
**ABSTRACTS OF THESIS PROJECTS
SPRING 2022**

Honors Program & University Scholars



Baylor University
¹
HONORS COLLEGE

ABSTRACTS OF THESIS PROJECTS SPRING 2022

Teniade S. Adetona, Neuroscience

Jonathan P. Miles, mentor

Beyond the Cradle: Mechanisms and Applications Towards the Colonization of Intragalactic Exoplanets

Since the dawn of humankind, people have looked to the sky, wondering what lies beyond the blue expanse. As our technology continues to evolve, the prospects of potentially colonizing an exoplanet become astronomically greater, with humankind's curiosity already dabbling in the idea of commercializing space travel and colonizing neighboring planet Mars. This type of science leaves one to wonder; what if the human body could adapt to the environmental conditions of extraterrestrial planets without the need for equipment? What would it take to be capable of living a life similar to that lived on Earth but in outer space? This thesis aims to theorize what that kind of life could look like by examining the technique of bioforming the human body through directed evolution and the terraforming a planet would need to endure in order to support a functioning ecosystem and human life.

Nick Izmir Ahmed, Psychology

Stacy Ryan-Pettes, mentor

If You Build It, Will They Come? Associations Among Willingness to Use Social Media and mHealth Apps for Substance Use Treatment in an Adolescent Sample

The ubiquitous use of smartphones and social media by adolescents makes mHealth an accessible platform for substance use treatment. In fact, there is growing research examining the use of digital platforms for the delivery of substance use treatment and intervention for adolescents. However, there is limited knowledge about individual differences that are associated with willingness to use digital treatment programs. The goal of this study was to examine whether barriers to outpatient treatment and the severity of substance use are related to youth's willingness to use smartphone and other digitally-based interventions. The study provided a survey of smartphone use and digital intervention acceptability, barriers to treatment, and severity of substance use to a sample (N= 57) of adolescents enrolled in outpatient substance use treatment. The results showed a significant positive correlation between barriers to outpatient substance use treatment and the severity of substance use ($r = .30, p = .024$). Also, adolescents with more severe symptoms of substance use were more likely to have used social media to post information about wanting to stop using substances ($t(54) = 2.33, p = .023$). However, results were not significant for relations between barriers to substance use and interest in receiving support via a smartphone or any digital platforms ($t(54) = .04, p = .97$). The results of this study suggest the severity of substance use may be an important individual difference factor that is associated with the willingness to use digitally-based interventions for substance use among adolescents.

Samuel D. Aker, Communication

Jacob S. Ford, mentor

Trust, Collaboration, and Effectiveness in Virtual Teams

The COVID-19 pandemic has accelerated the trend of organizations using virtual project teams to bring dispersed talent together, which has created unique challenges such as low group satisfaction and productivity (Kirkman et al., 2002). Using social information processing theory (Walther, 1992), this study investigates the impact that trust has on a virtual team's ability to collaborate by examining the concepts of swift trust (Meyerson et al., 1996) and transactive memory systems [TMSs] (Wegner, 1987). Data was collected from virtual groups participating in a group communication simulation at a mid-sized university. The results found that while swift trust was associated with perceived TMS strength, this effect was moderated by the cognition-based trust in the late stages of the group. Swift trust was also found to be unrelated to effectiveness in the early stages of a group. These results suggest that trust is a vital element in the development of virtual team member relationships and the group's ability to collaborate.

Juliana Askren, Mathematics

Devan Stahl, mentor

Analysis of Perceived Benefits and Potential Harms of Direct-to-Consumer Genetic Testing with Regard to Improving Regulation

Direct-to-Consumer (DTC) genetic testing has been historically underregulated. Since the development of DTC genetic testing in 2002, regulations have been slowly accumulating with the creation of legislation such as the Genetic Nondiscrimination Act of 2008 and the FDA's 2010 decision to deem DTC genetic tests as medical devices requiring FDA approval and regulation. There are still gaps left by current regulations that must be filled through improving upon current regulations and establishing new legislation. When considering the need for improved regulations, it is important to recognize the reason consumers pursue such testing. Understanding consumer motivations helps to create regulation that avoids impeding benefits received from testing and ensures consumer protection by mitigating potential harm and risks from DTC genetic testing. This thesis provides a history of DTC genetic testing and analyzes consumer motivations, risks, and benefits to be taken into consideration for future regulations.

Alexander Bailey, Finance

Xin Wang, mentor

Into the Middle Kingdom: A Case Study of Uniqlo's Success in China

Business in China has been a global topic of intrigue for many years, and still is to this day, especially as the country quickly reaches the position of "largest economy in the world". With opportunity on the horizon, the answer to the question of success as a foreign company in China remains ambiguous. The purpose of this case study is to investigate the reasoning behind the Japanese clothing brand, Uniqlo's, success in the Chinese market. This company currently holds the largest market share of any fast-fashion apparel brand in China and continues to grow in market share year after year. The case study aims to answer the question of what modern successful Chinese market penetration looks like for a foreign apparel brand, and may apply to other business types. The structure of this thesis is first reviewing the important histories needed to understand the challenges Uniqlo faces in the Chinese market, followed by an in-depth investigation of some of their most successful business strategies in China specifically. Upon further analysis, the case study shows a central aim toward the continuously rising middle class of China in many of the company's most successful strategies fulfilled in the country. We conclude that Uniqlo's success, not only in China but as a whole, is largely in part and correlative with the new social stratum of the growing middle class in China.

Parker Bassett, Biochemistry

Bryan Shaw, mentor

Tracking SOD1 protein heterodimerization processes through fluorescence aggregation assays

Copper-zinc superoxide dismutase (CuZnSOD) is an enzyme which is found throughout eukaryotic cells and in some areas of bacterial cells and is responsible for catalyzing the transformation of superoxides into hydrogen peroxide and dioxygen. Studies have found that inherited mutations in the gene encoding CuZnSOD, SOD1, are present in a portion of cases of amyotrophic lateral sclerosis (ALS), a neurodegenerative disease marked by motor neuron degeneration and cell death. Because of this, CuZnSOD is a well-studied protein, though much is still to be learned about the pathology of the disease and how SOD1 causes it. One such aspect of disease pathology that is yet to be explored fully is the role subunit exchange plays in protein aggregation. Many of familial ALS-causing mutations are autosomal dominant, meaning interactions between wild-type (WT) and mutant forms of SOD1 protein exist. Heterodimers, containing one WT subunit and one mutant subunit, have been observed in tissue samples of individuals affected by ALS, necessitating study of the process by which these heterodimers are formed. In order to study these properties of subunit exchange and heterodimerization, recent studies have used fluorescence aggregation assays in order to monitor formation of protein aggregates over time and study the types of conditions that result in heterodimerization of SOD1 protein. By tracking the kinetics of heterodimerization over time, much can be learned from the rate and products formed from this reaction. These fluorescence assays are a unique way of studying protein aggregation kinetics, and the findings indicate varying rates of aggregation according to certain mutations in SOD1. The findings from this set of research using aggregation assays serves as a launching point for understanding how the presence of both WT and mutant protein may affect or accelerate disease progression as a result of heterodimerization.

