these cultures.

Amanda Stevens, University Scholar

Stephen Trumble, mentor

Bowhead Whale Earplug Indicates Lifetime Profile through Cortisol Composition

In nature, there are several proxies used in aging; there are coral and carbon signals, sediment and ice cores contaminants, dendrology in trees, and whale earplugs. For over a century, whale earplugs have been used as a proxy for age in baleen whales .[14]. Whale earplugs contain wax that is accumulated and preserved over a lifetime and because feeding and fasting from migration patterns results in different colored waxy secretions, the age of the whales can be estimated. . Thus far earplugs have been recovered in some baleen whale species as well as the sperm whale (a toothed whale). It was previously thought that the bowhead whale (*Balaena mysticetus*) did not produce earplugs. However, this research reveals that the bowhead whale does produce earplugs and that these earplugs can be used as an aging matrice. Our findings come from a bowhead whale believed to be a female 50-year-old whale. Previous research using a blue whale earplug determined that aging consists of counting light and dark lamina laid down biannually. Using gross morphology analysis of this female bowhead plug it was discovered that lamina do not follow this pattern. A novel technique was developed to separate the bowhead lamina;the earplug was first frozen and then soaked in formalin to begin separation between lamina. The laminae were then separated manually and continually dessicated to maintain sample integrity. This process revealed 65 distinct laminae, which were analyzed for cortisol and testosterone composition. The objective of this thesis was to determine a method to separate lamina in a bowhead whale earplug.

Marsha Suliman, Biology

Chris Kearney, mentor

Sugar Based Delivery of Spider Toxin for Mosquito Control

Mosquito-borne diseases, such as dengue fever and malaria, have become increasingly prevalent issues, especially in humid communities where mosquitoes thrive. Therefore, it has been necessary to seek out and develop ways to inhibit such diseases from spreading from their pest host. One such way is to target and kill mosquitoes that would be likely carry the diseases through the use of spider toxins. Toxins were inoculated into tobacco plant proteins to be expressed. To test each toxins effectiveness against the mosquitoes, it had to be injected into a solution to be fed to *Aedes aegypti* mosquitoes. Assays were performed, and the number of mosquitoes that had imbibed the solution and subsequently died was counted over a fifteen day period. It was found that a sugar bait solution consisting primarily of sucrose was an effective bait to attract the mosquitoes. Its effectiveness could be attributed

to the fact that sucrose is a key factor in mosquito growth and development. Future studies could include further examination of toxin stability and effectiveness in other sugar solutions and delivery systems. Similarly, other toxins and proteins, such as hydrophobin, could also be tested for their stability in sugar bait.

Lewis Tandy, Political Science

Rebecca Flavin, mentor

Looking Forward: What are the Implications of Windsor on Section 2 of the Defense of Marriage Act (DOMA)?

In *US v. Windsor* (2013) the Supreme Court ruled that Section 3 of DOMA violates the Fifth Amendment Equal Protection Clause, meaning the federal government can no longer refuse to recognize same-sex marriages that are deemed legal under state law. Some scholars argue Windsor foreshadows the inevitable demise of Section 2 of DOMA, which currently permits a state to both define marriage as between one man and one woman and to refuse to recognize same-sex marriages consecrated outside its boundaries. On the contrary, in this thesis I will argue that Section 2 of DOMA is perfectly consistent with both constitutional and legal precedent, as well as the decision made in Windsor. Furthermore, Windsor has no dire implications on a state's right to define marriage when one considers principles of federalism.

Mitchell Todd, Psychology

Keith Sanford, mentor

The Family Resiliency Index: Examining a New Measure of Family Resiliency and its Relationship with Child Outcomes After Stress

Family resiliency is the extent to which the relationships between family members has adaptive characteristics that facilitate an individual's, dyad's, or system's ability to cope with stressful life situations. Current theory suggests that family resiliency may have multiple components, yet, it is not clear which components are most important. Moreover, sub-scales on instruments designed to measure different components of resiliency are often highly correlated, thereby failing to demonstrate meaningful distinctions between the presumed components. A new model for assessing resiliency was developed by Sanford (2014), who first identified a pool of resiliency components that people naturally notice in their relationships after a stressful event, and used this pool to construct an instrument measuring two distinct dimensions of resiliency defined by positive and the other defined by negative family behaviors. This project is the first step in testing the new measure of family resiliency. Participants included 135 college students who completed an online questionnaire in which they recalled a stressful event from their childhood, completed retrospective ratings of both the new and previously established measures of family resiliency, a measure of parenting style, and outcome measures for well-being and externalizing behavior problems around the time of the stressful event. The new measure of resiliency included two scales and is unique in its design. Participants were prompted to recall a specific memory of a positive or negative behavior and write a short description before rating the behavior's frequency on a 6-point scale. The new measure's positive and negative scales were not significantly correlated with one another, supporting its divergent validity. Both scales were strongly associated with other measures of family resiliency. Furthermore, the new measure's relationships with outcome variables were still significant after controlling for the effects of parenting style.

