

**ABSTRACTS OF
THESIS PROJECTS**

SPRING 2016



BAYLOR
UNIVERSITY

BAYLOR HONORS COLLEGE

The Honors Program

University Scholars

HONORS THESIS ABSTRACTS

2016 GRADUATES

Lindsay Adams, University Scholar

Lisa Baker, mentor

Against All Odds: A Comparative Study of Student Success in Four Schools in Rural Western Kenya

In a Kenyan student's life, poverty often brings with it malnutrition, disease, death of parents, and poor education. This study compared four primary schools in rural Kenya, one scoring an average of 492 out of 500 on the important Form 6 national examination. Administrators, teachers, parents, and the students who took the test were interviewed from the two highest- and the two lowest-achieving schools in the district. Participants were blinded to the outcome of interest. Predictor variables included school facilities and supplies, provision of a mid-day meal, student variables, and teacher variables. Findings showed that the school with the poorest facilities scored the highest. However, this school was the only one where students were provided with a mid-day meal. Highest test scores also were associated with the lowest class size and the highest attendance by both students and teachers. Successful students had teachers who spent at least twice as much time with their students one-on-one outside of the classroom. Living with two adults (ironically more common in the school for orphans), being happier, and being more future-oriented in their understanding of the purpose of school were also characteristics most common among the highest-achieving students. These findings indicate a sustained commitment of the community to help these children succeed against all odds. A school with scrap-metal buildings and dirt floors led their students to overcome the many challenges they face through providing nourishment and highly invested teachers, instilling hope within a caring environment.

Hijab Ahmed, Chemistry

Mary Lynn Trawick, mentor

Small Molecule Inhibitors of Cruzain for Treatment of Chagas' Disease

Chagas' disease, a neglected tropical disease, affects millions worldwide. This zoonosis occurs as a result of parasitic invasion. The etiological organism, *Trypanosoma cruzi* (*T. cruzi*) enters mammalian host cells in the feces of triatomine bugs through a break in the host external membrane. There are two phases of the disease with different presented symptoms. Current treatment proves largely ineffective in the chronic phase and highly toxic, however no other treatment exists. Due to the drug's negative side effects, there is an urgent unmet need for alternative treatments. A potential therapy lies in targeting cruzain, the recombinant form of cruzipain, because this cysteine protease is involved in nutrition, cellular remodeling, immune evasion, and parasitic replication

throughout the life cycle of *T. cruzi*. Treatment of an infected mouse with the cruzain inhibitor K777 resulted in the eradication of the *T. cruzi* infection. This confirms cruzain as a potential target for developing a curative treatment. A series of thiosemicarbazone derivatives synthesized by the Pinney laboratories as part of a collaborative project between the Trawick and Pinney laboratories at Baylor University were evaluated as inhibitors of cruzain. A plasmid for cruzain production by recombinant DNA was provided by the James McKerrow laboratory at UCSF. This study intended to validate these compounds as potential inhibitors of cruzain by ascertaining IC_{50} values against the enzyme. Moreover, advanced kinetic investigations of the most effective inhibitors were conducted so their mechanisms could be understood. Cruzain activity was monitored using a fluorogenic enzyme assay, which measured the concentration of 7-amino-4-methylcoumarin (AMC) product released from Z-FR-AMC, a synthetic substrate. A number of thiosemicarbazone compounds proved to be effective inhibitors of cruzain in the nanomolar range (29.5-312 nM). Progress curves and pre-incubation studies show these compounds as time-dependent inhibitors. Analysis of these data with the Morrison equation provides support for these compounds as covalent inhibitors.

Lauren Ammerman, University Scholar

Jennifer Good, mentor

Resurrecting Tyrannosaurus Rex

Would you like a *Tyrannosaurus rex* as a pet? That may seem like a ridiculous question. However, after the first successful extraction of ancient DNA from a fossilized Quagga in 1984, the subsequent development of PCR (Polymerase Chain Reaction) technology opened up a new world of scientific possibility. Armed with fragmentary ancient genomes, it seemed as if the days of resurrecting dinosaurs and mammoths were only a few technical difficulties away. Although a more outrageous theory involved creating tactical dinosaurs to bolster the United States military, an arguably less ridiculous proposal surfaced in the form of Michael Crichton's *Jurassic Park*, published in 1990. Coupled with Steven Spielberg's 1993 feature film of the same name, these works ignited scientific and popular debate over the ethics, feasibility, and entertainment value of a "Jurassic Park" experiment. This thesis incorporates a survey of current dinosaur genetic data, recent re-wilding efforts, and modern technological capabilities to discuss whether or not scientists should ever attempt to re-create a dinosaur in the future. Using the specific example of *T. rex*, this thesis asks, is there a way to make bringing back a dinosaur into a productive experiment, other than undertaking it just because we can?

Billy Anderson, Electrical and Computer Engineering

William Mack Grady, mentor

Tracking the Point of Maximum Power Production in Photovoltaic Panels Using an Atmel ATmega128 Automatic Arduino Control System

Manually tracking the weather-dependent point of maximum power production in a photovoltaic panel can become cumbersome for researchers, requiring them to sweep through the panel's PV curve several times a day in order to obtain adequate data on panel performance. In this experiment, an automatic closed-loop control system featuring the Atmel ATmega128p microprocessor mounted on an Arduino Uno will be designed to automate the data acquisition process. Other essential system components include two power electronics circuits: a diode bridge rectifier and a buck-boost converter. These two circuits will be used to down-convert the unregulated, time-varying voltage supplied by the solar panel to a regulated voltage safe for use as a feedback signal to the Arduino. Using this signal as a reference, the Arduino will then be able to track the point of maximum power production throughout any given day without user intervention and provide plots ready for analysis.

Wesley Beck, University Scholar

Ken Jones, mentor

Catiline the Mad: An Excursion into the Ancient Sources

One of the most fascinating and bewildering incidents in history is the Catilinarian Conspiracy, an attempted overthrow of the Roman republic by Lucius Sergius Catilina which was foiled by the decisive action of the consul Marcus Tullius Cicero. There is an generous supply of ancient writings concerning the career of this man, most notably those of Cicero and Sallust. Despite the varied sources, there is a surprising amount of contradictory evidence concerning the character and the motivation of Catiline, even within works by the same author. In this thesis, I closely examine and compare the most prominent ancient sources on Catiline with a view toward bias and motivation, and piece together the most plausible depiction of the events of 63 BC.

Catherine Booth, International Studies

Ivy Hamerly, mentor

Bureaucratic Authoritarian Regimes and Their Model of Democracy

Do bureaucratic authoritarian regimes democratize in a specific way and why does this matter? This thesis looks at bureaucratic authoritarian regimes and their characteristics as well as their pathway to democracy. Bureaucratic authoritarian regimes are a specific type of authoritarian regime characterized by having a government made up of highly bureaucratized officials and focusing on industrializing the economy. Bureaucratic authoritarian regimes democratize by the population inciting rebellion against the leader and, subsequently, the regime making democratic concessions. Eventually, the democratic concessions made by the leader causes the regime to lose power and ultimately democratize. This process occurred in numerous countries in Latin America, including Brazil, Argentina, and Chile, as well as East Asia, including South Korea, Indonesia, and the Philippines. This model is important because it can theorize how current bureaucratic authoritarian regimes, such as Russia, will eventually democratize.

Kaley Branstetter, University Scholar

Junius Johnson, mentor

When He Comes In Glory: Theatre and its Resources for Theology

In my senior thesis project, I examine the resources that theatre offers for understanding theological concepts. Early church fathers like Tertullian and Augustine argued that Christians should have no association with drama. Tertullian viewed the theatre as a temple of idolatry, while Augustine believed that the theatre provokes passions that have no part in a faithful Christian's walk. In my thesis, I address Tertullian's and Augustine's criticisms of theatre, and then suggest that both authors actually provide hints that there is something of Christian value to be redeemed from the realm of theatre. I will draw on Hans Urs von Balthasar and his work *Theo-Drama* as an example of theology that relies on theatrical concepts and terminology to make sense of the drama of the incarnation. For the last chapter of my thesis, I will explore possible ways to use the realm of stage to understand God's active role in the salvation of mankind and examine how the way an actor inhabits a role might hold useful analogies for understanding how Christ became man and how a Christian becomes more like Christ in everyday life.

Shelby Brantley, Chemistry

Darrin Bellert, mentor

Computational Study of Nickel Cation Clusters, Ni_n⁺ (n = 1-4), and Their Binding Energies to Acetone

Metal cluster systems are of extreme interest due to their potential use as catalysts. Computational studies of nickel cation clusters have been conducted to determine the fundamental binding properties and structures of these clusters. Density functional theory has been employed to optimize the Ni_n⁺ structures and evaluate the binding energy of the Ni_n⁺ structure bound to acetone. The functional/basis set combination of PBEPBE/aug-PVTZ was utilized in calculations and the binding energies of acetone to the cluster were determined to be 21802, 16851, 10437, and 13598 cm⁻¹ for the nickel cation cluster n = 1 - 4 respectively. Trends in ligand binding correlate with Mulliken charge densities calculated within each cluster. This computational analysis provides motivation for planned experimental studies of the reactivity of nickel clusters toward a single bound ligand.

Caitlyn Brashears, University Scholar

Patrick Danley, mentor

Post-Zygotic Isolation and Haldane's Rule in Two Closely Related Lake Malawi Cichlid Species

Cichlid fishes from the Great Lakes in East Africa experienced an extensive, rapid, and recent diversification resulting in over 2,000 species of fish over the course of 10 million years. Such extraordinary diversification is thought to have been driven by behavioral pre-zygotic isolation. However, limited research has been conducted evaluating the role of post-zygotic isolation in promoting the reproductive isolation of African Cichlid fishes. In order to test the hypothesis that post-zygotic isolation contributes to the reproductive isolation of two closely related Lake Malawi African Cichlid fishes, *Maylandia benetos* and *Maylandia zebra*, I artificially created conspecific and reciprocal hybrid crosses and examined the fitness of the first generation. Fertilization rate, hatching rate, survival rate, and sex ratios were analyzed and compared. I found no differences in fertilization rate, hatching rate, or survival rate. However, the interspecific cross with a *M. benetos* female produced no male offspring. The absence of males in the interspecific cross with a *M. benetos* female may provide support for the hypothesis that post-zygotic isolation contributes to the reproductive isolation of *M. benetos* and *M. zebra*.

Sarah G. Brister, Medical Humanities

William G. Hoy, mentor

The Best and Worst of Times: Charles Dickens, the Victorians, and American Public Health

Charles Dickens is one of the foremost authors of England's Victorian era, and his works continued to be studied and enjoyed today. Through heart-wrenching depictions of oppression and injustice, Dickens conveyed his deep concern for social reform throughout his works. Three of the areas he desired to see changed were the governmental intervention in its population's health, the hardships physicians experienced in their practices, and the environmental hazards that plagued the growing population of this recently industrialized nation. This thesis recounts examples from Dickens' novels that describe these issues and explores the true magnitude of these problems in Victorian England. It then compares these struggles to problems the American public is facing today to show how similar Dickens' time is to the United States today. Ultimately, because these issues in American public health correspond to those of Victorian England, Charles Dickens' novels can offer medical professionals valuable lessons in dealing with these problems.

Cara Campos, English

Alexander Engebretson, mentor

"The Flag of Permanent Defeat": Failure, Success, and the Masculine Ideal in the Works of Ernest Hemingway

Hemingway has often been considered an overly masculine writer; as a public figure who was known for participating in typically “manly” activities, many people think that his writing reflects this hyper-masculine image. Some have suggested that Hemingway believes in a “code” of manliness that all people must follow in order to be worthy of respect. However, rather than all of his characters embodying this idea with overly macho behaviors and beliefs, many of them have very clear battles with their own sense of gender. The idea of there being a “masculine ideal,” or a goal of masculinity that all people should work toward and achieve, therefore, is called into question through Hemingway’s portrayal of his characters. His illustration of them, in fact, suggests that any kind of masculine ideal in existence is utterly impossible to reach, and so anybody who attempts to achieve it will inevitably fail. In this paper, I look at three categories of characters in Hemingway’s fiction: the hunters, the wounded, and the transgender. Through analysis of these characters, I look at whether the masculine ideal is indeed impossible to reach, whether the characters who do not reach it can still be worthy of respect, and, if so, what they need to do, in spite of the masculine ideal being unachievable, in order to deserve that respect.

Rachel Cantrell, Great Texts

Junius Johnson, mentor

Awoken: Reflections on The Beginning of Creation according to John Paul the Great's Theology of the Body

The Garden of Eden continues to inspire us, thousands and thousands of years later. How fascinating is the beginning, God’s original intention, mankind’s original role, and the perfect relationship the Creator and His creation shared! I argue that the first three chapters of Genesis form a crucial guide to understanding humanity. This project focuses on the original situation and its implications for modern man. It is a scriptural reflection on the beginning of creation, focusing on the good before the terrible. I will spend the majority of the time on creation pre-fall, first proving that understanding creation is crucial to understanding the conditions for a fulfilled human life, then exploring mankind’s original role in the garden and the relationship between man and woman. Constructive conclusions will also be drawn throughout, showing how to use the beauty of Eden to draw others closer to the One who created it. This thesis will be a theological reflection firmly rooted in Catholic tradition, drawing mainly from St. John Paul the Great’s collection of speeches known as *Theology of the Body*.

Nathaniel Chaverin, Physics

Jay Dittmann, mentor

Performance of the Prototype Readout System for the CMS Endcap Hadron Calorimeter Upgrade

The Compact Muon Solenoid (CMS) experiment at the CERN Large Hadron Collider (LHC) will upgrade the photodetectors and readout systems of the endcap hadron calorimeter during the technical stop scheduled for late 2016 and early 2017. A major milestone for this project was a highly successful testbeam run at CERN in August 2015. The testbeam run served as a full integration test of the electronics, allowing a study of the response of the preproduction electronics to the true detector light profile, as well as a test of the light yield of various new plastic scintillator materials. We present implications for the performance of the hadron calorimeter front-end electronics based on testbeam data, and we report on the production status of various components of the system in preparation for the upgrade.

Lindsey Coker, University Scholar

Arna Hemenway, mentor

Art and Text: An Exploration of the Graphic Novel

The graphic novel is one of the most exciting forms of storytelling in use today. Its combination of art and text offers endless possibilities for creative expression and can produce incredibly complex and rich narratives. The goal of this thesis is to demonstrate why certain stories are best told as a graphic novel rather than through traditional prose or some other medium. In doing so, this thesis will briefly explore the history of the graphic novel and its emergence as a distinct form, discuss unique features of this medium and their use in crafting a narrative, and examine specific texts that utilize these features to create meaning and develop a story that could only be told in this way.

Jade Connor, Biology

Bill Neilson, mentor

Body Worlds: Spectacularism and its Role in Democratizing Anatomy

Since 1993, Gunther von Hagens' traveling body exhibition Body Worlds has been visited by over 40 million people worldwide. The plastinated displays marketed as "real human bodies" have elicited both praise for their artistry and condemnation for their alleged disregard of human dignity from a variety of fields. Through an analysis of Body Worlds that incorporates normative ethical considerations from the disciplines of anatomy, museology, medical education, and art, this thesis seeks to determine whether the methods used by Body Worlds to create and market its exhibitions spread appreciation and knowledge of anatomy at the expense of human dignity. After providing a historical foundation for the rise of displayed anatomy and the social acceptance of body donation, the topics of body commodification, informed consent, museum practices, public education, and artistic influences in anatomy will be discussed. Finally, changes to Body Worlds will be proposed to shift the focus of the exhibitions from the perpetuation of a spectacularized image of death back to the dissemination of anatomical education to the public.