Daniel Beck, University Scholar

William Weaver, mentor

Education “For the Sake of All Time”: How Education is Formed by an Immortal Desire for the Good

The realm of liberal education has taken many of its cues from Plato’s writings. Plato’s Allegory of the Cave, for example, has shaped how educators think of education as a liberation from one’s bondage to ignorance and an ascent to that which is True. This thesis examines how the Platonic principles of liberal education and the immortal soul influence later views of the soul and the proper education thereof. In addition to Plato’s writings, this thesis examines the works of Saint Augustine and C. S. Lewis to see how the medieval and modern Christian philosophies have adapted Plato’s notion that the soul is immortal and therefore needs to be both cared for in this life and prepared for its continued existence after death. The Thesis begins by establishing an understanding of the philosophies of each of these authors regarding the immortality of the soul and the telos of humankind. After understanding that each author conceives of the human telos as an immortal desire to possess the Good, the thesis establishes that education is an act of the immortal soul. Lastly, this thesis will examine each author’s perspective on the afterlife and the need for education in preparation for the afterlife.

Rebecca J. Bila, University Scholar

Walter Matthews, mentor

The Common Thread of Vaccine Hesitancy and its Manifestations in Covid-19

In an “unprecedented” world, vaccine hesitancy is a supremely *precedented* phenomenon. For this thesis, Baylor University students were surveyed regarding their opinions and behaviors with respect to Covid-19 vaccination. While in a modern, contextually-anchored package, responses revealed themes common not only among each other but common since the first vaccine was invented in the early nineteenth century. In this study of historical vaccines and their echoes in modernity, it is apparent that many of the objections cited against vaccination today are indicative of a repetitive history. As it stands, vaccination is one of the most, if not *the* most important

preventive measure against endemic and epidemic communicable disease, but an intensely diverse group of people decline to be vaccinated against Covid-19. Baylor students' opinions have proven both insightful and illuminating with regard to *why* exactly people decline Covid-19 vaccines, providing a launchpad for future research tailored toward addressing the specific concerns of a young-adult population well on their way to becoming the leaders of the future.

Allison Bolin, Health Science Studies

LesLee Funderburk, mentor

The effect of combined oral contraceptives in congruence with polycystic ovarian syndrome on female lipid profiles

Polycystic ovarian syndrome is the most common endocrine disease of women in reproductive age frames, affecting around 5-10% of premenopausal women. The utilization of combined oral contraceptives, containing both estrogen and progestin-like compounds, is the most common treatment of polycystic ovarian syndrome among these women. Polycystic ovarian syndrome symptoms tend to cause elevated levels of overall cholesterol, specifically low density lipoprotein while also increasing androgen secretion and circulation throughout the body. Conversely, combined oral contraceptives have effects of lowering androgen levels and decreasing overall cholesterol levels. The effects of combined oral contraceptives on lipid profiles in women with polycystic ovarian syndrome is newly studied due to the complexities of the interaction between pharmacological intervention and disease presentation. Due to the prevalence of polycystic ovarian syndrome and the use of combined oral contraceptives in premenopausal women, it is necessary to understand the relation between the two and the general effects on the body.

Annalise Bond, Communication Sciences and Disorders

Jason Whitt, mentor

A Survey of Biblical Sabbath Rest: Creation's Invitation to Communal Celebration

Amidst a culture that increasingly values consumerism, productivity, and individualism, communal practices of rest have largely been lost, specifically Sabbath-keeping. This thesis will argue the necessity of restoring the practice of biblical Sabbath rest while simultaneously diagnosing a prominent challenge to honoring Sabbath. The ancient vice *acedia*, characterized by states of extreme restlessness or weariness, directly opposes the practice of Sabbath rest. The writings of the monastic fathers Evagrius and Cassian will be examined in order to support this diagnosis of *acedia's* incompatibility with biblical Sabbath rest. Further, this thesis will offer a biblical understanding of Sabbath rest primarily through a comprehensive analysis of Sabbath within scriptural passages from both the Old and New Testaments. Looking to the life of Jesus and his healings performed on the Sabbath, this thesis intends to contrast the Pharisees' legalistic understanding of Sabbath with Jesus' ministry of healing and restoration. Building on this foundation, this thesis will trace significant implications of the Sabbath command, specifically the equality and dignity of humankind, rhythmic rest for all creation, and communal accountability in establishing practices of rest that do good to one's neighbor.

Ryan Both, University Scholar

Andrew Hogue, mentor

Ought We to Sell All We Have? Wealth, Poverty, and the Virtue of Living Simply

Christian thought has not always been situated in the context of the modern consumerist economy, but it has always found itself concerned with the proper treatment of wealth, that it might accord with—and dispose one to—charity. The intent of this paper is to understand some of the development of Christian thought on topics such as wealth, poverty, counsel, and command, to craft a theology of wealth consistent with the Patristic theology but

applicable to Christian living in the modern world. It begins with a discussion of Early Church texts on wealth and poverty. Through these writings, I seek to understand and articulate the extent to which Christ's words should be interpreted literally and to whom they are directed, as well as the effects of having wealth or embracing poverty. Then, I turn to St. Thomas' writings on poverty and liberality—the two key responses to Christ's counsel to the ruler—and two early Reformers' refutations of evangelical counsels and their benefits. Having considered these different theologies, I argue that looking to the example of ascetic Christians as they follow Christ, pursuing the virtue of liberality in one's spending, and living simply in response are the most practical things one can do in cultivating a disposition to love of God and neighbor.

Hanna G. Bradford, University Scholar

Jason Pitts, mentor

The Proposed Importance of Gustatory Receptors in Mating

Currently, mosquito-borne diseases are affecting billions of people worldwide and disproportionately burden the developing world. Despite control efforts, these diseases remain widespread. Studying chemosensation and mating behaviors in mosquito species allows for the development of novel control methods as well as understanding the population dynamics of cohabiting species. Our research hypothesizes that wild *Aedes albopictus* and *Aedes aegypti* populations do not demonstrate satyrization potential. Additionally, we propose several gustatory receptor (GR) candidates crucial to mating behavior. To determine whether *Aedes albopictus* and *Aedes aegypti* would produce viable offspring, mating assays were performed. After four days, spermathecae from the female mosquitoes were dissected and stained using DAPI to detect the presence of sperm. Out of the 300 spermathecae sampled, there was no indication of sperm in the heterospecific assays. Furthermore, these findings suggest that wild *Aedes albopictus* and *Aedes aegypti* populations do not possess satyrization potential. qPCR data confirms the candidate GRs are being expressed in tarsi and labellum tissues. To determine candidate GRs in *Aedes albopictus*, the *Aedes albopictus* genome was compared to sequence data from *Drosophila melanogaster* chemosensory GRs. Similarities were found due to the species' evolutionary closeness. To further confirm the presence of said candidates, qPCR was performed on labellum and tarsi samples from *Aedes aegypti*. Finally, there is no evidence of satyrization in wild *Aedes albopictus* and *Aedes aegypti* populations, and GRs are hypothesized to be the mechanism of mate recognition between these two closely related species.