Kady Valois, Social Work

Jon Singletary, mentor

Discovering Jyothi: How Changing the way Disability Legislation is Enforced can Improve the Lives of Children with Disabilities in India

By 2025 India will overtake China as the country with the largest population in the world. The World Bank in 2007 noted that the prevalence of disability in India could be as high as 80-90 million individuals by that time. Of that number a large majority are children. Children with disabilities in India often face discrimination and stigma resulting in them not receiving the necessary education and medical care needed to become well-rounded successful members in society. This piece outlines the current state of children with disabilities in India today, examines Hinduism's role in the discrimination of individuals with disabilities, and the history of disability policy in India. Lastly this piece examines the tenuous balance between policy and policy implementation and argues that with better policy implementation and education the overall livelihood of children with disabilities could be improved.

Juan Vargas, University Scholar

Charles Weaver, mentor

Students with Learning Disabilities: A history, analysis of current interventions, and recommendations for future study

In the United States, there is a growing gap between learning disabled students and their non-learning disabled peers in areas of academic achievement and graduation rates. Since the inclusion of learning-disabled students in public education on a large scale following the Rehabilitation Act of 1973, many interventions have been tried to help learning disabled students achieve higher success in postsecondary education, but not all have been successful and no panaceas have been found to alleviate the issue. In this review, the history of the laws that gave rise to students with learning disabilities is reviewed and several accommodations and interventions are examined. In addition, the practices at Baylor University are examined and trends in the number of students choosing to take tests at the alternate testing facility are analyzed. Finally, recommendations are made as to what possible solutions might be and what studies would be important to pursue in the future.

Rachel Ward, Psychology

Janet Bagby, mentor

Self-Management for Young Children with Autism

Previous research has indicated that self-management interventions may play a crucial role in helping children reduce off-task behaviors within learning environments (Briesch & Chafouleas, 2009). The self-management process allows participants to set personal goals and self-monitor such goals (Briesch & Chafouleas, 2009). The present study implemented a self-management intervention with two young boys diagnosed with Autism. Specifically, the intervention aimed to decrease out of seat behaviors in a clinical setting with the use of a pre-service practitioner. An ABAB design was implemented to establish experimental control. During baseline, no consequences were provided for either in or out of seat behavior. The intervention consisted of the participants self-recording their individual behaviors at the onset of an auditory timer. The participants received a small edible reinforcement if they achieved the predetermined in seat goal. The results showed the intervention decreased out of seat behaviors for both participants as their baseline and intervention data were compared. Future research should seek to generalize such behaviors in a variety of settings.

Tori Waters, University Scholar

Bill Neilson, mentor

Process Improvement in the Operating Room: A Proposal to Make Surgery Safer

The core goals of this thesis are to demonstrate the need for surgical safety checklists, to address the efficacy of surgical safety checklists, and to propose an innovative format to improve that efficacy. Divided into four chapters, this work will: first, attempt to posit a definition for, as well as the implications of, medical error, second, explain how surgical safety checklists are presumed to reduce the occurrence of such errors, third, attempt to investigate why the supposed benefits of checklists are not universally actualized, and finally, to propose an alternative to the typical delivery format of the safety checklist that addresses the problems outlined in the third chapter. This alternative is a computer program that is intended to address the issues associated with gaming the system, accuracy, completion, and attentiveness.

Zach Watters, University Scholar

David L. Jeffrey, mentor

Participating Phenomena, Participating the Spirit: A Theological Reading of Owen Barfield's Theory of the Evolution of Human Consciousness

In this thesis I attempt a theological reading of the ramifications of Owen Barfield's theory of the evolution of human consciousness as articulated most fully in his book, *Saving the Appearances*. Barfield hints at a connection between the sacramental liturgy and the evolution of consciousness but does not go on to develop it. I argue that Barfield's hope for the culmination of the evolution of human consciousness is correlative to the Christian eschatological hope in the deification of man. Furthermore, the Christian sacramental liturgy is the vehicle by which man is drawn into this stage of human consciousness, because it bears in it the seeds of the Kingdom of God. I attempt this reading with the aid of St. Augustine, whose faith in the Incarnation of the Word enabled him to develop a semiotic understanding of the sacramental liturgy.