Danielle Cooper, University Scholar

C. Alfred Mackenzie, mentor

Why Aren't Women Running? Addressing the Underrepresentation of Female American Politicians through the Leadership Valuation Gap

The main aim of this paper is to examine the underrepresentation of women in United States elected office and then to propose a psychological explanation for this phenomenon. To do so, I discuss potential disadvantages women face in running for office. Then, I analyze recent gender trends within American government. From there, I evaluate different factors that may influence a woman's desire to run for office. I qualify two existing explanations for women's underrepresentation, the political ambition gap theory and leadership ambition gap theory, by proposing the concept of a "leadership valuation gap." After establishing this notion, I investigate its effects on the current American political system. Finally, I discuss public policy initiatives that could address the leadership valuation gap, providing real-world accounts from female American politicians and data from a survey that I conducted.

Mallory L. Cormack, University Scholar

Kenneth R. Jones, mentor

Creatures of the Triumvirs: A Prosopographical Study of the Patron-Client Relationship in the Late Roman Republic

Dr. Erich S. Gruen's article "P. Clodius: Instrument or Independent Agent?" addressed for the first time the problems inherent to viewing the clients of the Late Roman Republic as merely the puppets of their patrons. This study proposed to examine several major clients—Gabinus, Clodius, and Milo—to determine to what degree they operated under the guidance of their patrons and to what extent they exercised political independence. To do this, the careers of the clients and the primary sources were examined in detail to analyze the influence of the patrons in their respective political actions. In the process of the study, questions were raised about the changes the relationship underwent in the Late Roman Republic and the political role that the patron-client relationship still played. This study found that the clients operated with more freedom than was previously believed and had to contend with a political atmosphere in which alliances were made and sacrificed with equal rapidity.

Victoria Cox, University Scholar

Alden Smith, mentor

Delegates of Love: A Historical Narrative of Mission Waco and Portraits of Humanity

Cicero deems friendship the greatest gift afforded to man; Jewish philosopher Martin Buber claims relationships are fundamental to the essence of living; Jesus presents the Golden Rule, to love our neighbors as we love ourselves, as the greatest commandment. Each of these shares the common characteristic of transformative ministry, a characteristic fundamental to the work of Mission Waco. Through in-depth interviews with Mission Waco leadership, workers, and participants, I seek to uncover the purpose, motives, and legacy of Mission Waco. This thesis then analyzes and presents these findings through an array of different angles, including an in-depth exposé of Mission Waco and a series of profiles of program participants. I conclude that as an avenue of Christian love, Mission Waco may be distinguished not only for its practical and effective approach to fighting poverty and social injustices, but also for its commitment to transformative Christian relation.

David Crawford, University Scholar

William G. Hoy, mentor

Investigating the Influence of African American Clergy in Congregants' Medical Decision-Making at the End of Life

Scientific literature has demonstrated correlations between spirituality and health outcomes at the end of life, both in regards to emotional well-being and treatment options pursued. However, the impact of pastoral visits has yet to be studied as it pertains to congregants' medical decision-making at the end of life. This thesis utilizes a Grounded Theory approach to study clerical influence through literature review and semi-structured interviews with pastors in McLennan County, Texas. Analysis revealed that pastors can play a significant role in guiding their congregants' medical decision-making, especially when their counsel is sought during a health crisis. Emergent themes from this study indicate that pastors may impact the health care model by influencing the doctor-patient relationship, improving emotional health through prayer, and providing encouragement for palliative care options such as hospice.

Parker Dalglish, University Scholar

Bill Neilson, mentor

Cost-effectiveness in the U.S Healthcare System

The United States, while home to some of the best medical procedures and doctors in the world, is currently in a healthcare crisis. The entire system is not cost-effective at both the macro level of government spending and the micro level of clinical analysis. Even with the passing of the Affordable Care Act and a focus on containing costs, the United States spends more than twice the amount of money per capita compared to the second highest spending nation in the world. This thesis analyzes certain aspects of the U.S Healthcare system in order to identify specific areas that could be improved at all levels. This includes inefficiencies in government spending, clinical decision making, and common procedures such as mammography and prostate specific antigen (PSA) testing. Certain guidelines and recommendations can be extrapolated from these analyses in order to provide recommendations and guidelines in an effort to increase cost-effectiveness and address specific areas in our current crisis.

Faith Danielson, Professional Writing

Lynne Hinojosa, mentor

Remember and Retell: The Transformation of Place and Identity through Memory in Marilynne Robinson's Gilead, Home, and Lila

This thesis explores the lives of the characters John Ames, Jack Boughton, Glory Boughton, and Lila Ames in the novels *Gilead*, *Home*, and *Lila* in relation to studies on memory, place, identity, and the sacred. In all three of the Gilead-centered novels by Marilynne Robinson, the places of Gilead or the Boughton home are pivotal in inspiring memories that incite transformation in the characters' perceptions of their memories and their identities in the context of the narrative place of Gilead. Rightly understood, the actions of Robinson's characters create a framework for readers on how to process their relation to the places they inhabit by both admitting the faults of the place and giving due gratitude for its successes and potential for growth.

Constance Davis, Electrical and Computer Engineering

Scott Koziol, mentor

Brain-Inspired Robot Localization

Connecting ideas found in electrical engineering and neuroscience, this research describes a brain-inspired navigation system that would facilitate in robot path planning. Robot path planning has already been implemented in other ways. However, this research will describe a biology-inspired method for robot path planning that imitates the processes of the brain's internal positioning system. The brain performs high level computations at low power. If the same processes implemented in the brain could be replicated on electronic circuits, then these circuits could possibly perform higher level computations at low power as well. This report presents a neuron circuit that behaves much like a neuron in the brain. This report also presents a Matlab simulation that induces firing patterns in neuron circuits in a way similar to that of the brain.

Teresa Q. Dean, Professional Sales

Lenore Wright, mentor

Double Bind: Women of Color In Business Leadership

This paper argues that women of color are underrepresented in business leadership, because of the unique and shifting standards by which they are evaluated. I seek to explain the relative lack of minority women in business leadership by examining various forms and theories of gender bias, then how such bias affects women of color who share several minority-related identity markers – race/ethnicity, immigration status, class or family of origin and language. After examining various theories of gender bias, I turn to possible strategies for disrupting and combating bias. These strategies include individual steps for supporting the promotion of minority women into leadership positions, as well as broader, structural changes that might reduce workplace barriers that women of color face.

Megan Demel, Biology

Lori Baker, mentor

Dental Caries and Restorations in Undocumented Border-Crossers

Dental caries are among one of the most common diseases found in humans and the prevalence and frequency of the occurrence of these lesions often depends on the health and diet of the local population. An individual's socioeconomic status can indicate what type of dental restoration is used or if the lesion is ever treated. The purpose of this study is to observe the carious lesions and dental restorations of unidentified undocumented border crossers that have died during migration across the Texas-Mexico border region, specifically those whose remains were recovered in Brooks, Starr, Val Verde, and Jim Hogg counties by the Reuniting Families Project at Baylor University. Caries were described by tooth number, location, and number of lesions on a tooth. Restorations were described by tooth number, location, number per tooth, and material used.

Allie Drain, University Scholar

Mark Olsen, mentor

A Conflict of Interests

This collection of fictional short stories relates the experiences of three different soldiers serving in the Afghanistan War. Each story takes a glimpse not only into their time in Afghanistan, but also into the situations and motivations which brought them into the military in the first place. This collection aims to explore how a wide variety of motivations can appear even in similar circumstances, and how different family backgrounds, experiences, and personal values continuously influences an individual's perspective on important events.

Colleen Drapcho, Mathematics

William Neilson, mentor

The Effects of Electronic Medical Records on Patient-Physician Relationships and Interactions

In 2009, the federal government passed the American Recovery and Reinvestment Act as a stimulus bill. This bill included the Health Information Technology for Economic and Clinical Health (HITECH) Act, which provided spending to create a national system of electronic medical records (EMRs). The goal of implementing EMRs

nationwide was to improve the quality of medical documentation, decrease patient safety hazards and healthcare costs, and improve communication between healthcare providers. The switch to EMRs from paper records has been accompanied by the incorporation of computers into examination rooms in order to document required patient information. The survey conducted for this thesis found that physicians believe that relationships with patients with paper records were of better quality than with current electronic records. Over half of the physicians who responded to the survey said that with the concurrent use of computers in clinical visits for EMRs, there is less face to face interaction and significantly reduced eye contact with patients. Physicians overall did not favor EMRs and said that computers interfere with patient-physician interaction. One way to avoid this interference is for physicians to share the computer screen with patients, allowing for patient collaboration. The best long term solution to decrease the impact of computers in patient-physician interaction is to begin formal training in proper EMR use during clinical visits and in verbal and non-verbal communication skills at the start of medical education. With training, physicians will be better equipped to maintain meaningful relationships with patients by learning to use EMRs for the benefit of the patient.

Kelsey Duarte, Biology

Positive Effects of Hippotherapy on Children with Dravet Syndrome

Hippotherapy has been used since the time of Hippocrates as a therapeutic treatment. Though not experimentally researched in Dravet Syndrome, there is reason to believe that hippotherapy would be beneficial to both the physical and emotional needs of these children. Severe Myoclonic Epilepsy of Infancy, or more commonly known as Dravet Syndrome, is a rare seizure disorder that affects roughly one in every thirty thousand children before the age of seven. It is an epileptic encephalopathy that is caused by a mutation in the SCNA1 gene. This mutation is the basis for the numerous, often uncontrollable seizures that these children face. As a side effect of these seizures, most children experience motor impairments, most notably ataxia. There are many drug and non-pharmacological treatments that have been shown effective to help reduce the number and severity of the seizures, but most are very expensive and still experimental. Based off of proven results in children with similar disorders such as MS that cause ataxia, it is concluded that hippotherapy would be effective but needs further experimental study. Not only would hippotherapy be cheaper than many alternatives, but it also would be effective in other areas such as quality of life, social skills, coordination, and balance.

Andrew Eberlein, Great Texts

Junius Johnson, mentor

The Aristotelian Development of Trinitarian Metaphysics through the Thought of Boethius and Aquinas

God was declared Trinitarian at the Council of Nicaea in 325 AD. The divine nature is shared amongst all three persons, who are coeternal. This belief was made dogma and thus is held as the universal belief of the Church. This decision instigated a further theological pursuit to clarify this definition of God as Trinity. Boethius engaged in this endeavor in his *De Trinitate*. First, he determines his own interpretation of Aristotelian metaphysics, next how to express God metaphysically as a substance, and then how to define each person metaphysically as a relation. In his *Summa Theologica*, Aquinas continues and invokes Boethius work. He further classifies God, according to his processions and relations, and then he discusses how to assert personhood of God and the plurality of persons in the divine nature. He finishes by detailing what are appropriate terms for referring to plurality of persons and unity in God. This Thesis pursues their primary thrust into defining the Trinitarian nature of God.

Nathan Elequin, Baylor Business Fellows

Jason Whitlark, mentor

Press A+ To Play: The Emerging Field of Gamification in Higher Education

Higher education faces a critical issue with producing and encouraging engagement in and out of the classroom, as students are finding more reasons to dismiss their coursework as a "means to an end" in the game of the degree-grab. Meanwhile, research from the unorthodox and previously-untapped field of game design offers to provide a unique solution to these educational concerns. In short, the newly-emerging field of gamification asks a simple question - how can we make the learning experience more meaningful and fun for the average student? In this expansion on the works of TEDx spokesperson Yu-Kai Chou and New York Times bestseller Jane McGonigal, I argue that game designers possess an invaluable expertise in holding the attention of and creating meaningful experiences for emerging adults. I then dissect the higher educational discipline from the perspective of a game engineer, to discuss and diagnose the critical failings of the institution in exciting and engaging its students. Finally, using Chou's pioneering Octalysis Framework, I will detail eight strategies for improving learning through a game design approach, concluding with a listed arsenal of engagement tools that be directly-applied to the programming and pedagogy of the classroom. By the end of this thesis, parents, student, educators, and administrators alike will have acquired actionable tools to increasing the enjoyment and engagement of their educational experiences.

Aya Farhat, University Scholar

Sarah Walden, mentor

A Retrospective Call For Action: Mad Men's Feminist Reawakening

When *Mad Men* first aired in the summer of 2007, it was more than just a television series with the uncanny ability to tap into the subconscious minds of its viewers, causing them to reminisce about a bygone era they may or may not have actually experienced. It was a show that highlighted the range of experiences present in a decade most people now only look back on with nostalgia. The series, which follows an advertising agency amidst its ups and downs, trades and merges, would not have held its allure over seven seasons without the presence of its multifaceted characters, namely that of its female leads. While arguably every single character in *Mad Men* plays an essential role in the developing narrative, modern viewers may take special interest in the characters Elizabeth "Betty" Hofstadt, Joan Harris, and Margaret "Peggy" Olson for their potential to not only extend beyond their visual personas seemingly locked in time but for their unique capability to connect viewers across generational and ideological divides. Moreover, these characters exhibit a special ability to bridge this dichotomy by encouraging a return to critical perspectives regarding the limited roles afforded to women in media and the restrictive expectations placed upon their femininity. On its surface, *Mad Men* is not a show advocating for feminism; in reality, its historical rendition appears to be promoting the precise opposite. At its core, however, *Mad Men* is a series that clearly calls for the revival of a movement through a restoration of its disparate parts. In this way, the contrastive attributes of Betty, Joan, and Peggy function to embody a displacement that can only be understood as a feminist reawakening.

Nicole Feragen, Economics

Jason Aimone, mentor

Re-defining Rationality: An Analysis of Criminal Behavior

At the core of economics is the idea that humans behave rationally and will maximize their own utility in any given situation. Illegal behavior, then, can be hard to explain; a criminal must reason that breaking the law is worth the potential benefit their action could bring. Traditional studies examining the motivations behind crime have been divided, with economic theory on one side and sociological, biological or psychological theory on the other. Only recently have researchers considered variables from both of these categories simultaneously in crime modeling. This thesis treats the combined model of Peter-Jan Engelen, Michel W. Lander, and Marc van Essen in

"What determines crime rates? An empirical test of integrated economic and sociological theories of criminal behavior" as a basis for an exploring what factors determine crime rates, and expands upon it through the addition of five novel predictors. County-level panel data testing from North Carolina finds that previously unconsidered factors, such as the number of practicing psychologists, correlate to violent and property crime in the state. These results are then discussed in a legal context, with deterrence methods as well as the effectiveness of current sentencing and rehabilitation practices in mind.

Jacob Field, Psychology

Alan Jacobs, mentor

Theistic Psychology: A Study in Dostoevsky and Kierkegaard

In the psychological tradition there have been two general types of psychologists, the experimental and the arm-chair. William James, one of the founders of Psychology, was an arm-chair psychologist who mused about how the human mind worked based on what he knew and observed. Many philosophers can be considered part of the psychological tradition in much the same way. Two such philosophers who are often sighted as dealing in depth with psychology are Fyodor Dostoevsky and Soren Kierkegaard. What is unique about them is that they were both Christians, Dostoevsky an Orthodox and Kierkegaard a Lutheran. The major psychological tradition works atheistically based on principles of determinism, mechanism, and positivism. So the question this thesis seeks to answer is, how does Christianity make Dostoevsky and Kierkegaard different, if at all? Through a study of Dostoevsky's *Crime and Punishment*, *Devils*, and *The Brothers Karamazov* and Kierkegaard's *The Sickness Unto Death*, I seek to find how Christianity influences their views on psychology.