Taylor Burbank, University Scholar

Elissa Madden, mentor

An examination of the rates of antipsychotic medication prescription among foster youth in the United States: A systematic review

Federal and state initiatives to monitor appropriate prescribing of psychotropic medications to youth in the child welfare system have been implemented to varying degrees across the United States, yet antipsychotic prescribing trends remain a concern for foster youth. This systematic review explores the prevalence of antipsychotic use among foster youth in the U.S. by examining peer-reviewed studies (n=7) published between 2012 and 2018. Results demonstrate that antipsychotic use among foster youth generally plateaued around 2008 after a large increase in the early 2000s. Despite the plateau, indications of overuse and off-label prescribing, as well as findings that monitoring services are not being utilized by the majority, leave much room for concern for this vulnerable population. Future research should address ways to educate primary care physicians in the area of pediatric mental health, evaluate more recent Medicaid claims data regarding antipsychotics as they are released, and assess the long-term implications of off-label antipsychotic prescribing.

Beth Butler, University Scholar

Scott Moore, mentor

“Manning the walls, covered with dust, and sunburnt”: Stoicism in Western Movies

Movie critics and cultural commentators often describe Western movies and their heroes as stoic. In contemporary language, “stoic” is usually invoked as an adjective for describing people who do not reveal emotion. The stereotypical Western cowboy faces the danger, hardship, and constant uncertainty of his world without trepidation; the description seems apt. However, in ancient Greece and Rome, Stoicism represented a philosophical school of thought that taught its adherents to consider virtue as the only good, vice as the only bad, and everything else as indifferent conditions. In this thesis, I argue that the casual use of “stoic” to describe Westerns may say more than it knows. I identify two Stoic types within the Western genre: the Pop Stoic and the Dutiful Stoic. The Pop Stoics embody the contemporary use of “stoic” and include unflappable, emotionless cowboys. The Dutiful Stoics, however, resemble the tenets of Stoic philosophy in important ways. These characters are resolved to fulfill their duties toward intrinsically good things: friendship, community, and justice. This commitment to duty no matter the cost enables the Dutiful Stoics to maintain equanimity in all situations. I consider four Western characters to support my argument: Blondie from *The Good, the Bad, and the Ugly*, Ethan Edwards from *The Searchers*, John T. Chance from *Rio Bravo*, and Wyatt Earp from *My Darling Clementine*.

Mikayla M. Catazaro, Neuroscience

Sara L. Dolan, mentor

Pharmacological Interventions for Treating Cognitive and Behavioral Impairments Following Traumatic Brain Injury

Traumatic Brain Injuries (TBI) occur when a blow to the head results in the alteration of brain functioning. While many people with mild TBI are able to recover within a few weeks, symptoms and impairments can be long-term, lasting months to years, or be lifelong, and millions of individuals around the world live with a permanent TBI-related disability. Some of the more common persistent post concussive symptoms include headaches, depression, fatigue, impaired cognitive functioning, poor memory, attention/concentration difficulties, anxiety, aggression/irritability, difficulty regulating emotions, and sleep disturbances. This literature review examines recent research on various pharmacological treatment options that address the manifestation of TBI symptoms, with emphasis on addressing cognitive and behavioral deficits. Literature suggests that pharmaceutical options are the most widely available treatment for many TBI symptoms, but are often limited in their flexibility, indicating further investigation into a comprehensive treatment is necessary.

Will Chamblee, Journalism

Alec Tefertiller, mentor

The Effects of Social Media on Public Relations

Throughout its history, many things have sparked change in the public relations industry. The invention of the radio, television, and internet all had a profound impact on the public relations industry. Social media is next in that line of groundbreaking technology and perhaps the most influential. This thesis will provide a comprehensive review of how the effects social media has had on public relations and its practitioners. First, a brief review of public relations history will be given to provide the appropriate context for the main discussion of the thesis. Then, through applicable case studies, peer-reviewed literature, and analytics, modern public relations will be compared to the public relations industry before social media, and the distinct changes will be considered. These changes include an overall shift from a one-way style of communication to a two-way style of communication, new roles for practitioners, and an evolving relationship between practitioners and journalists, among many others. Finally, the thesis will conclude by discussing the future of public relations and how social media will continue to influence its development.

Jack Charles, Neuroscience

Dwayne D. Simmons, mentor

Dysfunction of Calcium Regulation Mediates Processes Involved in Age-Related Hearing Loss

Hearing loss is a complicated disability affecting a large portion of the public. Hearing loss can occur due to a variety of reasons, but the processes involved in such a phenomenon are considered to be similar across all types of hearing loss. Here, an oncomodulin knock-out (KO) mouse strain is used to resemble an age-related hearing loss model. Oncomodulin (OCM) is a calcium binding protein (CaBP) in mammalian outer hair cells (OHC) responsible for calcium regulation. OCM is the dominant CaBP and is the only known CaBP whose KO is known to cause progressive hearing loss. Thus, this study sought to examine changes in the OHC that occur in response to its deletion. Of interest were OHC survivability, secondary CaBP expression, efferent cluster expression, and prestin expression, all of which are proposed mechanisms involved in hearing loss. This study hypothesized that the calcium dysfunction resulting from Ocm KO leads to changes in these four areas, which contributes to eventual hearing loss. Upon analysis, it was found that OHC survivability and efferent cluster expression are mediated by calcium regulation, while secondary CaBPs and prestin expression are unaffected. These findings suggest that OHC presence and efferent connections are primarily involved in processes resulting in age-related hearing loss, and that these mechanisms are regulated by OCM function.

Bella (Clarise) Chavez, Film and Digital Media

James Kendrick, mentor

Who Do You Think Batman Is?: An Investigation of What Adaptation Has Done to the Dark Knight

Batman has been regurgitated through the public's consciousness in a way few characters ever have. This thesis investigates the adaptative nature of the Batman franchise. I argue that this adaptive nature has intrinsically changed the characters of Gotham due to the public's understanding of the characters being changed by their movie adaptations, Batman's character in a constant flux of being interpreted and those interpretations being cannibalized by wider audiences until the cycle begins again.