Rachel L. Wells, University Scholar

Gaynor Yancey, mentor

Quantitative Goals for Prosperity in Waco

Using effective quantitative metrics to represent qualitative goals is essential for accurately measuring holistic community improvement, tracking progress, and determining focus areas. Using Prosper Waco's proposed goals to measure improvements in education, health, and financial security as a starting point, I determined the specific tools, metrics, and exact numbers to effectively quantify Waco's community improvement. In education, this included researching the options for tools to measure readiness to learn in children entering kindergarten, analyzing 3rd grade reading levels, and establishing the best metrics for career readiness. I also conducted statistical analysis on data involving health insurance, food insecurity, community wellness, and teen pregnancy, and used the results to determine the best statistics for measuring the effectiveness of attempts to improve the health of Waco. Finally, determining metrics for financial security involved analyzing data on poverty, employment, and post-graduation achievement. This report outlines the quantitative goals that Prosper Waco should use to measure improvement and the research that drew me to the conclusions I found.

Kyndall White, Mathematics and Medical Humanities

Jeff Levin, mentor

Are Lyme Disease Controversies Harming Patients? A Social History of the Roles of Research, Education, and Treatment in the Patient Experience

Lyme disease is a tick-borne infectious illness causing symptoms that can range in severity from mild to debilitating. It is important for a diagnosis to be made quickly after infection in order to prevent the development of more severe symptoms. However, challenges related to healthcare issues can delay diagnosis. In this thesis, three such challenges are identified: (1) testing and the need for improved diagnostic procedures, (2) a culture of bias and the need for more education, and (3) chronic symptoms and the need for more treatment. These issues are further explored from what are termed the personal, relational, and population perspectives in order to demonstrate their effects on the patient experience. To contextualize these effects, direct quotations from interviews with Lyme disease patients and a caregiver are incorporated. Future changes are proposed with respect to research, education, and treatment in order to encourage action that will improve patient experience.

Linda Wilkins, Journalism and Religion

Jeff Levin, mentor

Research on Prayer and Healing: Past, Present and Future Challenges

As research grows on prayer's effect on healing, conflicts continue to arise about these studies' legitimacy and necessity. Advocates for increased research on this topic claim that prayer is like a medicine that physicians could one day prescribe. Past research studies have indeed suggested that prayer works as a healing mechanism. Those who doubt these studies claim that these projects are not legitimate, in part because they cannot be replicated. Religious persons, too, often shy away from advocating for studying prayer in a scientific setting, because it seems like this is "testing" God's power. This research has implications for the future of healthcare and how patients are treated medicinally. This project is an effort to document these conflicts, as well as to provide a history of research on prayer and healing supplemented by interviews with leading scholars who offer their opinions on this field. While stigmas surrounding this research remain, as do skeptics who disagree with its progression, these studies are gaining ground in the scientific community as a valid topic of investigation.

Madison Young, Baylor Business Fellows and Economics

Andrew Hogue, mentor

Philanthropy and the Public Good for Waco, Texas

In attempts to help alleviate the conditions of poverty and create stronger communities, Americans, motivated to do good, often provide quick fixes to help the impoverished, rather than focusing on root causes and long-term impact. Those well-off readily give food, spare change, and an occasional hour of community service, but neglect to invest deeply into the root of the problem. Though meeting immediate needs is vital to a certain extent, more thoughtful and sustainable approaches can produce better results. In the city of Waco, 35.3% of the population above 18 years of age lives below the state poverty level, which is the second highest poverty rate in Texas. Philanthropic action is one potential means to alleviate conditions of poverty, but permanent change relies on collaboration and purposeful direction. Over the past year, I had the opportunity to participate in Baylor's Philanthropy and the Public Good program. In a group composed of thirty students, I functioned as part of a foundation board and research team, and served as a grant writer, working with seventy-five local nonprofits in the city of Waco. While learning about strategic giving, we put our knowledge to action and donated eight grants, totaling \$100,000, to area nonprofits. Through the program, I had the opportunity to study sustainable giving and

best practices for nonprofits. As a result of my research, I found that strategic philanthropy is correlated with decreasing symptoms of poverty. This thesis will dictate the process of strategic giving, the significance of philanthropy for a healthy society, and how nonprofit should utilize their role to improve life in Waco, Texas.

Ada Zhang, Professional Writing

Sarah Walden, mentor

Feeding the American Narrative

This paper looks at the social, cultural, economic, and political factors in 1950s America that made women embrace the home and the kitchen with arms wide open, but aside from only examining the historical landscape of this particular decade, this paper also looks at rhetoric to analyze the ways in which the American narrative in 1950s domestic literature helped shape the female identity. I argue that the strategy of 1950s domestic literature was to wield the power of the American narrative—weaving its various elements into cookbook introductions, cake mix boxes, canned food labels, televised commercials—in order to subordinate women to the home. Through domestic literature, the kitchen was re-envisioned as not a place of confinement where cooking was mandatory, but rather as a place of freedom where cooking was both a privilege and an opportunity. The kitchen became, in the woman's psyche, a place where the American narrative was realized, and as long as she stayed within the domestic sphere, she was able to experience such things as life, liberty, and the pursuit of happiness.