Hannah Fifer, Psychology

Jason Whitt, mentor

The Ethics of Using Genetic Technology in Relation to Reproduction

A boom in the understanding of genetics since the mid-twentieth century has manifested itself in the development of various technologies related to the human genome. Among these technological developments are those relating specifically to reproduction. Parents now have the ability to detect chromosomal abnormalities during the course of a pregnancy. They also have the ability to screen for various genetic disorders among embryos before deciding which to implant in the uterus. Currently, research is underway exploring the possibility of altering the germline cells of parents in order to alter the genes of succeeding generations. The use of this technology is often to prevent certain types of people from coming into existence and to promote others. This thesis examines available and emerging genetic reproductive technologies, their relation to eugenics, and some key ethical considerations for the Christian trying to assess the purpose and value of these various technologies.

Makenzie Renee Fitzgerald, University Scholar

Richard Russell, mentor

Troubling Poetics: Risk and Reconciliation in Seamus Heaney's Early Poetry and Prose

Contemporary Irish poet, playwright, translator, and critic Seamus Heaney is widely recognized for his ability to identify and negotiate the demands of ethical responsibility and artistic integrity. In this thesis, I explore the development of Heaney's poetic theory in the decade immediately following the outbreak of the Troubles in

Northern Ireland, with specific attention given to the risks he identifies and mediates within poetry. I will examine these critical issues as they appear in Heaney's first prose collection, *Preoccupations* (1980), and his third and fourth volumes of poetry, *Wintering Out* (1972) and *North* (1975). An examination of *Preoccupations*, emphasizing the collection's structure, serves as a foundation for his poetic theory during this time. The second chapter is then a comparison of two poems, "Whatever You Say Say Nothing" and "Traditions," in light of the tensions Heaney explores within linguistic and national identity. Finally, the third chapter examines the risk to the poetic subject through an explication of one of his most controversial poems, "Punishment." Ultimately, I argue that Heaney's awareness of the risks within poetry is essential to his ability to negotiate these risks with the powerful, reconciliatory potential he identifies – and achieves – in poetry.

Ashlyn Foster, Health Science Studies

Matthea Williams, mentor

A Study of Non-Specific Low Back Pain in a College Population including a Case Study Analysis of Physical Therapy Patient Data

This study will investigate the presence, causes, treatments, and effects of non-specific low back pain in a college population, between the ages of 18 and 24. It includes a literature review of the current research on the subject, as well as an extended case study of the evaluation, treatment, and outcomes of 30 patients treated by a local physical therapist. Non-specific low back pain is low back pain that does not have an anatomical cause; consequently, low back pain that is the result of a fracture, strained muscle, or other physical anomaly is not explored in this study. It is found that there are physical and psychosocial causes and treatments for non-specific low back pain, with little evidence of a standardized treatment plan. It is likely that no such plan exists given the varied nature of this type of pain, but several factors of the reviewed physical therapy treatment plan, including core strengthening and stretching, were seen to be helpful in reducing non-specific low back pain in the population examined.

Virginia M. Gallardo, International Studies

Ivy Hamerly, mentor

Immigration and the United Kingdom: An Analysis and Prediction

Immigration has been and still is a major policy issue in the United Kingdom. A prediction into how the United Kingdom will react to future waves of immigration requires a study into how the United Kingdom reacted to past immigrant waves. The main waves of immigration includes, the Commonwealth immigrants, the Jewish immigrants from Russia and the Eastern Europe immigrants. Along with a look at the different effects of the immigrant waves, a look at the man that, arguably, started everything, is crucial. Enoch Powell was one of the most influential minds in regards to immigrants and his beliefs are still espoused today. It is from these background sources that the prediction can be made that the people of the United Kingdom will only continue to react negatively towards immigrants whether or not the economy is stable or whether these immigrants are fleeing from persecution or violence.

Austin Gillette, Biology

Dwight Russell, mentor

Exoplanet Habitability and an Analysis of Gliese 436 b

Exoplanets are planets that orbit stars other than the Sun. Currently, thousands of exoplanets have been discovered with billions more believed to be in existence in the Milky Way alone. Since the discovery of the first exoplanet in 1995, many scientists have postulated that life may exist on one of these extrasolar objects. Searching for these so called habitable worlds involves primarily looking for exoplanets that are similar to Earth. The most important factor to consider when analyzing habitability is the possibility that liquid water can exist. This is primarily determined by whether or not an exoplanet lies in the host star's habitable zone. If an exoplanet lies in the habitable zone, then the temperature on the exoplanet is likely conducive for liquid water, assuming no other factors that alter temperature exist. Density is another important factor to consider, because exoplanets with a similar density to earth are primary targets for further habitability research. In order to apply these habitability factors, the exoplanet Gliese 436 b was observed using the Paul and Jane Meyer Observatory during a transit of the host star, Gliese 436. A light curve of relative magnitude versus time was plotted from the images taken in order to determine the radius and density of Gliese 436 b. A habitability zone calculation was also performed using information about Gliese 436. Using this information, a determination on the habitability of Gliese 436 b was made.

David A. Guthrie III, English

Kevin Gardner, mentor

The Molding of the British Boarding School Student

English society uses the British boarding school system as a means to mold children into proper adults. The boarding schools encourage virtues and ideas that society demands of adults and it shuns ideas that society dislikes. This system creates two types of students: those who successfully are reformed by the schools, and those who are unable to become what society demands of them. It is not that these students are not smart or do not show potential, but their inner identity does not comply with the outer identity that society wishes they would embody. By looking at a variety of British literature, both fiction and nonfiction, one can see how different characters are effected by the boarding school system. By comparing these characters, it becomes clear the various positive and negatives aspects of the boarding school system, but even beyond that, it displays the positives and negatives of English society.

Oliver Ha, University Scholar

Barry Harvey, mentor

Constructing a Catholic Political Economy: The Catholic Anthropology and Market Capitalism

In this thesis, I will argue that the vision of the human person implicit within market capitalism differs from the anthropology outlined and interpreted through Catholic Social Teaching; the anthropology of each posits different ends and purposes for human flourishing. This is a debate between two schools of thought within Catholicism. On the one hand are the compatibilists (my own neologism). Compatibilists maintain that capitalism and the liberal democratic environment in which it flourishes are at bottom morally neutral, allowing individual Christians to freely pursue their religious ideals. On the other hand are those whom I term incompatibilists. They argue that the free market inculcates values inimical to Christian beliefs insofar as it promotes economic liberty as an end in itself while neglecting humanity's highest and true ends. For them, the contractual, profit-seeking conception of human life (captured by the term *homo economicus*) is not morally neutral and has a solvent effect on morality and

religion. Lastly, I will argue how the Church, given the fact that global markets will endure and grow, can create an alternative political economy with distinct practices in order to act as a signpost in the desert.

Meghan Haffey, University Scholar

Renée Umstadd-Meyer, mentor

The Benefits of Physical Activity Interventions on Pediatric Asthma Patients: A Systematic Review

As an asthma patient since age 3, I have witnessed the effectiveness and importance of physical activity as an aid in asthma management and control. However, despite the extensive research supporting the physiological, social and psychological benefits of an active lifestyle for asthmatic children, very few physical activity interventions that focus on improved changes in long-term exercise behavior have been implemented. Therefore, this thesis conducted a systematic literature review to completely understand the many benefits associated with implementing physical activity interventions for asthmatic children. Additionally, after completion of a detailed analysis of published physical activity interventions, a correlate research literature search was also done for further analysis of the importance of physical activity interventions for asthmatic children. Results suggested that asthmatic children benefitted a great deal from exercise participation and leading an active lifestyle, especially when a proper physical activity intervention was constructed and implemented. It is important for researchers to learn from previously implemented interventions so as to create better means for asthmatic children to benefit from physical activity interventions conducted in the future.

Christina Hagan, Biology

Erika Abel, mentor

Disruption of Copper Homeostasis by Copper Chelating Agents in Embryonic Zebrafish

Disruption of copper homeostasis has been well-documented in cancers and neurodegenerative diseases. Recent studies highlight the potential efficacy of metal chelating compounds in the treatment of altered copper phenotypes. Disulfiram (DSF) is a dithiocarbamate that chelates copper, and DSF treatment has been shown to limit growth of cancer cells. These findings stimulated a search for other thione-containing copper chelating agents with capacity to alter abnormal cellular physiology. Thiomaltol (Htma) and dithiomaltol (Httma) are thiol derivatives of 3-hydroxy-2-methyl-4-pyrone (maltol) with high affinity for copper. In the current study, the efficacy of these compounds in eliciting copper-related phenotypes was compared to that of DSF using the embryonic zebrafish model. Embryonic viability and morphology following DSF, Htma and Httma was assessed in the presence and absence of copper supplementation. Treatment with DSF, Htma and Httma induced mortality or malformations characteristic of copper deficiency in a concentration-dependent manner (LC50 = 41.0, 23.0, 6.4 μ M, Htma, Httma and DSF, respectively). Unexpectedly, co-treatment with 2.0 mM copper sulfate (CuSO₄) exacerbated the effects of malformation-inducing levels of Htma, but not DSF; embryos co-treated with CuSO₄ and nonlethal concentrations of Htma exhibited 100% mortality within 24 hours. Additionally, follow-up studies revealed that addition of CuSO₄ to the culture water 15 minutes after treatment with high-dose DSF (but not Htma) could temporarily 'rescue' the embryos from lethality. The differing responses to copper supplementation of Htma versus DSF-treated embryos suggest unique interactions within the copper homeostatic pathway beyond simple direct chelation. Future studies will address the potential intracellular targets of Htma versus DSF.

Tory Hamilton, University Scholar

Paul Martens, mentor

The Christian Medical Missionary's Response to the Health Needs of Northern Nigerian Women Due to Boko Haram Terrorism

The Boko Haram terrorist group (translated as “Westernization is Sacrilege” in Hausa) has negatively influenced women’s health in Northern Nigeria, contributing indirectly to an increase in the prevalence of child marriage in the region, as well as kidnapping and assaulting women and their families directly. This paper examines Nigeria and its health concerns, including child marriage, and the history and activity of Boko Haram. Additionally, it poses three areas in which Christian medical missionaries may assist, based on Corbett and Fikkert’s steps in community development after disaster: relief and rehabilitation, where the medical missionary interacts chiefly with victims of Boko Haram to aid in medical and spiritual healing largely through short-term mission work, and development, involving a medical missionary’s interaction with the larger Nigerian community through and alongside traditional Nigerian healers for the benefit of Nigerian women as a whole. All the efforts of medical missionaries must be made alongside Nigerian women and the greater community, and medical missionaries must be careful to avoid paternalism or coercion in influencing individuals or the community. Utilizing Paulo Freire’s theory of oppression, this thesis argues that Christian medical missionaries can aid women in relieving immediate medical needs, but will make more of an impact on an individual level by rehabilitating women victims of Boko Haram, and on a community level by empowering women through spiritual and medical support, for the betterment of Nigerian as a whole.

Caleb Heimsoth, Mechanical Engineering

David Jack, mentor

The Use of Non-Destructive Testing with High-Frequency Ultrasound on Curved Carbon Fiber Laminates

Carbon fiber composites have continued to become more frequent in major industries such as Aerospace and Automotive, due to their high strength-to-weight ratios. Traditional destructive testing is not always applicable as it renders the part useless for its intended purpose. Therefore, non-destructive testing is necessary to keep the part in place for its intended application. Up to this point, non-destructive testing with high-frequency ultrasound has only occurred on flat composites. Due to the prevalence of curved composites in industry, this thesis focuses on using high-frequency ultrasound A-scan and C-scan techniques to perfect a procedure to scan a curved Carbon Fiber Composite. This thesis conveys this developed technique to scan a curved carbon fiber laminate using ultrasound A-scan and C-scan techniques and presents a study to convey its feasibility.

Rachael Helpenstell, Biology

Gary Elkins, mentor

Complementary and Integrative Methods of Pain Relief during Labor and Delivery: Hypnosis, Acupuncture/Acupressure, and Water Immersion

The pain associated with labor and delivery is multi-dimensional and varies among different women and different stages of labor, both in the intensity and quality of the pain. Regardless of these variations, surveys have found that a majority of women rate childbirth pain very high. Since the 1960s, conventional methods of pain relief during labor consists of epidural analgesics to numb the pelvis and lower limbs. These methods are effective at decreasing pain, but can also lead to slowed labor, decreased hormone release, and increased need for further medical intervention. As a result, many women prefer to have alternative or complementary pain relief during childbirth. The most commonly reported methods in the literature are hypnosis, acupuncture/acupressure, and

water immersion. This scoping review evaluates the benefits of such methods, including decreased cost, decreased adverse side effects, and increased access to pain relief in a variety of settings. Further, complementary methods of pain relief during labor can be effective at decreasing pain with few negative side effects. This review found that hypnosis is the most cost-effective and safest method of the three reviewed.

Lauren Hibbs, University Scholar

Jonathan Kvanvig, mentor

Naturalism and intentionality

The thesis will analyze the intersections of intentionality and naturalism in the area of philosophy of mind. The thesis will use a methodological and reductive conception of naturalism and then will seek to determine whether this type of naturalism is compatible with intentionality. The thesis will argue that the two are compatible when reduction theories are applied to intentional concepts.

Nick Holton, University Scholar

Todd Buras, mentor

A Philosophical Guide to Practicing Medicine: Analyzing Phenomenological, Evolutionary, and Bartian/Thomist Approaches to Medical Practice

U.S. medical students generally graduate with the same collective knowledge of medicine. Each student goes through a block of textbook basic sciences and then a block of clinical education. What separates doctors is not necessarily their knowledge of medicine, but how they use this knowledge in clinical practice. Within the field of philosophy of medicine there are countless perspectives on how to properly practice medicine. This thesis focuses on phenomenological, evolutionary, and Bartian/Thomist approaches to medicine each with their own definition of health as well as a set of advantages and disadvantages. The first three chapters explain each approach and the benefits or drawbacks each imposes on the doctor-patient relationship. The final chapter evaluates all three approaches on consistency, the ability to sort cases well, simplicity, and comprehensiveness. Through this evaluation, it is clear that a Christian Bartian/Thomist theological approach to practicing medicine is the best option for providing high quality healthcare to the patient.

Katherine Hornell, University Scholar

Alan Jacobs and Phillip Donnelly, mentors

C. S. Lewis and the Classics: A Modern Theologian's Medieval Approach to Antiquity

Many readers of C. S. Lewis's beloved works consider a science fiction trilogy an odd divergence from the Oxfordian's expected repertoire. Though Lewis' *Ransom Trilogy* proves distinctive among his other works, the books prove to grow from deep roots in the classical and medieval traditions from which the author and theologian's creative font sprung. Drawing from Virgil, Milton, and Dante to structure his narrative, Lewis integrates existing myth and innovative story-crafting to draw out the truths of ancient mythology that are illumined by the Word and Truth of the gospel myth. With an examination of secondary epic and second meanings, this thesis capstone serves to examine the method of Lewis' story-crafting and consider what contemporary readers may learn from its usage.

Gregory E. Hoy, University Scholar

Troy D. Abel, mentor

Race-and-Sex-Specific Modeling of Infant Mortality: An Empirical Analysis of U.S. National Linked Birth/Death Data

The primary objective of the study of fetal growth and development has been to reduce fetal and infant mortality, including the elimination of excess mortality that is observed in certain race/sex groups (i.e. African American and male infants). To continue this effort, this study utilized national infant birth/death data in three ways: (1) Race- and-sex-specific models of infant mortality were developed that corroborated several current hypotheses regarding mortality differences among race/sex groups as well as generated new hypotheses to explain these differences; (2) Eight different models of infant mortality based on infant birthweight and gestational age were created and compared as to predictive ability; and, (3) These eight models allowed for the generation of 'mortality risk scores' that will enable clinicians and researchers to study predictors of infant mortality in clinical studies that previously have been too small to adequately estimate infant death.

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 Gene Outka 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.