Grace Chen, University Scholar

Arna Hemenway, mentor

The Slow Burn that Lasts Forever: Bookbinding Transformative Fiction

Fan studies and transformative fiction studies are still relatively new areas of scholarship. Fan studies also lacks focus on transformative fiction ("fanfiction") of stories with transcultural roots, such as anime and manga fanfiction. Finally, although existing fan scholarship studies fanfiction from several perspectives—including areas such as English and communications, anthropology and ethnography, media, film, and television, psychology, and law (Hellekson and Busse)—there is focus on fanfiction's past and present, rather than its future. In this project, I write long-form fanfiction that transforms two anime and manga franchises (Haruichi Furudate's *Haikyuu!!* and Kyoto Animation's *Violet Evergarden*) and use the work as material to bind into a case-bound, hardcover book. In doing so, I argue for fanfiction's right to existence in a permanent, physical form, in opposition to its current, ephemeral existence online, thus preserving fanfiction's transcultural, queer feminist, and folkloric nature.

Layton Coker, University Scholar

Andrew Hogue, mentor

No Place to Lay His Head: An Analysis of Housing First and its Efficacy in Three American Cities

United States homelessness policy in the 21st century has almost exclusively adhered to "Housing First," a low-demand approach that prioritizes the provision of permanent housing for individuals experiencing homelessness, regardless of the individual's employment status, criminal history, or sobriety. The underlying assumption of

Housing First is that the above issues, and more, cannot be solved if an individual does not first have the basic need of housing met. However, the results have been drastically unequal; some American cities have seen a near elimination of homelessness, while other cities' homeless populations continue to grow. This thesis seeks to discover the sources of the disparities between successful and less successful implementations of Housing First policies by examining three American cities: Salt Lake City, Utah; San Francisco, California; and Waco, Texas. Through data-driven empirical research as well as personal interviews, I discover that the reasons for Housing First policy failures are manifold but, often, predictable. Ultimately, I conclude that the three greatest determining factors for Housing First success are a) charitable giving from nongovernmental entities, b) availability of affordable housing, and c) interagency communication and cooperation.

My-Ha Cook, Biology

Meredith Palm, mentor

The Opioid Crisis: Treatment Efficacy and Comparison to Canada

The opioid crisis refers to the significant number of deaths and overdoses in America over the last three decade due to the prescription and circulation of opioids. In my thesis, I will argue that the severity and longevity of the opioid crisis has been perpetuated by poor treatment availability and efficacy, especially among individuals of low socioeconomic status (SES), leading to a disparity in the socioeconomic status of affected America adults. I propose a new model of treatment by/after comparing American and Canadian treatments for individuals with opioid use disorder and low SES.

Anne-Douglas Cousar, Political Science

Matthew Andersson, mentor

The Depletion of DACA: How state-specific, layered policies have directed immigrant health in the past decade

This study explores how the implementation of Deferred Action for Childhood Arrivals (DACA) has impacted immigrant health over time given significant inconsistencies within the federal policy. It specifically examines the DACA recipient populations in Texas and California to identify how various inclusive and exclusive state policies align with federal DACA policy and contribute to overall health. It utilizes data made publicly available through each state's Health and Humans Services agencies, and it emphasizes the importance of state policy and social environment as main contributors to immigrant health while the future of federal DACA policy remains inconclusive.

Nolan Craft, Mathematics & Physics

Zhenrong Zhang, mentor

Polarization-Dependent Raman Spectroscopy of Anatase and Rutile TiO₂ Micro-crystals

Phase transition from anatase to rutile is critical in the photocatalysis of TiO₂. Few Raman studies have been done on the anatase micro-sized TiO₂ single crystals with a high percentage of the (001) reactive facet. Direct observation of phase transition from anatase to rutile would enable the synergistic effect between anatase and rutile in photocatalysis. Here, single micro-crystals were investigated by polarized Raman microscopy to understand the phase transition of anatase TiO₂, particularly the transformation of crystalline structure. The Raman mappings and spectral intensities of the micro-crystalline structures were compared with the spectral intensities of nature mineral single crystalline structures and those expected from analytical calculations. Raman spectra of from experimental polarized Raman methods showed that the A_{1g} and B_{1g} peak intensities of both rutile and anatase micro-crystals agrees with those of nature single crystal. Further, the Raman mappings showed that the ratio of the combined A_{1g} and B_{1g} peak intensity to the E_g peak intensity at facet boundaries is dependent upon polarization state. The difference in intensity at the edges was most likely the result of crystalline structure or facet boundaries, rather than stress or Raman geometry.

Michael Burke Craighead, University Scholar

Steve Block, mentor

The Jurisprudence of Justice Neil Gorsuch

Justice Neil Gorsuch is a self-proclaimed originalist and textualist. In many respects, however, Justice Gorsuch represents a new strand of textualism that does not fit nicely within traditional conservative or liberal labels. One has to look no further than *Bostock v. Clayton County* to see how Justice Gorsuch's textualism is distinct from other well-known textualists. An examination of Justice Gorsuch's own understanding of textualism, his approach to government structure and powers, his decisions involving rights and liberties, and his method of statutory interpretation reveals an emphasis on due process that is distinguishable from other Justices on the Court. Justice Gorsuch is unique in how he ties due process to the separation of powers and fair notice. The centrality of the separation of powers to due process is evident in Justice Gorsuch's emphasis on judicial independence, his fight against administrative deference, and his reinvigoration of the nondelegation doctrine. Likewise, he insists on fair notice through his distaste for judicial balancing tests, his requirement that Congress be explicit when it acts, and his rejection of judicial policymaking. These two concepts work together in Justice Gorsuch's jurisprudence to ensure that individual rights are protected and liberty is capable of being exercised. Ultimately, his jurisprudence understands the rule of law as anchored in a robust conception of due process through fair notice and the separation of powers, which makes him unique among the current members of the Court.

Jake Dickinson, Biochemistry

Christie M. Sayes, mentor

Comorbidities & Vaping

Modern diseases are very complex and can be made even more complex and dangerous when they occur simultaneously with another conditions. This co-occurrence of conditions in an individual, despite its commonality, does not have a uniform term to describe it; furthermore, the terms that do exist have many, often conflicting, definitions. In Chapter 1, a term was selected, and a broad general definition was laid out for that phenomenon. The term comorbidity was defined as the presence of multiple conditions or diseases occurring simultaneously in a single individual. Additionally, the common comorbidities of asthma with allergic rhinitis and lung cancer with chronic obstructive pulmonary disease (COPD) were discussed. Vaping is a crisis currently facing the United States. Unfortunately, current scientific knowledge of the effects of vaping is woefully incomplete. Included in this area of ignorance is the knowledge of the types of interactions that vaping can have with comorbid conditions or the effects of the individual components of e-cigarette fluid. To help make strides toward fixing these gaps in knowledge, Chapter 2 ran two experiments. The first experiment calculated the LC50 value of the e-cigarette flavoring cinnamaldehyde using two different viability assays: MTS and presto blue. This experiment served to show which assay should be used in further studies. The second experiment calculated the LC50 values of two common e-cigarette flavorings, cinnamaldehyde and myrcene. This enabled a comparison of the toxicity and served as a trial to show how future studies should be run. Chapter 3 serves as a guide for future work and offers an experimental design for future work which will both broaden and deepen the scope of the study.