Jessica Huebschman, Neuroscience

Joaquin Lugo, mentor

*Ultrasonic Vocalization Behavior in *-Fmr1* – Knockout Mice Following Early Life Seizures*

Fragile X Syndrome (FXS) is a genetic disorder caused by an expansion mutation of the CGG triplet in the *-fmr-1* gene on the X chromosome. This disorder is characterized by hyperactivity, increased anxiety, repetitive-stereotyped behaviors, and impaired language development. Many children diagnosed with FXS also experience seizures during their lifetime. Previous studies estimate the comorbidity between FXS and epilepsy to be approximately 20%. However, the underlying etiology of this relationship is not fully understood. Ultrasonic vocalizations (UVs) are one tool that may be used to measure early behavioral changes in mice pups. In the present study we used neonatal UVs to analyze early communicative behaviors in a mouse model of FXS, both with and without early life seizures. On postnatal day (PD) 10, we administered 2.5 mg/kg of kainic acid via intraperitoneal injections to male FXS knockout (KO) and wild type (WT) mice to induce continuous seizures (status epilepticus). On PD 12, pups from all groups were temporarily isolated from their dam and ultrasonic vocalizations were recorded. We found several alterations in number and duration of certain type of calls emitted in the KO seizure mice when compared to the WT seizure mice. In particular there were differences in the chevron, complex, composite, short, and downward types of vocalizations. There was an overall decrease in the number of calls made

by the KO seizure group, $p < .05$. Our results provide support that early-life seizures and Fmr1 knockout can impact the communication aspect of behavior in mice during early development.

Helena Hunt, University Scholar

Michael-John DePalma, mentor

The History of the World: Or, Dewayne Boyce As I Recall

This creative nonfiction thesis is composed of a set of personal essays that reflect on the author's relationship with her family, primarily her mother and grandfather. It shows, through an often fragmented and lyrical style, the inheritance they give to and receive from one another, beginning with the traditions of storytelling and deception that are embedded in the text itself. The collection triangulates certain themes and preoccupations, leaving and later returning to habits of restlessness, addiction, and pet ownership above all to find new insights from them. The text is meant to echo an individual's reflection on his or her own life and family past, as one returns to familiar images again and again and recreates what one cannot remember. By the end of this collection, some hope is offered from the repeated cycle of family addiction and manipulation, though that salvation is only found in the same familiar patterns of behavior.

Emily Hurt, University Scholar

Joyce Nuner, mentor

An Examination of Attachment, Bonding and Prenatal Diagnostic Testing in Low Risk Pregnancy and Pregnancies Resulting in Neonatal Death

Mental health and wellbeing following the loss of an infant is a topic of significant interest due to both the short term and long term impact that such a loss may have on individuals and families. While there is an abundance of research on the topic of attachment pertaining both to children and illness, there seems to be a lack of information regarding the psychological impact of a terminal prenatal diagnosis leading to infant death occurring during the neonatal period. The unique circumstances surrounding neonatal death requires that the subject be examined separately from infant deaths occurring outside of the neonatal period or infant death without a prenatal diagnosis. This thesis examines attachment and bond formation of parents in both low risk pregnancies and in pregnancies involving prenatal terminal diagnosis. An in depth review of existing research literature was conducted to explore the topic. The review of the literature examined the impact of prenatal diagnostic testing, including testing that resulted in a terminal diagnosis, on the attachment and bond formation as well as grief response of parents.

Callie Hyde, Political Science

Elizabeth Corey, mentor

Equality or Religious Liberty: An Examination of the Supreme Court Case Obergefell v. Hodges

The gay rights movement is perhaps the most rapidly progressing social and political movement of our generation. Within a mere sixty years, gay rights advocates arrived at the Supreme Court in pursuit of national recognition of same-sex marriage. Justice Kennedy, in his majority opinion in *Obergefell*, extended marriage equality to all through an argument founded in the rhetoric and structure of the civil rights cases *Brown v. Board of Education*, *Plessy v. Ferguson*, and *Loving v. Virginia*. However, the use of these cases causes a substantial change in precedent for religious dissenters. What does it mean to dissent from gay marriage in 2016? Does this

boiling down of religious liberty to Christians dissenting from gay marriage create a dangerous new definition of religious freedom? Finally, what do these unanswered questions mean for tolerance in the modern world?

Jacob Fareed Imam, University Scholar

Alden Smith, mentor

Liturgical Exegesis: Genesis 1-11 As Sung in the Qur'an

Past efforts of interreligious dialogues can be categorized as relativist, irenicist, and systematic. None of these attempts have led to genuine concord and mutual understanding amongst lay religious populations. This project seeks to tread down a new pathway for interreligious dialogue based upon a particular philosophy that emphasizes the aesthetic life. In particular, I argue that the liturgical narrative forum presents the ideal medium for inter-faith understanding. Herein I attempt what I have coined a "liturgical exegesis" of Genesis 1-11 as portrayed in the Qur'an. The primary content of this thesis—comparing some of the shared stories within the Qur'an and the Bible—stands as short examples of the model proposed in the introduction. The thesis wedges together a theological examination of the Holy Texts with an experiential reading of them. This thesis is designed as a preview to a promised religion curriculum particularly designed for Bethlehem University in the Palestinian Territories and for the consideration of His Excellency Fouad Twal for his municipal schools throughout his patriarchate of Jerusalem.

Julia Ioerger, Psychology

Jeff Levin, mentor

Psychological Social Support and its Effects on Longevity and Mortality

This thesis will examine the effects of psychological social support on longevity and mortality. It will pick up where House left off in his 1988 paper and it will offer a thorough summary of recent studies and measures that pertain to the health effects of social support. First, the background and history of the social support concept will be examined. Second, theories and research findings will be summarized and analyzed. Third, limitations and implications for research on psychological social support will be discussed. Ultimately, this thesis seeks to contribute a new, integrative outlook on social support research conducted over the past few decades.

Maddison Johnston, Professional Sales

Chris Pullig, mentor

Business Plan for Eclipse Coffee

With the increased desire for high quality coffee, Eclipse Coffee Bar seeks to provide the Abilene area with a coffee shop where people can gather to seek community, study and work. Eclipse Coffee Bar will capitalize on the ACU student body as well as the two other universities and families located in close proximity to the proposed location. Our mission is to provide a place where people can escape the stress of life and to provide atmosphere that brings people together over their love of coffee. We will have a large shop providing plenty of space for studying as well as for just hanging out. We plan to have a separated study room providing a quiet study area for students who prefer to study in that sort of atmosphere. We will also have different board games that allow our customers to interact with each other, and even an open mic night on Thursday nights to support local artists. Our main competitor in the market is Starbucks, but we will be able to draw customers to our coffee shop because of the location and atmosphere. The major financial cost of this project includes the transformation of the retail space

and purchase of the machines required. We will have a limited menu in order to reduce inventory, and will have select snacks that we outsource from a local bakery and snack provider. We will also have seasonal menus featuring 5 seasonal drinks to increase the demand of certain products during these seasons. We plan to have a soft opening a week before ACU starts school and then have our official opening during move in week, offering half price drinks to drive initial customer demand. Overall, Eclipse Coffee Bar seeks to create a unique coffee shop that drives community within Abilene.

Katherine Kappelmann, University Scholar

Jean Boyd, mentor

Getting to Know You: Social Commentary in Rodgers and Hammerstein's Carousel, South Pacific, and The King and I

In 1943, American musical theater was permanently transformed after Rodgers and Hammerstein's first musical collaboration, *Oklahoma!*, premiered on Broadway. Their approach, which focused on telling stories in a truthful and straightforward way through believable characters and closely interconnected music, lyrics, and script, gave rise to the "integrated book musical" that would dominate Broadway stages for decades. In addition to pioneering a new form of musical, Rodgers and Hammerstein were also remarkable for the way that they mixed entertainment with insightful social critique. This thesis attempts to explore some of the serious social issues which Rodgers and Hammerstein address in three of their most popular musicals: *Carousel* (1945), *South Pacific* (1949), and *The King and I* (1951).

Brad Killingsworth, Biology

Myeongwoo Lee, mentor

Determining effects of copper levels on two MAP-kinase related C. elegans mutants through analysis of changes in vulval phenotype

The MAP-kinase pathway is essential in the formation of *C. elegans* vulva development. Furthermore, copper levels have been suggested to have a potential regulatory effect on this pathway. This study performed a phenotype analysis of vulval phenotype in two MAP-kinase pathway mutants, a gain-of-function Ras protein (LET-60) and a temperature-sensitive and unique loss-of-function RTK (LET-23), in relation to copper sulfate levels in the media. The assay consisted of raising the worms in the presence of copper sulfate and observing the percent of adults expressing the expected vulva phenotype between copper concentrations. While no correlation was shown between copper and the RTK, the Ras mutant showed a decrease in mutant phenotype percentage with an increase in copper levels. This could hint at a potential inhibitory regulation on the protein by the ions. Further trials using more MAP-kinase mutants, studying the effects in the presence of chelators and with inhibited copper transporters would be able to reveal more encompassing and definite conclusions.

Matthew Thomas Klope, University Scholar

Kevin Pinney, mentor

Small-Molecule Inhibitors of Cathepsin L as Potential Antimetastatic Agents

The cathepsin family of cysteine proteases is overexpressed in a variety of cancer cell lines. Cathepsin L, one such protease, is secreted into the extracellular space and plays a critical role in degrading the extracellular matrix, and facilitating the metastasis of cancer cells from a primary tumor body to a secondary site. The Pinney and Trawick

Research laboratories (Baylor University) have engaged in the design, synthesis, and biological evaluation of a variety of small-molecule inhibitors of cathepsin L for potential use as anti-metastatic agents. Two such compounds, **KGP94** and **KGP244**, have shown significant potency as inhibitors of cathepsin L, and these results along with related biological studies have advanced these compounds as promising anti-metastatic agents. A number of novel small-molecule analogues were synthesized that incorporate the benzophenone and benzoylbenzophenone backbones inherent to these two lead compounds in an ongoing effort to expand the library of compounds that could potentially interact with the cathepsin L active site.

Kara Kopchinski, University Scholar

Meghan DiLuzio, mentor

The Incorporation of Foreign Cults by the Romans: A Study of the Cults of Juno Sospita, Aesculapius, and the Magna Mater

The Roman religious system was structured to be continually open to innovations, especially the introduction of new gods and goddesses into their pantheon. This thesis focuses on three cases of this phenomenon and examines the motivations for and effects of incorporating foreign cults. Utilizing a variety of archaeological, literary, and epigraphic evidence, I examine the attitude of the Romans themselves towards these gods, who occupy an unusual space between full acceptance into the Roman state and distance due to their exotic origins. The Romans use these cults to influence their religious, social, and political spheres, advancing their position maintaining peace with the gods simultaneously. In all three cases, the Romans create and maintain a balance between the cult's original, foreign characteristics and Roman practices to create a new Roman identity for the cult.

Parker Korbitz, Neuorscience

Kevin Pinney, mentor

Design and Synthesis of Vascular Disrupting Agents that Bear the Indole Molecular Framework

The discovery of colchicine and combretastatin A-4 (CA4), two naturally occurring compounds that inhibit tubulin polymerization, have spurred great interest in small-molecule anticancer agents that interact with the tubulin-microtubule protein system and function as antiproliferative agents. A sub-set of these analogues target established vasculature feeding tumors and are referred to as vascular disrupting agents (VDAs). It has been discovered that a variety of molecules bearing the indole molecular framework that mimic structural features of colchicine and CA4 function as potent inhibitors of tubulin polymerization and demonstrate promise as VDAs. The Pinney Research Group (Baylor University) previously designed and synthesized OXi8006, an indole-bearing VDA that functions as a powerful inhibitor of tubulin polymerization and demonstrates strong cytotoxicity against a variety of human cancer cell lines. Inspired by these previous studies, a variety of OXi8006 analogues have been prepared by chemical synthesis and evaluated in preliminary biological studies (carried out through collaboration).

Lisa Krause, Business Fellows, Economics, and Finance

Michael Stegemoller, mentor

Christian Virtues in Business: Why It's Better to Not Sell Your Soul

Discussions about Christian virtues and the good life rarely occur within or in relation to the business world. Rather, businesspeople are often typecast as being selfish, greedy and prideful. It is true that in many ways the business sphere encourages and rewards immoral behavior. However, in my thesis I will argue that it is not only possible to be a successful businessperson and a faithful Christian simultaneously, but that the Christian virtues help make people better at business. I will define and examine three vices, pride, greed, and selfish ambition, and

discuss where and why they show up in the business world, what their opposing virtues are, and ultimately why faithful and virtuous Christians in business will find more success than the cliché greedy businessman.

Bunnarack Kuch, Biochemistry

Kevin Pinney, mentor

Targeting Tumor Hypoxia with Potent Vascular Disrupting Agents

Current therapeutic methods highlight the use of vascular disrupting agents (VDAs) in anti-cancer therapy. Through a binding interaction with the colchicine binding site on beta-tubulin, VDAs function as inhibitors of tubulin polymerization, resulting in morphological changes to the endothelial cells lining tumor-feeding vessels, which selectively disrupts blood flow to tumors and results in tumor necrosis. An active area of research inquiry centers on methods to further enhance selectivity of therapeutic agents and strategies towards tumors and targets within the tumor microenvironment, including vasculature. Bioreductively activatable prodrug conjugates (BAPCs) represent one such strategy. BAPCs utilize potent anti-cancer agents as prodrugs to selectively target tumor hypoxia. In order to reduce toxicity and enhance targeting, VDAs are coupled with bioreductive triggers to mask the ability of the resultant BAPCs to interact with the tubulin-microtubule protein system. Under hypoxic conditions which are inherent to many solid tumor cancers, the trigger compounds are cleaved, thus releasing the cytotoxic VDAs site-specific to the tumor. Synthetic pathways for these BAPCs have been developed to effectively couple highly active VDAs with bioreductive triggers.

Lauren Lamb, Political Science

Ivy Hamerly, mentor

Police Corruption in India: Analysis and Advice Based on Similar Global Situations

Corruption in the public service sector is one of the greatest challenges for developing countries to fully democratize, a roadblock to creating a balanced social system prioritizing justice and equality and a detriment to economic growth. I argue that police corruption must be reformed in India for their political, social and economic advancement. After careful consideration of scholarly debates, corruption was defined as those actions that abuse public servant positions for private gain where they are in violation of the laws regulating their actions. This was then applied to India to dissect the ways corruption has plagued their history and is prohibiting their economic, political, and social advancement. Once the situation in India was adequately identified, a more global perspective was achieved using scholarly analysis from police journals and corruption reform books to see an overview of how corruption has been combatted internationally in Brazil, New York City and Singapore. Lessons extrapolated from both successful and unsuccessful attempts to reform corruption were then applied to the political context of India to produce a series of broad recommendations for their corruption reform.

Robin Landrith, Great Texts

Junius Johnson, mentor

In the Dark of Light: A Collection of Short Stories

This thesis celebrates the singular way in which the world can be explored and expressed through the medium of storytelling. A compilation of three original short stories, it centers upon themes of light and darkness, beauty and pain, guilt and salvation, and, above all, the relationship between this earth and the heavenly realm. *The Coat From Midnight* offers a light-hearted narrative exploring the nature of selfishness and its impact on human interaction; *The Lightshafts* tells the fragmentary tale of the friendship of a boy and a light named Lucy; and

finally, *In the Dark of Light* follows the journey of protagonist Timothy Burnes as he makes the ascent into the anteroom of heaven to prove the dishonor of God. The aim of each of these stories, and of the project as a whole, is to gesture toward the interrelationship between the material and spiritual worlds, and thereby to offer a glimpse of the ways in which creation can tell us a tale of the beauty and nearness of God.

Casey Latham, Electrical and Computer Engineering

Charles Baylis, mentor

Dynamic Spectral Mask Optimization

Currently, the spectrum is allocated using outdated methods, where the spectral bands are all purchased by individual users. Part of the outdated system is the idea that a spectral mask is static and is based upon a set of guidelines specified by regulatory agencies. As the spectrum becomes more fully utilized in the lower bands, other methods are being sought to solve the spectrum crisis. One such method is the idea of cognitive radio, where a secondary user can use a specific band if the licensed user is not present. Once the licensed user returns to the spectrum, the secondary user must choose a different band. This thesis describes a dynamic spectral mask, which changes based upon the location, frequency, and acceptable interference power levels of nearby communication handsets. The algorithm seeks to determine the largest gap in spectrum and creates a dynamic spectral mask to prevent the radar from operating above the maximum acceptable interference power level of the communication handsets. After the mask has been created, signals such as the ambiguity function can be optimized using the algorithm.

Lauren Laughlin, Psychology

Rob Miner, mentor

The Truth About Deception

Drawing upon the works of ancient as well as modern day philosophers, I propose that truthfulness is an inherent condition of social life as people are constantly presented with opportunities in their everyday interactions to tell the truth – or to lie. This thesis examines the manner in which people weigh their moral obligations with their social interests to tell the truth, as we are social beings susceptible to insecurities. In order to determine the social contexts under which people deceive others, I will examine people's behavior in varying degrees of relationships with other people, their motivations to deceive others, and their perceived success in their ability to deceive others. By exploring the harm that deception causes to society and individuals, I argue that people struggle to balance their desire to achieve the virtue of truthfulness with their desire for social desirability and acceptance.

Evelyn Doan Trang Le, Biochemistry

Kevin Pinney, mentor

Targeting Tumor Hypoxia with Small-Molecule Anticancer Agents

A vascular network delivers nutrients and oxygen to solid tumors, therefore selectively targeting tumor vasculature with anticancer agents represents a potentially promising therapeutic strategy. Small-molecule anticancer compounds that interact at the colchicine-binding site on beta-tubulin and inhibit microtubule formation can function as cytotoxic agents. In addition, a sub-set of these inhibitors of tubulin polymerization selectively disrupt blood flow to tumors and are referred to as vascular disrupting agents (VDAs). Through their ability to inhibit tubulin polymerization, VDAs induce morphology changes in the endothelial cells lining tumor vasculature, leading to vessel damage and ultimately precluding blood flow to the tumor. A variety of solid tumor cancers contain

pronounced regions of low oxygen (hypoxia). In order to selectively target tumor hypoxia, small-molecule tubulin-binding agents (both antiproliferative agents and VDAs) can be synthetically linked to bioreductive triggers such as monomethyl or dimethyl nitrothiophenes, forming bioreductively activatable prodrug conjugates (BAPCs) that are designed to selectively release the anticancer agent in regions of hypoxia. The natural product combretastatin A-1 (CA1) and a synthetic analogue, phenstatin, are potent inhibitors of tubulin polymerization ($IC_{50} = 1.9 \mu\text{M}$ and $1.0 \mu\text{M}$, respectively) and CA1 functions as a VDA. The focus of this study centers on the synthesis of CA1 BAPCs that incorporate a monomethyl trigger and a phenstatin BAPC bearing a dimethyl trigger.

Lauren Lee, University Scholar

Victor Hinojosa, mentor

Becoming the Church in the Face of State Violence: Lessons from Latin America

During the Cold War, both Chile and El Salvador experienced times of extensive state violence, including the torture and disappearance of many of their own citizens. Ignacio Ellacuría, a Jesuit priest and liberation theologian, acted as a prophetic voice during the Salvadoran Civil War. I will examine his theology as a narrative of structural sin, redeemed through liberation, with the Church acting as a 'historical sacrament.' William Cavanaugh, an American theologian, assessed the use of torture in Chile as a tactic which tears apart both individual and social bodies. While the state uses torture to rend the society, and nationalism to bind atomized individuals to itself, he sees the re-membering of the Church in the Eucharist as the proper response to state violence. Through these authors, we see a Church that takes seriously its concern for the poor (in body and spirit) and we learn to seek unity that distinguishes the Church from the world as a space of faith, hope, and love.

Natasha Lie, Biochemistry

Erich Baker, mentor

Using graph theory and data analysis to identify genes that have possible candidacy of association with retinitis pigmentosa: GeneWeaver

Retinitis pigmentosa (RP) is a retinal degenerative disorder that affects about 1 in 3,000 people. The disease is genetic in cause, and currently there is no cure. The genetic cause of the disease may be contributed to one of several different genes, underscoring the complex genetic underpinnings of this disease. The information required to determine which genes are potentially causative for RP may exist, but it is difficult to determine which genes are most suitable for study because of the immense wealth and breadth of available information. In other words, large scale heterogeneous species-specific data often obfuscates the true causative genetic background of RP. In this study we describe a method of identifying genes that may contribute to RP using the bioinformatics techniques of graph theory and database utilization. We report a potential ranked list of genes in which mutations are likely causative of RP.

Brandy Ligocky, Biology

Thomas Conry, mentor

Zebra Mussel Awareness in Central Texas

Since the introduction of the Zebra mussel, *Dreissena polymorpha*, into the United States, freshwater food webs have been drastically altered. This mussel filters phytoplankton, the basis for aquatic food chains, which causes secondary changes, like the reduction of sportfish and waterfowl populations. Zebra mussels also cluster in water pipes costing cities up to \$3 million to keep water treatment plants and power plants operational. Ultimately, the cheapest and most effective method for fighting Zebra mussels is promoting Zebra mussel awareness to stop these invasive species from ever entering a lake or stream.

Avery Lill, University Scholar

Sarah-Jane Murray, mentor

Around the Color Wheel

This children's story tells about adventures of a young girl who goes on a hot air balloon adventure to find colors, which disappeared from the world five years ago. In addition to the creative work, which is the primary content of the thesis, the author details her writing process and discusses the relationship between philosophy and children's literature.

Mitchell Lockyear, University Scholar

Greg Garrett, mentor

Nora in Phantasmagoria

Nora in Phantasmagoria is a fantasy novel for children inspired by the works of George Macdonald and Lewis Carroll. This thesis uses the medium of fantasy to provide new light in examining our beliefs and assumptions. In the story, Nora steps out of her world when she gets off her train at the abandoned train stop 13. Suddenly she is in a world where she constantly meets with the unexpected. Nora journeys through a cave lit by stars to a country of woodcutters who have chopped down all their trees and have nothing left to do. She is enslaved in a molasses factory, only to escape into the middle of a hundred year old conflict in which a goat plays a principle role. At the end of her journey, she must confront her fears and embrace the possibility of making a difference even at the cost of her own life.

Sara Long, University Scholar

Bill Neilson, mentor

The Seasonality of Appendicitis in Relationship to Pollen Counts in the Dallas/Fort Worth Area

Seven percent of individuals will experience appendicitis in their lifetime, however little is known about the cause of the illness. In recent years it has been observed that appendicitis exhibits a seasonal trend but there is uncertainty in regards to the intensity of such trend. Researchers have attempted to link the seasonality of appendicitis to various factors that exhibit a similar pattern in order to elucidate its cause but have had little success. This thesis explores the seasonal trend and potential relationship between the number of appendicitis cases and pollen concentrations in the Dallas/Fort Worth area. Using statistical methods, such as the Kendall tau

correlation coefficient, it was found that the number of appendicitis cases is not correlated to pollen concentrations but the number of appendicitis cases does follow a modest seasonal trend.

Laura Mahler, University Scholar

Joseph Stubenrauch, mentor

The Not-So-United Kingdom: Nationalism in Scotland, England, Wales, and Northern Ireland

The 2014 Scottish Referendum shed light on a problem that has faced the United Kingdom for the past few decades: nationalism. The rise of nationalism in each of the four nations of the United Kingdom poses a threat to the union's very existence. In the celebrated 1992 article "Britishness and Otherness," historian Linda Colley argues that the presence of an external Other causes the four contingent nations of the United Kingdom to bind together against this external threat. Absent this threat, the four nations become more aware of their internal differences, contributing to the rise of nationalist movements. This thesis uses newspaper articles, letters to the editor, opinion polls, and analysis of political discourse to explore perceptions of national identity and nationalism in Scotland, England, Wales, and Northern Ireland to determine the factors that are contributing to the rise of nationalist movements in each of these countries. These sources were used to determine if those making unionist arguments identified an external Other and if those making nationalist claims were more prone to civic nationalism or ethnic nationalism. Much of this analysis seeks to determine if the country is witnessing a nationalist *movement* or simply a nationalist *mood*. A nationalist movement pushes for constitutional change – or even independence – while a nationalist mood is primarily concerned with issues of national identity. The purpose of this thesis is to explore nationalist rhetoric in each of the nations of the United Kingdom to better understand the sources of growing nationalism, its potential impact on the Union, and its relation to Colley's initial thesis.

Ryan Malthaner, Mathematics

John Davis, mentor

The Method of Characteristics: A Study of Waves

The method of characteristics is a powerful and intuitive tool for obtaining solutions to the PDEs that model various waves. This method takes advantage of the underlying geometry of the physical phenomena to find a family of curves which can be used to construct the final solution surface. During the course of this paper, this method will be showcased using the advection equation in its various forms: homogeneous, nonhomogeneous, and generalized linear. In each case, new properties of the method of characteristics will be explained, culminating in the application of the theory to the nonlinear advection equation to describe shockwaves and their properties.

Kathleen Marcos, Biochemistry

Suzy Weems, mentor

"Food-Brand Knowledge Effects on Taste Preferences of Pre-School Aged Children from Two Distinct Socioeconomic Environments"

In the United States alone, childhood obesity rates have skyrocketed, nearly tripling in children as young as three- to five-years-old. Great lengths have been taken to understand the contributing factors of obesity, such as heredity, behavior, and nutrition, in order to combat the epidemic. In this study, the effects of an individual's consumer environment on his or her food choices are explored. Two populations from distinct environments, which were defined by socioeconomic classes, are compared through an environmental survey,

brand knowledge test, and taste preference test. These methods collected data that was then used to gauge advertisement exposure, brand recognition as a result of exposure, and branded product preference. While no clear conclusions could be drawn from the data, both populations showed tendencies to positively recognize brands unique to their corresponding environment as well as to choose branded products over unbranded products.

Jemima McCluskey, Biology

Ryan S. King, mentor

Effects of Titanium Dioxide Nanoparticles on Bacteria Community Composition Under Snail Grazing Pressure

In 2013, the King and Matson labs at Baylor University conducted an outdoor stream mesocosm study at the Baylor Experimental Aquatic Research (BEAR) facility, using wastewater treatment plant effluent and P25 titanium dioxide nanoparticle (TiO₂NP) concentrations of 0 (control), 0.05 (low dose treatment), and 5.0 (high dose treatment) mg L⁻¹ TiO₂. Pools at the top of each of the 12 streams were stocked with 200 snails. A study of the effects of interactions between snail grazing and TiO₂NPs on the algal and bacterial components of the periphyton in the pools showed that there was a slight decrease in algal density in the high dose treatment samples relative to the control samples. In the low dose treatment samples, however, there was a significant decrease in algal density relative to both the control and high dose treatment samples. The densities of both the algae and living bacteria decreased in the low dose treatment samples. In contrast, only the bacterial densities decreased in the control and high dose treatment samples. In order to explore the mechanisms driving the trends observed in the 2013 stream mesocosm study, I will be conducting a stream microcosm (Baby BEAR) study. Two species of snails will be used, and the periphyton will be exposed to similar concentrations of TiO₂ nanoparticles that were used in the outdoor mesocosm study. For the present study, I will be analyzing changes in bacterial mortality as well as changes in bacteria community composition.

Landon McGee, Philosophy

Todd Buras, mentor

The Socratic Circle: An Unorthodox Reflection on Death, Church, and the Mind-Body Problem

This thesis frames and explores the central issues in Philosophy of Mind through the lens of a fictional memoir. The memoir revolves around a young intellectual named Skylar and tracks the evolution of his thoughts as he reckons with the impending death of his best friend. Though Skylar and the other characters articulate many of the standard contemporary stances on the so-called Mind-Body Problem, no final answer to the problem is given. Instead, the work ends with the introduction of the concept of the Socratic Circle: the idea that the best outcome of a philosophical inquiry is not a definitive set of propositions about a philosophical problem, but an appreciation of the problem's complexity, and an awareness of one's own lack of understanding.

Garrett McMillan, University Scholar

Timothy Burns, mentor

Catholic libertarianism?

What are the similarities and difference between Catholic political thought and Libertarian political thought? What are the chief principles of libertarianism, and is it a self-sufficient political philosophy? What are the chief principles of Catholic political thought, and does it have anything to learn from libertarianism? To what extent, and in what ways, can the political thought of these two traditions be considered compatible, and to what extent and in what ways do they conflict with each other? This paper will first examine the origins of libertarian thought, the concept

of natural rights, and the goal of economic prosperity among the liberal political philosophers of the 17th century, alongside more contemporary libertarian thinkers. Second, this paper will examine an interpretation of the political thought of St. Augustine and St Thomas Aquinas, alongside a comparison of the doctrine of natural rights vs. the doctrine of the natural law. Finally, this paper will examine two justifications by contemporary Catholic authors of liberalism, the first through a thorough analysis of the social encyclicals, and the second through a joint examination of Catholic principles and economic analysis.

Kristina Mentakis, Nonprofit and Developmental Marketing

John Cunningham, mentor

Crafting for a Cure: An Execution of Niche Marketing Strategy

Niche marketing provides different and unique opportunities that have thrived through the revelation of modern technology, such as the Internet. Moreover, the rise of social media has encouraged a cultural phenomenon of revitalization and revolution in the popularity of handmade objects. Through the creation of a knitwear collection, I implement marketing tactics in an effort to successfully make an impact on a nonprofit organization. This thesis demonstrates a first-hand perspective on the intricacies and difficulties of a new business performing niche marketing from product formation through analysis and evaluation.

Abby Miller, English and History

Tracy Hoffman, mentor

Christopher Columbus: From Genoese to American

The character of Christopher Columbus makes appearances in the literature and language in countries and cultures throughout the world. In recent years in the United States Columbus has become most closely associated with the atrocities committed against Native Americans in the earliest colonial period. However, Columbus was once a very popular figure in American literature, most famously popularized by the biography *The Life of Christopher Columbus* written by Washington Irving. Interestingly, Irving wrote the biography while visiting Madrid. Although away from his native country, Irving's biography reflects his purpose of depicting Columbus as an American hero. While others have explored this topic, my discussion of Irving's biography further discusses parallels between the character of Columbus and that of Benjamin Franklin, as depicted in Franklin's autobiography. Irving's biography, while it does contain inaccuracies and invented scenes, is still an important component of our understanding of American identity.

Anuja Mohapatra, International Studies

Ivy Hamerly, mentor

Out of Saffron Ashes: Revival of Hindutva in India

In early 2014, citizens of the largest democratic nation on the planet turned up in record-breaking numbers to vote in India's sixteenth Lok Sabha elections. This election was particularly monumental for several reasons: firstly, it broke records with the largest voter turnout in Indian history, and secondly, it resulted a landslide victory for the right-wing Bharatiya Janata Party (BJP), delivering the long-standing Congress party its largest defeat in history. The 2014 victory of the BJP is the latest high point in the recent revival of Hindu nationalism(Hindutva) in Indian politics. In this thesis, I trace the Hindutva movement to its pre-independence roots, analyse the causes of its revival through the BJP in the 1990s and examine its future role in the Indian political system.