Lilac Ding, University Scholar & Political Science

Christopher Pieper, mentor

A Holistic View of the Impact of Family Life on a Child's Education Outcomes

Though many studies have examined how different factors impact education outcomes, there is little research that focuses on self-perceptions from both students and parents. This thesis aims to identify the most influential factors for a child's academic success through interviews of both students and their parents. Not only does this study illuminate which factors students and parents value the most, but it also provides a holistic analysis by comparing responses within an individual family unit. Interview data is analyzed based on seventeen specific factors of analysis grouped by themes such as family involvement, socioeconomic status, religious background and cultural

background. Student and parent responses are analyzed separately and then compared, including student-parent pairs within the same family. The results indicate that the majority of students perceive parental involvement to be the most impactful for their academic success while parents attribute it to their child's intrinsic motivation. Further implications for these results are also discussed.

Ayla Dodson-Hestand, Political Science

Sam Perry, mentor

How White Evangelical Women Reshaped the GOP

The 2016 election is widely regarded as the most shocking presidential election in recent United States history with the election of Donald Trump. Even more puzzling than his election was the support with which white, evangelical women threw behind him, given his history of sexist rhetoric and his seemingly rocky relationship with religion. There has been limited research conducted on what garnered this support, and much has focused on single-issue voting. However, I'm not at all convinced that this support was the result of one issue but rather of years of political discontent and calculated political strategy. This thesis will examine the multi-dimensional campaign efforts of three women associated with the white evangelical movement to explain why his widespread support among this demographic should not have been surprising. Further, it will provide cultural and historical context which laid the groundwork for their efforts. This project has two goals. The first is to explain the ways in which white, evangelical women wielded their political power in 2016, which led to an unprecedented election. The second is to understand how these campaign tactics re-shaped the GOP and political discourse for subsequent presidential elections.

Daniel Dong, Biochemistry

Samuel Parler, mentor

The Universal Induction of Broad Emotions Through Music Reception

Different compositions of music instigate a variety of different feelings within audiences. These feelings are a component of emotion – a combination of physiological processes, behavioral responses, and feelings based on cognitive assessment in reaction to a particular situation and interpretation of one's bodily states. Even so, there exists objections regarding the possibility of music possessing the ability to evoke, let alone express emotions within listeners. While the theoretical support behind this side of the debate provides insight, the empirical evidence and experience of listeners advocates its opposing argument. In this review, the goal is to present these counterarguments and even go so far as to share compositions that have the innate ability to induce a particular emotion by reception. An understanding of objective emotions and the distinction between how one feels or perceives them will be necessary. A framework regarding the physiological and psychological mechanisms by which music may evoke emotions has been provided by music psychologists to construct a foundation for supporting research and review. Finally, a presentation of surveys and music-based experimentation will be outlined, and their corresponding results analyzed and discussed.

Rachel Donnelly, University Scholar

Dan Hanchey, mentor

A State of Eternal Rest: Cicero's Use of Otium in his Philosophical Dialogues

This thesis situates Cicero's discussion of *otium* in his *De Oratore* within the Roman virtue conversation. Cicero's presentation of *otium*, often translated as "leisure", offers the promise of nation state that thrives without being at war. Chapters One and Two show how Cicero situates his entire discussion of *otium* within memory, so that, like other standards of Roman virtue, conveyed through *exemplum*, the hope of *otium* will not fade in time. Chapters Three and Four compare Cicero's *otium exemplum* to other forms of exemplary discourse, suggesting that the nature of the dialogue genre provides a unique platform for such discussions.

Sydney Dukes, Communication Sciences and Disorders

Yang-Soo Yoon, mentor

Comparing Effects of Frequency Maps on Sentence Perception Between Simulated Bimodal and Electric Acoustic Stimulation Hearing

Speech understanding with a cochlear implant (CI) and hearing aid (HA) on either the opposite ear (i.e., bimodal) or the same ear (i.e., EAS) produces a considerable synergistic effect. While many bimodal and EAS users experience significant benefit, others gain little or no benefit or experience interference. One potential contributor to this variability is that the effect of different degrees of residual hearing thresholds in HA ears on the maps has not been seriously considered. Another challenging aspect of previous bimodal and EAS studies is the difficulty of precisely interpreting the results due to different testing, audiologic components, demographic variables, bandwidths, filtering cutoff frequencies, and slopes for either HA or CI ear. Each of these factors precludes controlled comparisons in real bimodal and EAS patients. Existing bimodal and electric acoustic stimulation (EAS) studies suggest highly mixed results regarding frequency fitting maps. This study evaluated various frequency maps on the benefit of bimodal and EAS hearing in sentence perception using acoustic simulation. Results indicated that the optimal map was similar across bimodal and EAS hearing configurations but was influenced by the upper-frequency bounds of residual hearing in the acoustic ear. Results also showed that bimodal and EAS benefit in sentence perception is also similar regardless of signal-to-noise ratio (SNR). In this study, using simulations of bimodal and EAS hearing with normal hearing (NH) listeners, we determined the optimal frequency maps, based on sentence perception scores by adjusting acoustic and electric boundary frequencies.

Katherine Eddins, Finance & Marketing

Lauren Farish, mentor

Financial Literacy Educational Programs: Purpose, Availability, and Necessity

This thesis conducts an analysis of the status of financial literacy programs that exist within the current educational system, specifically in the United States. By researching a variety of current financial literacy programs, teaching tactics, and statistics, an inconsistent system of educational implementation and a rapidly increasing knowledge gap between individuals was identified. Financial literacy proved to be a common factor between the increasing wealth gap and financial struggles that individuals are facing. Financial education is essential to achieving financial stability in life. Therefore, a proposal of specifically identified topics, methods, and overall improvements are provided to implement consistency and aim to equip students with the necessary knowledge to succeed financially.