Cole Moore, Health Science Studies

Michael Thomas, mentor

The Progression of Societal Reflection in Science Fiction through Wells, Lewis, and Bradbury

Science fiction has proven to be a tremendous force with a unique power to change individuals, steering them to consider inventive alternatives. Three of the great authors of early science fiction are H.G. Wells, C.S. Lewis, and Ray Bradbury. All three share a passion for the creative, contributing multiple works to the genre leaving an impact during their time period. As the genre changed, these authors wove societal context into their works, exemplifying struggles and weaknesses of their times, and potential outcomes if society continued to move in those directions. To understand the more subtle changes and reflections of society, this thesis looks at each author's human and non-human (alien) interactions, foreign environment through settings, and impacts of advanced technology. Observing these changes between authors, the intent is to show differing mindsets from each author's era: Wells and the Turn of the Century, Lewis between the World Wars, and Ray Bradbury in the early Cold War. Each main element of style is analyzed on its own to display the lens the text is viewed in. Afterwards, all three authors are compared against each other to see explicit purposes in their works.

Mallory Myers, University Scholar

Allyson Irom, mentor

Healthcare for Hispanic Immigrants: Improving the Accessibility and Quality of Preventive Services

There are over 20 million foreign-born Hispanics currently living in the United States. Research shows Hispanic immigrants are healthier than U.S. natives upon arrival, yet their health deteriorates over time. Lifestyle changes coupled with lack of health care increase the prevalence of preventable chronic conditions. In the past three decades, U.S. federal and state policies defining the extent of preventive health services for immigrants have been inconsistent and controversial. Some experts have called for expansion of health insurance coverage for Hispanic immigrants; however, lack of insurance is not the only barrier to obtaining health care. Other difficulties include unfamiliarity with U.S. health care, discrimination, and sociocultural differences. When Hispanic immigrants do access preventive resources, the quality is threatened by the language barrier, misunderstanding in the patient-provider relationship, and a shortage of providers. Removing the obstacles to accessible and quality preventive care for Hispanic immigrants will require concentrated, culturally-specific efforts from community health workers, providers, medical educators, and government administrators. Prevention of chronic disease in the Hispanic immigrant population is justifiable from public health, economic, and ethical points-of-view.

Soraya Naqvi, Biology

Clay Butler, mentor

Establishing a Leadership Identity in a Small Group Among Peers

This thesis is a conversation analysis focusing on the discourse strategies used by a leader in a small group meeting in order to maintain interpersonal relationships and give task-oriented direction. The leadership discourse strategies accomplish relational and transactional goals, such as promoting participation, softening criticism, and delegating tasks. Examples are taken from a one-hour video-recorded meeting in order to demonstrate how the leader fulfills relational and transactional goals. Additional factors contributing to the specific leadership style in the study are considered in relation to the discourse strategies used to establish a leadership identity.

Will Nations, Computer Science

Matthew Fendt, mentor

Interpersonal Ethical Communication via Virtual Environment Influences

Modern video games permit players to interact with each other through direct voice and text chat, joint gameplay (competitive or collaborative), and by sharing user-generated content. In search of a more narrative-embedded approach, this paper provides the details of a study in which players are tasked with learning about other players merely through interactions with third-party Non-Player Characters (NPC). The results of the study show the potential for game designers to influence the way people perceive and interact with others as well as games' effectiveness at communicating high-level concepts such as ethical dilemmas, politics, and philosophy to players.

Shantha Nithiananda, University Scholar

Karol Hardin, mentor

The Effects of Physician Voices on Interpersonal Communication and Patient Adherence

Patients' adherence to their doctor's instructions is important for successful healthcare outcomes. Moreover, previous studies have shown that doctor-patient communication greatly affects patient adherence (Davis, 1968a; V. Francis, Korsch, & Morris, 1969; Fremon, Negrete, Davis, & Korsch, 1971; Gunby, 1982; Hall, Roter, & Katz, 1988; Hall, Roter, & Rand, 1981). Physician communication skills, however, are a difficult variable to define and study. This thesis describes the linguistic construct of the Doctor, Educator, and Fellow Human voices detailed by Marisa Cordella (2004) in her discourse analysis of medical interviews. These voices are used to describe the goals of a doctor-patient interaction and the strategies used to accomplish them. Analysis of existing studies involving patient-physician communication demonstrated that any use of the Educator or Fellow Human voice increased patient adherence, whereas the benefits of using the Doctor voice could be negated by the absence of another voice. The thesis offers a physician voice-based discourse analysis method that was used in examining transcripts of patient-physician interaction. The results showed that Cordella's physician voices were associated with patient adherence and therefore may be useful for examining medical communication in future studies. Finally, recommendations are offered regarding physician education when communicating with patients.

Francesca Norris, University Scholar

Billie Hulke, mentor

The Pathway to Proficiency: The Role of Grammar in Second Language Teaching and Learning

The role of grammar in the foreign language classroom is a heavily debated topic in the arena of second language education. Historically, there have been many shifts in the prevailing idea of grammar presentation. Traditionally, grammar played a heavy role in foreign language education, often serving as the only activity in the classroom. In recent years, there has been a push for implicit grammar presentations focusing more heavily on the use of language for communication. A review of language-learning theories and current language acquisition research was performed to elucidate how grammar should be taught. A survey of language educators was conducted and revealed that educators preferred teaching grammar implicitly and using authentic materials. Research shows that explicit and implicit grammar instruction has merit. In order to comply with the new World-Readiness Standards of the American Council on the Teaching of Foreign Languages, language instruction should emphasize the links between language, communication, and culture. Today, teaching grammar in isolation is no longer acceptable to prepare students with "real-world" language skills. Thus, an eclectic approach which integrates authentic materials and a blend of explicit and implicit grammar more clearly define 21st language teaching and learning.

Christa Olbrey, University Scholar

Eric Martin, mentor

An Aristotelian Perspective on Canine Friendship

As "man's best friend" dogs have taken an important role by the side of humans. Dogs are different from other animals in that humans have adopted these four legged followers for help in daily tasks and even companionship. People took notice of the dog's faithful nature and work ethic, breeding for physical and mental traits that allow dogs to fit better into human society. We brought dogs into our lives and, with this, assumed responsibility for their well being. Many dogs are treated kindly by humans, in a way that one would treat a friend. "Man's best friend" is not simply an idiomatic expression, but possesses meaning that some people truly identify with in their relationships with dogs. In his *Nicomachean Ethics* Aristotle outlines types of friendships and what kind of reciprocity should be expected out of each kind of friendship. I use Aristotle's model of friendship to explain how dogs and humans can be considered friends through a philosophical framework. Thinking of dogs as potential friends provides a different perspective to how we might treat dogs in a variety of social and ethical situations, such as pet ownership and animal experimentation.

Justin Matthew Olivas, Biochemistry

Kevin Pinney, mentor

Synthesis of Small Molecule Vascular Disrupting Agents And Cathepsin B Cleavable Linker To Develop ADCs For Cancer Treatment

Vascular disrupting agents (VDAs), a subclass of vascular targeting agents (VTAs), are becoming a new method for selectively delivering cytotoxic drugs to cancer cells. A recent class of VDAs that have demonstrated significant potency comparable to colchicine and combretastatin A-4 are **KGP18** and **KGP156**, developed by the Pinney Group and coworkers (Baylor University), which utilize a benzosuberene molecular scaffold. **KGP18** and **KGP156** are both potent inhibitors of tubulin polymerization with IC_{50} values of approximately 1.4 μ M and 1.2 μ M, respectively, that are comparable to combretastatin A-4 (CA4) which has an IC_{50} value of 1.0 μ M in this assay. Synthetic efforts have been advanced to conjugate these benzosuberene analogues to antibodies, via a conditionally stable linker, in order to produce antibody-drug conjugates (ADCs), which are an emerging class of anticancer therapeutic modalities that selectively target cancer cells (or an antigen in the tumor microenvironment) while leaving healthy cells unharmed. When the ADCs internalize within a target cell, the linker is then cleaved via a mechanism catalyzed by an enzyme or a change in pH. In this study, the benzosuberene derivatives **KGP18** and **KGP156** are synthesized, as well as the linker that is used for the ADC, followed by subsequent conjugation of **KGP18** with the linker.

Chelsea Orlando, Chemistry

William Neilson, mentor

Catholic Healthcare in the United States: A Study of the Adherence to the Sterilization Religious Directives of Ascension Health in Texas

The United States Conference of Bishops created the *Ethical and Religious Directives (ERDs)* in order to provide clear ethical rules for American Catholics. Included was the prohibition of both female and male sterilization: the tubal ligation and the vasectomy. In some instances, Catholic hospitals continue to perform forbidden procedures to keep the business of a not devoutly Catholic populous. In order to determine the degree of adherence to the ethical guidelines, post partum tubal ligations and vasectomies were tabulated for hospitals in the Ascension Health group in Texas. The data demonstrated that the hospitals are performing these procedures at similar rates

as non-Catholic hospitals in the state. The lack of a unified Catholic behavior may negatively impact the upcoming Supreme Court cases contesting the *Affordable Care Act*. If the current trend continues, hospitals that completely follow Catholic mandates may no longer exist.

Bethany Page, University Scholar

Trent Dougherty, mentor

Theodicy in an age of Entitlement: an Examination of Western Cultural Consciousness and its Relation to the Individual's Perception of God in the Modern Age

The question of how an omnipotent, omniscient, all good God could allow the presence of evil in the world has arisen in every age and every culture wherein the idea of God is elevated to the highest standard. Different cultures throughout the history of Western civilization have responded to this problem of evil in various ways, but never has there been such a demand for a justification of God's goodness in the face of the presence of evil as in the modern age. While this thesis does not explicitly seek to give a justification of God's goodness, it does aim to explain why the modern age is outraged by the problem of evil, perhaps more than any precedent. It does so by examining the cultural environment of the individual and how the individual perceives himself in relation to the community and to God.

Jackson Perry, University Scholar

Nathan T. Elkins, mentor

Sarcophagi in Context: Identifying the Missing Sarcophagus of Helena in the Mausoleum of Constantin

The Mausoleum of Constantina and Helena in Rome once held two sarcophagi, but the second has never been properly identified. Using the decoration in the mausoleum and recent archaeological studies, this thesis identifies the probable design of the second sarcophagus. This reconstruction is confirmed by a fragment in the Istanbul Museum, which belonged to the lost sarcophagus. This is contrary to the current misattribution of the fragment to the sarcophagus of Constantine. This is only the third positively identified imperial sarcophagus recovered in Constantinople. This identification corrects misconceptions about both the design of the mausoleum and the history of the fragment itself. Using this identification, this thesis will also posit that an altar was originally placed in the mausoleum, a discovery central in correcting misconceptions about the 4th century imperial liturgy. Finally, it will posit that the decorative scheme of the mausoleum was not random, but was carefully thought out in connection to the imperial funerary liturgy itself.

Kelsey E. Petrie, Baylor Business Fellows, Supply Chain Mgmt, and Marketing

Elisabeth Umble, mentor

Patagonia Inc.'s Sustainable Supply Chain Initiatives and Their Contribution to Company Brand

Sustainable supply chain management practices in business involve making decisions about products from design to disposal with regards to the way those decisions impact people, profit, and the planet. Understanding current trends in sustainable supply chain management as well as company brand management is necessary to draw conclusions about how these two areas of business are interrelated. Through the analysis of three separate sustainable sourcing initiatives at Patagonia Inc. and the subsequent impact on the brand image of the company, this thesis discusses the effect of sustainable supply chain management implementation on a company's brand.

Marisa Pinson, Biochemistry

Chris Kearney, mentor

*Evaluating and Isolating Promoters in *Impatiens walleriana*: Towards the Development of Mosquitocidal Nectar*

Mosquito-borne diseases, such as malaria, are a persistent problem, leading to numerous deaths across the world that could easily be prevented by better control of mosquito populations. Because the main source of energy for many mosquitoes are the sugars present in nectar, a novel approach for mosquito control that would complement methods already in use would be to develop plants that express mosquito-specific toxins in their nectar. Nectar-specific promoters would be a necessary step in developing plants that express mosquito toxin solely in their nectar. One nectar-specific promoter that has been found and sequenced is the pNEC promoter of *Nicotiana langsdorffii* X *N. sanderae*. To test the effectiveness of this promoter in *Impatiens walleriana*, pNEC was combined with enhanced green fluorescent protein (EGFP) and used in the transformation of *I. walleriana*. Kanamycin resistance was used to select transformants; presence of EGFP in nectar would then prove successful promotion of expression by pNEC. When no EGFP was found to be present, further investigation determined that the transformations were not successful, despite the kanamycin selection step. However, a means for potentially isolating the nectar-specific promoter endogenous in *I. walleriana* was also tested. Thermal asymmetric interlaced PCR (TAIL-PCR) was successfully used to isolate the 26S promoter of *I. walleriana*, verifying it as a method to eventually isolate the IW23 promoter of *I. walleriana*.

Conner Douglas Reynolds, Neuroscience and Biology

Joaquin N. Lugo, mentor

The Effect of Early-life Status Epilepticus on Ultrasonic Vocalizations in Mice

The purpose of this study is to investigate the effects of kainate-induced early life seizures on vocalization behavior and intracellular signaling pathways involved in nervous system development. On postnatal day 10, male and female 129SvEvTac mice received a single intraperitoneal injection of kainic acid 2.5 mg/kg to induce 1-2 hours of status epilepticus. On postnatal days 11 and 12, mice were removed from the home cage and isolation-induced ultrasonic vocalizations (USVs) were recorded using the UltraVox software. The PI3K-Akt-mTOR and Canonical Wnt intracellular signaling pathways in the brains of pups on postnatal day 12 were investigated by western blotting analysis. There was significant suppression of USV quantity and total duration at the 50kHz frequency on postnatal day 12 following seizures. These results were both sex-specific and associated with changes in the PI3K-Akt-mTOR intracellular signaling pathway. These findings support the growing body of evidence for USV behavior as an early behavioral marker of neural deficits.

Luke Richardson, Biochemistry

Chris Kearney, mentor

*Evaluation of the *I. walleriana* extrafloral nectar proteome and its role in microbial defense*

For many years, the scientific community has observed how plants mediate mutualist interactions with aggressive defenders, such as ants, through production of metabolite-rich extrafloral nectar (EFN); however, recent study has elucidated enzymatic mechanisms carried out in nectar by which plants protect vulnerable tissues from microbial infestation. For example, pathogenesis-related (PR) proteins expressed in *acacia* myrmecophyte EFN demonstrated pronounced antifungal activity. But as this has only recently become a subject of interest, relatively few nectar proteomes have been fully evaluated and characterized. The EFN proteome of *Impatiens walleriana*, a common flowering plant native to East Africa, falls among this group. Given its abundant secretion of EFN, attractiveness to mosquitoes and heavy expression of nectar proteins, *I. walleriana* was determined by the Kearney lab to be an excellent candidate for development as a model plant for the nectar-mediated delivery of transgenic proteins. In pursuance of this objective, this study evaluates the *I. walleriana* EFN proteome and its role

in defense of nectary tissues against microbial infestation. Indeed, the EFN had mild antimicrobial activity on *E. coli* but a much more pronounced effect on yeast growth. Furthermore, activity indicating the presence of peroxidase class enzyme, one of three classes of PR proteins found in *acacia* myrmecophyte EFN, was detected and quantified in the *I. walleriana* EFN. Since protein sequences involved in specific substrate binding and activity are likely conserved, this observed peroxidase activity might yield assurance of quality peptide sequences acquired from bottom-up proteomic analysis of *I. walleriana* nectar proteins, helping drive forward development of *I. walleriana* as a model system.

Ceon Rumphs, Music Education

Jean A. Boyd, mentor

Le Sacre du Printemps: A Critical Analysis of a Twentieth Century Masterpiece

Political, social, and cultural revolutions heavily plagued the twentieth century. Particularly, these cultural revolutions struck at the core of a people's identity, and precipitated significant change. One such cultural, and more specifically artistic revolution, in 1913 has continued to live in infamy. The composition of Igor Stravinsky's landmark ballet *Le Sacre du Printemps* left an indelible mark upon the European musical landscape and, consequently, expanded the realm of musical possibility. The collaboration between Stravinsky as composer, Nijinsky as choreographer, and Roerich as artist engendered a unique work of art, the likes of which had not been attempted before. Yet on the night of its premiere, the Parisian audience at the Théâtre des Champs-Élysées hissed in disapproval, resulting in one of the most (in)famous riots in musical history. Interestingly enough, the next few performances of the work were greeted with overwhelming applause and admiration. Contemporary composers of Stravinsky accepted the dramatic change brought about by the ballet's score, and created more modern compositions utilizing the same degree of compositional freedom expressed in *Le Sacre*. This investigation seeks to examine the nature of the ballet's transformation from abhorrence to admiration by considering the numerous inspirational and compositional factors surrounding its creation. In essence, the focus of this investigation is to answer: what was so iconoclastic about the work that the audience in 1913 rioted, but even the next few performances of the work resulted in praise?

Erin Russo, Classics

David Lyle Jeffrey, mentor

Redefinition of the Immortality of the Soul with Respect to the Resurrection of the Body

The immortality of the soul and the resurrection of the dead are two of the most widely treated topics among early and medieval Christian writers. I argue that the foundational Christian doctrine of the resurrection of the body is not reconcilable with the Platonic concept of the immortality of the soul; likewise the idea of the soul's immortality seems to shift and eventually diminish in value throughout the early and medieval periods, as shown through the prayers and teachings of the church. Looking at the origins of somatic resurrection and its difference from Platonic immortality, the New Testament and Patristic teachings on the two, the prayers and funeral traditions of the post-schism Church, and the *Speculum Humanae Salvationis* manuscript, I will attempt to redefine Christian immortality with respect to Christian resurrection from a philological perspective. While the resurrection of the body is an uncontested doctrine among believers, the immortality of the Christian soul takes on different meanings over time, and requires standard definition. I find the term "immortality" insufficient for relating Christian immortality and psychosomatic resurrection. Therefore, I shall endeavor to create a new term for Christian psychosomatic eternal life, with the resurrection of the body acting as the focal point for redefinition – a term that encompasses the properties of the soul, the truths of Christian resurrection, and an eschatological hope for the Second Coming of Christ.

Kyle Sanders, History and Religion

David Whitford, mentor

Mercier's Ghost: A Historical Analysis of an Account of Ghostly Visitation in Early Modern France

Christophe Mercier, a French monk, recorded a brief account of a ghostly visitation that occurred in 1628 to a lay woman named Huguette Roy. The account claims that, as Huguette was sick and about to give birth, she was visited by a ghost who served as her nurse and chambermaid. After several such visits and priestly consultations, the ghost reveals herself to be Huguette's death aunt, Leonarde. Leonarde explains that she is trapped in the fires of Purgatory and can only be sped out by Huguette's honoring several saints at their shrines. This account is fueled by several motivations, one of which is a desire to keep Huguette out of trouble for witchcraft or receiving a false vision from a demon. In order to understand how and why Mercier achieved this goal, one must evaluate it both against the Witch Craze as a whole and the regional beliefs on the supernatural as represented in Pierre le Loyer's *a Treatise of Specters or Strange Sights, Visions and Apparitions Appearing Sensibly unto Men Wherein is Delivered, the Nature of Spirites, Angels, and Divels: Their Power and Properties: as also of Witches, Sorcerers, Enchanters, and such like* by Pierre le Loyer.

Lauren Sawyer, University Scholar

Alden Smith, mentor

Life, a labor void and brief: Viewing Ebola through the Lens of Lucretius and Virgil

The reality of death through disease has influenced the behaviors and actions of humankind since the beginning of history. Although the concept of disease has been present throughout our history, and has evolved with our ever-increasing knowledge of its sources and causes, society is still ravaged by illness-causing microbes and struggles with how to confront the inevitability of death. In looking back to ancient authors and historians, such as Thucydides, Lucretius, and Virgil, and their accounts of plague and disease, I hope to elucidate the inherent reactions of human nature to disease and explore their implications in society. Furthermore, as each of these authors is writing to a specific purpose, illuminating this purpose in the context of the plague will perhaps lend hope - or even a cure - to the fear of death from disease.

Andrea Schlosser, Business Fellows

Scott Cunningham, mentor

The Impact of Supply-Side Abortion Regulation Policies in Texas

Although abortion became formally legalized across the nation in January 1973, abortion regulation and policy has continued to be a center point of political and ethical controversy. This is due largely in part to the power given to states to regulate abortion in cases of maternal health dangers or viability of a fetus. States have utilized this power in vastly different ways, usually depending on the political makeup of state legislators. Republican states tend to have tighter regulations on abortion, while more liberal states generally have looser policies. This paper explores the effects of abortion legislation on abortion trends and birth trends in Texas. In the past, the majority of abortion regulation has focused on the consumer. For example, the Texas Women's Right to Know Act, passed in 2003, requires that women requesting an abortion must endure a 24-hour waiting period and be educated by her provider about fetal development before having an elective abortion procedure. Policies that regulate the consumers of abortion are referred to as demand-side abortion policies. Newer abortion policies, referred to as supply-side policies, have focused on regulating abortion providers. Notably, House Bill 2, passed in 2013, required that abortion providers meet certain levels of education and have hospital admitting privileges. This law also mandated that abortion clinics meet the requirements for ambulatory surgical centers, requiring certain size

standards and re-zoning. Supply side regulations in Texas have closed over half of all abortion clinics since 2013. As a result, Texas has seen sharp declines in abortion rates and birthrates.

Kelcy Schmidt, Biochemistry and Biology Chris Pieper, mentor

Speak out on Behalf of Those who have no Voice

This project will evaluate the tactics and strategies of the nonprofit religious activist group “Jesus Said Love,” which advocates for women in the commercial sex industry. Analysis will be conducted by collected key organizational and ideological variables from similar organizations. Data will be collected through interviews with leaders and publicly available information about the organization. The introductory sections will provide background on each organization. The analytical sections will describe and compare tactics and community relations for each organization. The concluding sections will summarize and synthesize findings from each organization and indicate specific strengths and weaknesses of Jesus Said Love.

Rachel Schultz, English

Ralph Wood, mentor

Eves, Angels or Human Beings: G.K. Chesterton’s Female Characters

G.K. Chesterton remains one of the most heralded authors of the twentieth century. However, his views on “The Woman Question,” as outlined in his polemical essays, invite skepticism at best. In order to provide a more complete understanding of Chesterton’s perception of muliebrity, this thesis analyzes major female characters within Chesterton’s fiction: specifically the epic poem, *The Ballad of the White Horse*, the sweeping farce *The Flying Inn*, and the allegorically charged *The Ball and the Cross*. To achieve this purpose, the thesis works from principles of feminist criticism, testing whether each female character is portrayed with their own irreducible integrity or is flattened into a prop, whose sole purpose is to advance the development of male leads. Such lines of inquiry involve questioning whether females are portrayed as angelic, guiding figures or tempting eve figures instead of fully developed human beings with strengths, faults and their own significant storyline. An exploration of Chesterton’s fictional female characters complicates our understanding of his views on womanhood as held thus far.

Niloy N. Shah, Biology

James A. Marcum, mentor

Amending the Declining Patient-Physician Relationship Through Medical Education Reform: A Postulate for Aristotelian Virtue Pedagogy and Its Amicability with the U.S. Healthcare System

In a complex and technologically sophisticated healthcare system, the utilization of virtues which emphasizes the art of clinical practice is often eclipsed by the technical science of its practice. Consequently, the training of physicians generally focuses on the objective and quantifiable science of clinical practice, which at times cripples the patient-physician relationship. To counter this impact on the patient-physician relationship, medical educators must develop and utilize pedagogical strategies to teach virtues to medical students and residents. In doing so, a character-based virtue theory, proposed by Aristotle, can be used to highlight intrinsic mechanisms, namely *phronesis* and *prohairesis*, that lead to virtuous, continent, incontinent, or vicious character-based action. Further, a pedagogy, derived from a holistic understanding of Aristotle’s works, focusing on effective means of situational discernment, character-habitation, and reflective systems-II evaluation of action, can serve the physician well in

properly addressing the deepest convictions of the patient and fulfilling their expectations and desires for healthcare. In hopes of then maintaining and promoting virtuous action, federal and local medical infrastructure must publish quality-of-care analytics to both physicians and patients, thus imposing market virtues into a system of care through feedback loops. Hence, a call to virtue through education and infrastructural reform is necessary in the U.S. healthcare system, as it amends the patient-physician relationship and promotes the ends of medicine, through practical and humanistic means. For not to follow virtue is to give into vice.

Kelsey A. Shelton, International Studies

Lenore Wright, mentor

From the Personal to the Political: How the Perception of Women Affects Relations between the United States and Middle East

Conflict between the United States and the Middle East has been ongoing since the end of World War II. There are legitimate political grievances between the two regions, but a great deal of animosity can be attributed to cultural misunderstanding. As this is broad in scope, the thesis seeks to find a narrow entry way and does so through the perception of women. The thesis specifically looks at women's attire and what cultural assumptions are often drawn from it. It then expands to discuss the nature of feminism in both areas and find commonalities in the female experience in both regions. Ultimately, this thesis tries to create a more comprehensive understanding of both regions cultures to provide for a more tolerant populace and an opportunity for more constructive foreign relations.

Laryssa Shipley, Anthropology

Deirdre Fulton, mentor

Serpentine Images of Power: Benevolent and Malevolent Depictions of Snakes in the Minoan, Greek, and Roman World

The image of the snake evokes the same terror and awe today as it did in the ancient Mediterranean world. In the mythology, literature, and religious traditions of the Greek and Roman sphere, snakes were understood to exhibit benevolent and malevolent characteristics simultaneously: they symbolized the fertility of a mother goddess in the Roman cult of Isis, they were harbingers of prophetic doom in Virgil's tale of the destruction of Troy, they were healers in the Greek and Roman cult of Aesclepius, and envenomated travelers in Aesop's famous fables. Snakes also provided a link to the Underworld, and, by doing so, control the realms of life, death, and rebirth. Snakes guarded the omphalos, the "navel" or center of the world. Above all snakes embodied power because they were both commonplace and deified, as well as universally feared in the ancient Mediterranean world. By the time of the first century Roman writer Virgil, all of the aforementioned images of snakes were used to depict power, both benevolent and malevolent.

Jeremy Sieker, University Scholar

Matt Bradshaw, mentor

Longitudinal Trajectory Modeling of Alcohol Use Based on Early-Life, Time-Stable Covariates

Alcohol Use Disorders (AUDs) cause a great deal of damage to society through both health and social consequences. To work with, understand, and ultimately fight AUDs, it is necessary to come to a reasonable understanding of what factors cause or lead to AUDs across the whole life-course. The present study implements

the statistical technique of Trajectory (Latent Class/Profile) Analysis to examine the question of AUD etiology. With this methodology, AUDs are approached temporally not just as singular, finite outcomes, but as inherently different sets of paths by which individuals arrive at their addicted or non-addicted states. Logistic Maximum Likelihood Estimators applied in a person-centered variable approach allow grouping of individuals into trajectory groups. The model of best fit divides the population into six trajectory groups of alcohol use—high-constant, increasing, early peak, late peak, decreasing, and low-constant usage patterns. Logit relative risk ratios are evaluated to analyze which specific early life factors seem to have an influence not just on distal AUD outcomes, but also on the probabilities of trajectory group membership. Specific factors from variables related to parental SES, quality/nature of familial interactions, family structure, social support networks, academics and school performance, stressful life events, early life health, and psychological health were all evaluated in regards to probability of membership in high-risk trajectory group.

Alena Sigman, Biology

Bill Neilson, mentor

A Public Health Proposal to Improve Management of Childhood Asthma

Asthma, the most common chronic disease in children, affects 12.7% of individuals under eighteen in the United States. Asthma causes airway constriction when certain triggers, such as mold or cat dander, are encountered. No cure exists for asthma, but proper management can significantly improve the quality of life of an affected individual. Unfortunately, it can be difficult for low-income individuals to maintain proper asthma care. This thesis examines potential methods for identifying children who might be struggling to manage asthma as well as interventions that have been attempted to improve asthma care in children. Chapter Four analyzes these interventions and proposes a comprehensive plan for improving asthma care, especially for children in low-income situations. This plan would engage school nurses, healthcare providers, and community health workers to ensure that children are receiving proper asthma care. Emergency departments and accountable care organizations might fund this plan because of its potential long-term financial benefit.

Kelsey Silvester, Neuroscience

Jim Patton, mentor

Trauma types and their effect on PTSD

Trauma is a common stressor that many people have experienced or will experience at some point in their lifetime. For some, this trauma will lead to persistent, chronic stress and life-altering symptoms that are associated with posttraumatic stress disorder (PTSD). PTSD affects a person's life in many ways including both social and psychological aspects. It is a trying disorder that many individuals struggle with on a daily basis. The current treatment for PTSD is comprised of medication and/or therapy, however, PTSD has been shown to be somewhat resilient to these treatments which makes finding an efficacious regimen and helping individuals cope with their symptoms rather difficult. Several different types of trauma can lead to the development of PTSD. This review will focus on trauma from war and combat exposure, sexual assault, severe motor vehicle accidents, and natural disasters. Because the numerous forms of trauma are so diverse, severity of symptoms and response to treatment might differ among individuals suffering from PTSD. The brutality of the trauma as well as the number of traumatic incidences experienced is also expected to influence a person's symptoms. Ultimately, the differences in PTSD resulting from various traumas could require further development and customization of treatment in order to enable individuals to achieve the best outcome.

Haley Alise Stepp, Biology

Elise Edwards, mentor

The Impact of Patriarchal Interpretations of Religion on the Creation of Oppressive Cultures of Female Purity and the Contribution to Rape Culture

Patriarchal interpretations of religions have given rise to purity cultures which are selectively oppressive, dangerous, and sexually restrictive to women. Furthermore, patriarchal versions of religions have led to the development of pervasive rape cultures, beliefs that normalize sexual violence and shame the victims. By studying Christian and Islamic scriptures, theological doctrines, and traditional practices concerning women and sex, this thesis will demonstrate how these religions have been utilized in sexually oppressive societies. The societal attitudes and practices derived from oppressive religious stances are harmful to women, both socially and physically, by subjugation and rape. Before the horrors of purity and rape cultures can be fought, the culpability of religions and their patriarchal interpretations must be understood.

Nadine Stone, University Scholar

Eileen Bentsen and Ellen Filgo, mentors

Censorship and Freedom in American Libraries during the World Wars

In the First World War, almost all American libraries embraced censorship in the name of patriotism and paternalism. By the time America entered the Second World War, however, librarians had, for the most part, notably transformed their stances and affirmed the importance of the public's right to read. This thesis is an examination of the two wars and their accompanying debates on censorship, as well as the years in between that led to such incredible changes. This thesis also includes a case study on the public library in Portland, Oregon, using primary sources to track how national debates and trends affected a single location during these tumultuous years.