Caelan Elliott, University Scholar & Great Texts

Kristi Humphreys, mentor

Not-So-Little Women: Evolving Currents of Feminist Thought in Film Adaptations of Little Women

The novel *Little Women* (1868) by Louisa May Alcott has spawned countless film and television adaptations, but none are more popular and beloved today than the 1994 film written by Robin Swicord and the 2019 film by Greta Gerwig, adaptations which shed light on the evolution of feminist thought over the past 150 years. After providing an overview of the waves of feminism, this paper compares the novel and both films in the following main areas: female education, ambition, and career, and female commitment to domesticity. *Little Women* (1994) reflects the more mild third-wave feminism of the 80s and 90s, while *Little Women* (2019) contains changes to plot and dialogue that portray the more extreme second-wave feminism, disregarding the postfeminist perspective that celebrates the fulfillment many women find in marriage, motherhood, and domestic work and the strength they display in these roles. I argue that Gerwig's access to Alcott's journals may have motivated her to more accurately represent the limitations of women during Alcott's time, but that Gerwig's disregard of other parts of the journals highlighting Alcott's appreciation for domesticity indicates that Gerwig was also creating a work that caters to a twenty-first century audience's desire for a more radical feminist activism.

Mason Embry, History

Daniel Watkins, mentor

Nineteenth and Twentieth Century Anarchism as Defined and Associated within the British Courts

The purpose of this thesis and my research is to further the historical understanding of how anarchism has been defined and categorized in the past. This thesis will specifically focus on how anarchism was defined within the English courts during the nineteenth and early twentieth centuries. This thesis centers around six court cases and their trial proceedings, found on the Old Bailey's database. Further evidence from British Library Newspapers is brought in to support my analysis of these cases, as well as secondary historical sources that provide necessary context to these cases. To begin my research, I first compiled a collection of histories that gave me an understanding of anarchist historiography, which is the subject of my opening thesis chapter. After doing this, I then turned to the proceedings of each of these court cases and analyzed those cases in order to understand how exactly anarchism is being defined within each case. These six cases are examined in the following two chapter from the historiography chapter, each chapter focusing on three cases. The analysis in these chapter will show that anarchism association was initially created by the government to secure conviction in the courts. Over time, the association was adapted to be used against foreigners. The last chapter is a concluding chapter that answers the question, "so what?" In my conclusion, I argue that these cases show that anarchism was defined and associated, in English courts during that time, with perceived political threats and foreigners, which is in alignment with a larger, global rise in xenophobia.

Rylee Ewert, University Scholar

Scott Moore, mentor

Rhetorical Manipulation in the Works of C.S. Lewis and J.R.R. Tolkien

Familiar with the verbal persuasion of leaders and dictators of the 20th century, C.S. Lewis and J.R.R Tolkien offer insight into the power of speeches, including those of malicious intent. Tolkien's *The Lord of the Rings*, along with Lewis's *The Screwtape Letters* and *That Hideous Strength* characterize evil speakers with similarities that my thesis explores. Using textual analysis and the insight of other scholars, I specifically address the shared goals of these rhetoricians, which arise in the speeches themselves or through their effects on other characters. This thesis suggests that Tolkien and Lewis's manipulative speakers share the same three-fold goal to distort people, to enslave them, and to isolate them from others. Through the scenes, these authors suggest the ways that such speakers target human inadequacies, and how one might respond to their words.

Jessica Fan, Biology & Music Performance

Tom McGrath, mentor

The Effect of Music on Biomolecule Production and Listening Satisfaction

Listening to music is enjoyable, but can it do more for the human body than satisfy the ears? This thesis examines the effects of music with a literature review through a biological lens, focusing on how listening to and producing music can affect levels of cortisol, beta-endorphin, oxytocin, and various components of the immune system, as well as what effects these species have on the body. Additionally, it includes a survey exploring how tuning frequency affects listening satisfaction and how one's area of study (specifically, science or music) may influence one's preference. Continued support for tuning to 432 Hz despite the current tuning standard of 440 Hz inspired this investigation into the physical qualities of music and its effects on the listener. The results of this survey were inconclusive, perhaps because the sample size was not large enough and the ratio of science to music majors was not representative.

Lauren Ferguson, University Scholar

JoAnn Tsang, mentor

A Web-Based Weight Prejudice Intervention Targeting Individuals with Body Image Issues and Disordered Eating

Disordered eating and body image issues may have consequences for how the individual views and treats others. Current theories on weight related prejudice hypothesize that internal stigma (a negative attitude toward oneself) may be projected as external prejudice (a negative attitude or discriminatory behaviors toward members of an out-group). As people with disordered eating and/or body image issues show high rates of internal stigma, they may be disposed to demonstrate high rates of external prejudice. Moreover, they may be less affected by an experimental manipulation that decreases antifat attitudes because internalized stigma and strong attitudes are more resistant to change. Participants (N=219) were randomly assigned to one of two conditions, a persuasion condition and a control condition. In the persuasion condition, subjects read a persuasive message concerning weight metabolism and genetics. In the control condition, subjects read about the role of psychological stress on mental illness. They then were presented with a series of scales to measure explicit and implicit weight-related prejudice and internalized weight stigma. Afterward, participants were asked to complete an assessment of disordered eating and body image issues. The results show correlations between internalized weight stigma, and explicit and implicit forms of weight prejudice. I discussed the limitations of a small sample size, resulting in an underpowered study. Further research is needed to determine if disordered eating and/or body image moderates the strength of weight prejudice interventions.

Lucy Fisher, Biology

Barry Harvey, mentor

Embracing Fraternity: Catholic Responses to COVID-19

The COVID-19 pandemic represents a continuation in the human history of disease. Furthermore, it also represents a continuation of Catholic care and response to disease. From the first century onward, Catholics, have been involved in caring for the sick and providing social support to effected communities. Over time, these practices have become entwined with the theology of Catholic Social Teaching, creating a framework for social outreach and community building. This thesis will detail Catholic responses to COVID on multiple levels (international to local) and compare these to disease response efforts from history in order to demonstrate that Catholic responses to COVID represent an evolution in Catholic care for the sick. This evolution has been shaped by social teaching as well as the guidance of the current pope and has many implications for the future of social support provided by the Church.

Alexandria M. Francis, Marketing & International Business

Jon Singletary, mentor

The Enneagram and Communication

This thesis seeks to find the relationship between the Enneagram and communication styles. Background data on the Enneagram and its triads was first presented to provide ample background knowledge on the material. Then, a case study was conducted of three individuals, a Type Nine, Type Six, and Type Three. Each individual had a similar background and profile. This case study was conducted by asking a series of questions, which pertained to the different communication preferences and styles of each respective individual. Once the data was collected, it was analyzed in the context of the qualities of each individual's Enneagram type and triad. Based on the research findings, there appears to be a strong connection between an individual's Enneagram type and their communication preferences and styles.