William John Stover, University Scholar

Kenneth R. Jones, mentor

Rome: Reverence and Resentment in the East

The years between 229 BC and 146 BC saw a massive transformation of the relationship between Rome and her Greek neighbors. From antiquarian curiosity concerning Roman origins, to hopeful approval and bitter opposition, the catalog of Greek attitudes toward Romans is lengthy. This thesis shall investigate the ways in which Greeks dealt with Romans in political interactions and portrayed them in literature from the time of their first appearance up to the loss of Greek political autonomy. Beginning with the earliest Greek discussions of Rome's Trojan or Greek ancestry and moving through the subsequent military and political history of Rome's involvement in Greece, I will elucidate the Greek views which underlie their policies toward the Romans, and trace the development of those views through the course of their exchanges.

Susan Stradley, Environmental Studies

Julie King, mentor

The Legal History and Evolution of the Clean Water Rule: Definition of "Waters of the United States"

Since the enactment of the Clean Water Act in 1972, much has changed in both legal precedent and scientific knowledge concerning the ways administrative agencies, such as the Environmental Protection Agency and the Army Corps of Engineers, regulate and protect waters in the United States. The Clean Water Act gives these agencies the authority to regulate the "waters of the United States", but there is much debate over what this terminology truly means. Since the 1970s, three landmark cases have altered the legal definition of "waters of the United States" - *United States v. Riverside Bayview Homes, Inc.*, *Rapanos v. United States*, and *Sackett v. Environmental Protection Agency*. These decisions brought about the need for the Clean Water Rule: Definition of "Waters of the United States" in order to clarify the scope of agency jurisdiction over the country's waters. This rule, promulgated in 2015, is the culmination of over four decades of legislation, landmark legal decisions, and agency actions that have changed the landscape of environmental regulations in the United States, and seeks to better protect the biological, physical, and chemical integrity of our nation's waters.

Dillon Stull, University Scholar

William G. Hoy, mentor

Gathered Storytelling: Death, Disease, and Healing Among the Christian Luo of Western, Rural Kenya

Humans' particular experiences of sickness and death depend largely upon their respective cultural and religious beliefs. They also depend greatly upon the social practices of their community, which define expectations for how members of society are to respond when people are sick, dying, and dead. This grounded theory ethnography drew data from sixteen home-based interviews and examined the experiences of sickness and death as recounted by members of the Luo tribe from a rural community on the Nyakach Plateau in western Kenya. The study identified and described Luo responses to sickness and death and demonstrated that members of this community tend to face sickness and death not as individuals, but as a community. The Luo communal response to suffering is rooted in the Luo practice of gathering to tell stories. The content of shared stories, which are often spiritual at the core, are important in providing a common basis from which tribespeople communally identify and respond to each other's health needs. Furthermore, the physical act of coming together for storytelling reflects the way in which the community likewise comes together in material, spiritual, and emotional solidarity in order to confront sickness, death, and other hardships as a united body of people.

Madeleine Sullivan, University Scholar

Todd Buras, mentor

Horrific Beauty

The world is full of really horrible evils. Horrific human suffering, meaningless animal deaths, and natural systems based on destruction work together to threaten our sense of meaning in the world as well as our ability to give the world perhaps any positive evaluation. This inability to claim that the world is good forms the basis for the philosophical discussion of the problem of evil: if the world cannot be positively evaluated how can we affirm the existence of God, or at least of that being which we feel deserves the title, one all-knowing, all-powerful, and all-good and loving. While this conversation has often been concerned with positive moral evaluation, the question of whether we can evaluate the world as aesthetically positive is rarely addressed. In this paper I will argue that, while we may not be able to call the world beautiful (by modern usage of the term) we can call it sublime. By expanding our vocabulary to include this word, we can more appropriately address the condition of the world while maintaining positive value.

Trent Sutton, University Scholar

Gaynor Yancey, mentor

A Qualitative Study of Collective Impact: Understanding the Need for Community Engagement

Using a qualitative study comprised of five in-depth interviews, this thesis considers the method of collaborative community change known as collective impact, specifically in regards to community engagement. The study targeted five key leaders involved in a collective impact initiative in a midsize Southern community and used the interviews to discover key information about the process of collective impact and particularly the process of community engagement within collective impact, a topic which has largely been neglected within the current body of research. This paper will first place collective impact within the context of the current literature on the subject, and then provide the study's methodology, state the results of the study which manifested in ten emerging themes from the conducted interviews, and finally discuss these results and the implications which they hold for professional practice.

Mikaela Sweet, Psychology

Christine Limbers, mentor

The Relationship between Executive Functions and Physical Activity in University Students

Obesity is a major health concern in the United States. Regular participation in physical activity is associated with lower rates of obesity and co-morbid health concerns. While a number of studies have demonstrated a link between participation in physical activity and executive functions (e.g., working memory, inhibition, problem-solving, initiation skills), the majority of these studies have used performance-based measures of executive functioning. Performance-based measures are highly structured and may not capture an individual's capacity to use these skills in daily functioning. The purpose of the present study was to assess the association between a behavioral rating scale of inhibition and initiation and physical activity in a sample of university students. It was hypothesized that better initiation skills would be associated with higher rates of physical activity. The multiple linear regression analysis revealed that initiation was a significant predictor of physical activity behaviors. These results demonstrate the importance of analyzing individual executive functions for their unique role in predicting physical activity behaviors.

Elijah S. Tanner, University Scholar

Scott H. Moore, mentor

Phronesis: The Missing Virtue

My thesis examines the intellectual virtue of *phronesis*, as understood through Aristotle's *Nicomachean Ethics* and Joseph Dunne's addition to Aristotle in *Back to the Rough Ground*. The thesis highlights the importance of the virtue by contrasting it to the other intellectual virtue of *techne*, and using three novels to provide practical examples of the virtue. The three novels, *The Good Apprentice*, *The Brothers Karamazov*, and *That Hideous Strength*, provide specific insight into the nature of the interaction between *techne* and *phronesis*, which highlight the impact of overemphasizing *techne* at the expense of *phronesis*.

Katie Traino, Psychology

Sara Dolan, mentor

Relationship Between Cognitive Functioning and Activities of Daily Living in Homeless Adults

It has been established that a homeless population demonstrates impairment in various areas of executive functioning, such as decision making, memory, and verbal fluency (Davidson, Chrosniak, Wanschura, & Flinn, 2014). However, research into other subcomponents of executive cognition must continue to enumerate the details of functioning in this population. In populations with related cognitive impairment such as Parkinson's disease and dementia, it has been established that deficits on high demand cognitive tasks predict impairment on activities of daily living (ADLs) (Reppermund, 2011). Such activities include financial management, home care, hygiene, transportation, and medication management. The importance of the relationship between cognitive functioning and ADLs in a homeless population has implications for possible intervention strategies. Should cognitive impairments be addressed, independent living conditions could be improved long-term. The present study examined the relationship between measures of neuropsychological cognitive functioning and instrumental activities of daily living (IADLs) in homeless adults. The proposed hypothesis stated that impairment in executive function domains would be correlated with IADL impairment. A sample of 44 participants was recruited from Mission Waco and examined at the Meyer Center. Results did not support the proposed hypothesis. There were no correlations between any of the tested cognitive domains and the IADL measure. It is hypothesized that the IADL measure was not sensitive enough for this population. Examinations of correlations between the tested domains found predicted intercorrelations within and between measures, particularly between intelligence and memory as well as intelligence and inhibition-switching. These intercorrelations support previous research. Further research should implement more sensitive IADL measures.

Bradley Varnell, University Scholar

Natalie Carnes, mentor

It is Good: A Theology of Celibacy

Christians today, it seems, have simply forgotten the logic and theology that for centuries underpinned much Christian celibate practice, rendering the celibate life difficult if not impossible to account for. This forgetfulness has coincided with the church's greater acquiescence to cultural shifts such that marriage and sexual life has come to take on the kind of importance in the ecclesial community that it has in the larger civil community. This thesis arises in response to this situation and attempts to offer to the church a robust, theologically grounded account of celibacy that will aid it in accounting for non-married Christians and in thinking rightly about Christian sexual life. The underlying assumption of this work is that without a thick account of celibacy, the church cannot think rightly about marriage and sexual life. To accomplish this work I first turn to the Christian past and the unique context in which early Christians developed their theologies and practices of celibate life. This context provides an analogy to our own day, discussed in chapter two, where marriage, family, and sexual life have once again become paramount. Following this analysis and account chapter three attempts a constructive work of describing a celibacy that speaks into the current climate in which the church finds itself. Finally, I conclude the thesis with reflections on the possible implications of celibacy on debates regarding marriage and sexual life in the church today.

Ashley Wallace, Chemistry

Sung Joon Kim, mentor

Characterization of Cell Wall Peptidoglycan in Enterococcus faecalis Biofilm Using Stable Isotope Labeling by Amino Acids in Cell Culture

The formation of bacterial biofilms is a significant concern in healthcare settings. In an effort to expand the current body of knowledge about biofilm and provide information useful for clinical treatment, this study aims to characterize the chemical composition of the cell wall peptidoglycan of *Enterococcus faecalis* by liquid chromatography-mass spectrometry (LC-MS). Using Stable Isotope Labeling by Amino Acids in Cell Culture (SILAC), the relative abundance of common cell wall modifications was compared for biofilm and planktonic bacteria. The biofilm phase was found to exhibit decreased O-acetylation, increased N-deacetylation, increased crosslinking, increased carboxypeptidase activity, and increased crosslinker biosynthesis. These findings are consistent with the lower metabolic activity of bacteria in the biofilm phase and the adhesion of biofilm cells to one another and to the hydrophilic components of the biofilm matrix.

Sam Watson, University Scholar

Samuel Perry, mentor

Setting the Scene in Environmental Fiction: Kenneth Burke and the Frontier Myth

It is difficult to ignore the environmental problems facing the world as a whole. Humanity has always produced stories in response to cultural movements and global problems. Recent pieces of environmental media can give insight into how Americans see their environment, the issues facing it, and potential paths forward. I examine James Cameron's *Avatar*, Frank Herbert's *Dune*, and Bethesda Softworks' *Elder Scrolls V: Skyrim* and apply Kenneth Burke's dramatic pentad to the iterations of the frontier thesis found in the three media. I focus on the protagonists present in each work, determining how they are placed within the Burkean "scene" and concluding whether or not each protagonist is "successful" as an environmental hero. Frederick Jackson Turner's frontier thesis appeared prominently in each media, showing that the science fiction/fantasy genres have difficulty moving away from the rhetorical frontier. However, *Skyrim* showed that the frontier can be subverted and altered from its usual iteration to one more inclusive of women and minorities because of the player's immersion in the game.

Justin Weatherwax, University Scholar

Susan Bratton, mentor

The Environmental Impacts and Social Trends of the Recreational Fishing of Sharks on the Texas Coast of the Gulf of Mexico

Sharks have begun to decline at a rate far faster than is ecologically sustainable. Sharks are not adapted to heavy predation, with low fecundity, slow growth rates, and many years before reaching sexual maturity. Many shark populations increase at the 1 to 2 percent rate per year and are being decimated by the far higher rate of decline caused by fishing industries. In some cases, recreational fishing may be as large or even larger a contributor to elasmobranch decline than commercial fisheries. A primary goal of this study is to ascertain the impact of recreational fishing on sharks along the Texas Coast while also gathering social data on the treatment and perception of sharks by the fishermen handling them. Notably, the size of the sharks caught and the age of the fishermen may have significant impacts on the conditions of the sharks being caught during recreational fishing in the Gulf.

Kathleen Winters, Neuroscience

N. Bradley Keele, mentor

Understanding the Effects of Stress on the Brain

While stress is a common experience for most people, high levels of stress can be dangerous to both physical and mental health. Chronic stress is implicated in a variety of psychological disorders such as generalized anxiety disorder, depression, and post-traumatic stress disorder, all of which contribute to lower quality of life and a substantial economic burden. The body's stress response is mediated by the hypothalamic-pituitary-adrenal (HPA) axis, which involves a cascade of signaling molecules such as corticotropin releasing hormone (CRH) and cortisol. Chronic dysfunction of the HPA axis alters brain structure and function, through the cellular effects of CRH and cortisol. For example, exposure to chronic stress may result in cognitive deficits such as impaired decision making and memory, and emotional deficits such as heightened fear/anxiety and depressed mood. While we are beginning to develop specific treatments for stress-related disorders, current treatments still lack efficacy. Therefore, further research is needed to understand better the root of stress-related disorders and improve treatment outcomes.

Madison Young, Business Fellows and Economics

Andrew Hogue, mentor

Studying Philanthropy to Further the Public Good in Waco, Texas

In attempts to 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 service, but neglect to invest deeply into society. In the city of Waco, 30.6% of the population lives below the poverty level, which is the second highest rate in Texas. Philanthropy is one potential means to transform conditions of poverty, but permanent impact relies on philanthropic education. Last year, I participated in Baylor's Philanthropy and the Public Good course. In a group of thirty students, I functioned as part of a foundation board and research team, and served as a grant writer, working with seventy-five nonprofits. While learning about strategic giving, we donated eight grants, totaling to \$100,000. Through the experience, I discovered that strategic giving is connected to collaboration and philanthropic education. This thesis explores the definition of philanthropy, outlines the process of the philanthropy course, explains my experience of grant giving, and argues the significance of collaboration and philanthropic education for students as a means to improve Waco.

Sarah Yuen, University Scholar

Tamarah Adair, mentor

Determining the correlation between agr polymorphisms and S. aureus sensitivity to blue light inactivation

Staphylococcus aureus is a Gram-positive pathogen responsible for minor skin infections, deep tissue infections, and even death. Antibiotic resistance of strains such as Methicillin-Resistant *Staphylococcus aureus* (MRSA) leads to an increased difficulty in treating "staph" infections caused by this bacterium. Due to the increasing resistance of staph strains to antibiotics, it is important to investigate and develop alternative modes of treatment for bacterial infections. Photodynamic therapy using 470 nm blue light has been identified as a viable alternative to antibiotic treatment, however significant differences in the sensitivity of strains to blue light have been found. This project investigated the role of a genetic component, the Accessory Gene Regulator (agr), found to be down-

regulated in *S. aureus* isolates exposed to blue light. A statistically significant difference was found between the response of isolates of *S. aureus* strains in *agr* groups 2 and 3, indicating that there exists a genetic basis for the varying responses of isolates to blue light therapy. However, further studies must be conducted to further elucidate the role of *agr* in the response to photodynamic therapy.

Emily Zakhary, University Scholar

Victor Hinojosa, mentor

The Parable of Holistic Healing

The understanding of the seemingly simple word, “health” has been largely misconstrued within society. Ideally health would be “holistic” and many health care professionals and patients desire to give and receive respectively holistic care, the fruition of those desires is largely lacking. The parable of the Good Samaritan provides a Scriptural demonstration of what holistic health should entail. I reflect on how physical therapy does an exceptional job of providing holistic care due to the establishment of a patient-therapist relationship from which aspects of wholeness are achieved. However, no health care field is flawless in providing holistic care, so practical improvements are suggested regarding how therapy and health-related fields can better provide for the needs of the people they are treating, not simply the physiological symptoms and problems with the patient.

Carina Gabrielle Zuniga, English

Sarah Walden, mentor

Jewish American Women's Autobiography: Mary Antin to Golda Meir

In the twentieth century, the United States experienced vast changes such as large scale immigration, world wars, and civil rights movements. The effects of these changes on minorities, women, and especially individuals to which both descriptors apply have often gone unnoticed. Many Jewish American women, who fit this description, turned to autobiography to record their experiences. Using a literary approach, this work addresses three Jewish American women writers and the plights and feats in their autobiographies. Mary Antin, an immigrant and pioneer for this canon, confronts difficulties such as intolerance and assimilation. Gertrude Stein, a prominent avant gardist, addresses the inescapable impact war can have on an individual. Golda Meir, former Israeli prime minister and activist, challenges a woman’s role and the political status quo. For a canon noted for its diversity, each woman records remarkably similar struggles across decades of change.