Ashlyn Freemyer, University Scholar

Scott Moore, mentor

The Consolation of Sorrow

What have the tragedies of antiquity to do with consolation? It seems that the Greek plays, which are marked by war and grief, have little to offer in terms of comfort. Yet, the characters of ancient drama are well-acquainted with sorrow, inviting audiences to share in their experiences of suffering and desire for consolation. In this thesis, I demonstrate how Greek tragedies provide a consolatory sorrow that relieves the afflicted and pulls them outside of themselves. I establish the ways in which consolation allows for sorrow, turning to both the philosophic and religious traditions. Both perspectives recognize the need to mourn and leave room for expressions of sadness. Greek tragedies prompt this consolatory sorrow by providing a platform for people to confront suffering and mortality through the safety of art. In depicting the serious nature of pain and grief, the dramas provide an outlet for sorrow, recognizing the need to mourn, and pushing audiences toward a consolation found in community and comforting other people.

Brittany Fryer, Nutrition Sciences

Stanley Wilfong, mentor

Food Insecurity: A Multifaceted Issue Requiring Diverse Solutions

This thesis explores the multifaceted nature of food insecurity in the general population and more specifically within college students. There are three goals: first, to provide background information on the history of food insecurity and what has been done to address it; second, to inform on the many negative effects food insecurity has on several health domains; lastly, to give insight into how food insecurity is caused and how to address food insecurity going forward. By doing so, this thesis argues that the intersectionality of causes of food insecurity requires diverse solutions including, but not limited to, expanding food assistance programs benefits and integrating programs to reach more people. I accomplish these goals through four chapters. The first chapter provides an overview of the history of food insecurity and the policies and programs enacted in the United States since the 1920s. The second chapter describes how food insecurity impacts the physical, mental, and social health domains and examines how college students have a unique experience within these dimensions of health. The last goal is accomplished through the third and fourth chapters where the third chapter analyzes the causes and determinants of food insecurity and the fourth chapter addresses solutions to food insecurity.

Allison Fudge, University Scholar

Nicole McAninch, mentor

Community Contributions to Academic Success in Residential Communities

There are many initiatives implemented by institutions of higher education to promote the academic success of their students. Utilizing the community within the residence halls is a way to connect university resources to students and create a support system that carries one through the rigor of collegiate courses. The goal of this project was to establish the importance of community in developing successful students and how it promotes academic thriving. The conducted analysis was parameterized by the circumplex family model. After the analysis, I proposed a universal plan to implement within the hall to achieve a community that is most likely to promote academic success by focusing on academic endeavors and a supportive community. Although the generic plan could be met with limitations, the incorporation of this plan promotes academic success for the students in the community.

Mackenzie Gamel, University Scholar

Jeffrey Fish, mentor

Pagan Elements in the Afterlife Depictions of Early Christian Martyrdom Accounts

This thesis is an exploration of the pagan influences on early Christianity and its depictions of the afterlife, as seen through popular martyrdom accounts. The first chapter situates early Christianity in its context of Greece and the Roman empire. Chapter two explores two significant examples of pagan eschatology through the Orphic gold leaves and Book six of Virgil's Aeneid. Chapter three explores The Martyrdom of Saint Polycarp and compares its eschatology to that of contemporary pagans. Chapter four explores the four eschatological visions in The Martyrdom of Saints Perpetua and Felicitas and compares them to the depictions of the pagan afterlife explored in chapter two. These comparisons are done through a combination of scholarly research and literary analysis. This thesis makes no attempt to argue a pagan origin for Christian doctrines but seeks to explore the eschatological beliefs shared by contemporary religions.

Greta Gessert, University Scholar

Arna Hemenway, mentor

Letters to Each Other: A Short Story Collection

This short story collection explores how elements of nonfiction can be tied into fiction through the incorporation of psychology research. Each of the eight stories incorporates psychology research as a driver of plot and/or character decisions and thought processes, thus adding a scientific element to each piece. In some ways, both psychology research and fiction seek to increase understanding of the human mind, so this project seeks to marry those two pursuits. Additionally, the stories are an attempt to explore various human relationships, so they each take the form of a letter. The "writer" of one letter is the "recipient" of the next (Anne writes to Brady, then Brady writes to Clark, then Clark writes to Dani, etc.), highlighting interconnectedness and playing on how people are all related to one another.

Grace Gilmour, University Scholar

Kristen Pond, mentor

The Incandescent Mind: A Study of Light in the Works of Charles Dickens & Virginia Woolf

From antiquity up until the twenty-first century, light has served as a symbol to convey a wide variety of abstract themes, which often hold a morally positive connotation. The morally positive association of light is evidenced as early as Genesis. In Genesis 1, God declares, "Let there be light," and when "God saw that the light was good... [He] separated the light from the darkness." By the mid-nineteenth and early twentieth century, light no longer held such a strong association with pure divinity or God Himself. The growing industrialization in England created a world in which artificial light grew increasingly prevalent in daily life. Charles Dickens and Virginia Woolf react to this industrialization by depicting light in their works. By investigating the use of light by Charles Dickens in *Hard Times* and *David Copperfield* and by Virginia Woolf in *A Room of One's Own* and *To the Lighthouse*, it becomes clear that light is used to illustrate the cultivation of the emotional capacities, such as wonder and compassion, as well as the cultivation of Woolf's androgynous, disinterested, and incandescent mind.

Rekha Goswami, University Scholar

Shelby Garner, mentor

The Usability of an mHealth Application in India for Type 2 Diabetes Mellitus

Mobile health technologies (mHealth) are a rapidly evolving field in India and globally and are increasingly being used to address noncommunicable diseases, such as Type 2 Diabetes Mellitus (T2DM). However, few studies have addressed user perceptions of T2DM mHealth applications (apps) in India. The purpose of this study was to determine the usability and compare results of an mHealth app designed to improve T2DM health literacy among subpopulations in India. The mHealth App Usability Questionnaire (MAUQ) was used to research the usability of the T2DM mHealth app in India. Participants (N=95) were recruited via email and WhatsApp. They were first asked to use the mHealth app and then complete the usability questionnaire. Participants of the study were mainly single (86.3%) females (95.8%), ages 18-28 (89.5%) with some college degree (63.8%). The participant population was mostly unemployed (90.5%), lived in an urban area (76.8%), and were not previously diagnosed with T2DM (93.6%). Overall, users agreed with many of the questions and found the mHealth app easy to use (mean= 6.03; SD=1.54) on a scale of 1-7. Results showed that there was no significant difference in scores between age, gender, marital status, employment, or previous diagnosis rates and responses to the questions. As a result of these findings, we can use the same interface and layout of the mHealth app with more confidence when creating other health education apps. This data has shown places of improvement for future apps, such as adding more information, additional questions, and more language options. With this data, we can create health literacy apps that are best suited for the user and easy to use.

Austin Gould, University Scholar

Luke Ferretter, mentor

Redemption in Cormac McCarthy's Border Trilogy

In Cormac McCarthy's border trilogy, redemption is a central theme. The protagonists of the trilogy go through a perilous journey of moral exploration in which they are exposed to and carry out acts of evil. This darkness affects them, but their responses to it redeem their actions. The redemption which is found in the border trilogy parallels the biblical redemption found in both the Old and the New Testaments. By examining the Greek and Hebrew language in scripture concerned with redemption, it can be proven that McCarthy is discussing central Christian themes through his use of redemption in the border trilogy.

Clara Grimsley,

Anne-Marie Schultz, mentor

The Future of Healthcare in the United States: How an Integrative Medical Approach using Yoga as a Complementary Medicine in Addition to Conventional Medical Practices Can Revolutionize Hypertension Treatments

Conventional, complementary and alternative, and integrative medicines all capitalize on different aspects in treating their patients. While each has their own benefits, integrative medicine is the only one to place the patient in charge of deciding their treatment plan and the only one to combine different elements of the others into patient care. Because of this, integrative medicine blends well with yoga, which is a practice that is innately open to anything that may benefit the practitioner's body, mind, and spirit, which often is not only doing traditional yogic exercises, but also sometimes seeking out conventional medical care. Hypertension, or high blood pressure, is a multifaceted condition that is characterized by having a blood pressure at or above 130/80 mmHg (CDC, 2020). Due to its complexity, hypertension is difficult to treat with the unidirectional treatment plans provided by conventional medicine. However, an integrative medical approach that uses both complementary medicine in the form of yoga as well as conventional medicine practices treats hypertension from multiple directions, making it the most effective form of hypertension treatment.

Greta Grosenbacher, Film and Digital Media

Lenore Wright, mentor

Implicit Rape Culture and Mythology in Modern Media

Media has both a reinforcing and formative effect on society and overall culture. Thus, the way certain demographics are viewed and treated by society is partly influenced by media. Women represent a demographic that has largely been negatively impacted by their depiction in media. Most notably, rape culture, which typically targets women, can be perpetuated and formed by the way women are represented in media. This thesis argues that rape culture is chronically enhanced and engendered through media representations because of the way it consistently objectifies/sexualizes women, depicts suppressive gender role schema, and depicts harmful sexual scripts. To substantiate this argument, this thesis presents a literature review of media effects research focusing on objectification and sexualization, gender role schema, and sexual scripts in media and their side effects followed by a content analysis section. In the content analysis section, *K.C. Undercover*, *Grown-ish*, and *Modern Family* are all analyzed as they are progressive television shows that represent current trends in the film industry. This thesis concludes by drawing attention to the prevalence of implicit rape mythology in the shows analyzed and presumably other television shows and acknowledges the overall reinforcing and formative impact this prevalence has on audiences.

Weston Hall, Astrophysics

Barbara Castanheira Endl, mentor

Asteroseismology of White Dwarf Stars

All single stars that are born with masses up to 8.5 - 10 solar masses will end their lives as a white dwarf (WD) star. Upon entering this evolutionary stage, WDs enter the cooling sequence, where the stars radiate away their thermal energy, and are basically cooling. As these stars cool, they reach temperatures and conditions that cause the stars to pulsate. Using only the light emitted from the surface of the WD, we can measure the periods of the pulsation from the WD. Analyzing these periods allows us to determine internal aspects about the WD such as temperature, mass, and chemical composition with a technique called asteroseismology. Since variable WDs are effectively the same as all other WDs (sans pulsation), this allows us to learn about the internal structure of all white dwarfs, and place important constraints on the WD cooling sequence, and stellar evolution of low mass stars as a whole. For this project, I used the White Dwarf Evolution Code (WDEC) to calculate a model grid of over 125,000 synthetic stars with various temperature, mass and atmospheric abundances of helium and hydrogen, and I calculated their theoretical pulsation periods. I then compared this grid to observed pulsating WDs by matching observed periods with the grid's periods and using those solutions to ascertain information about the star. In this thesis, I describe my approach for this seismological study, and I compare my solutions to those obtained through spectroscopy, as well as previous asteroseismic studies in order to determine the effectiveness of my technique, and the effectiveness of an updated WDEC version.

Rachel Han, University Scholar

Sarah Walden, mentor

On Healthcare's Dismissal of Women's Pain

This thesis will be establishing that there is a greater dismissal of pain for women compared to men by medical practitioners. It will also be defining what constitutes pain in two topics: psychological/emotional pain and pain in endometriosis. It will cover the influence culture and societal views have on views of pain, the dismissal of women's pain as mental rather than biological, and the dismissal of women's pain as overdramatized and exaggerated. It will then discuss measures already in place against bias-influenced pain dismissal within the

medical field and medical schools, as well as further measures that can be taken, with an argument for requiring more logic and reason rather than empathy and emotion. In conclusion, there is a need for a more holistic approach to medicine that considers and acknowledges cultural and social influences and the effects bias creates to inhibit proper treatment of patients in the medical field.

Hunter Alexander Handley, University Scholar

Brian Z. Simanek, mentor

A Tail of Two Palindromic Functions

Burger (2005) related conjugate irrational roots of quadratic equations by the tails of their continued fraction expansions. In the theory of orthogonal polynomials, Derevyagin (2020) gives conditions for a first and second kind polynomial quotient to have J-fraction representation, which share similarities to continued fraction expansions. With some insight from Barry Simon's work, we meld these areas of research with novel results about doubly palindromic J-fractions, taking the form of discrete m-functions. Such functions appear in many areas, including complex analysis, spectral theory, and as discrete Schrödinger operators.

Kirsten Hardin, University Scholar

Maura Jortner, mentor

The Fateful Curse

The goal of this thesis was to craft a polished, engaging middle-grade (ages 8-12) fantasy novel, thereby exploring the field of creative writing. Resources used were analyses of four published middle-grade novels that formed the reading list, in addition to comments from outside readers and from the thesis director. The thesis follows a 600-year-old fairy with a bad attitude named Chryssa, who is sent to the human world by her queen to break a curse on a young girl named Astra. In the process, her life is turned upside down, and she herself is changed for good.

Zachary J. Harper, Biology

Jesse A. Hoover, mentor

The Second Punic and Its Effects on the Roman Republic's Military and Political Institutions

This paper examines the Roman Republic's military and its place in the Mediterranean before and after the Second Punic War. The works of Polybius, Livy, and Appian serve as the primary sources for this paper. Rome's defeats at Trebia, Lake Trasimene, and especially Cannae, were instigators for the implementation of massive reforms to its military institution. Such changes will bring Rome's military force closer to that of the one that conquered the Mediterranean Basin. Though these reforms would bring about Rome's victory in the Second Punic War and beyond, they would also bring with them dire repercussions in the political and social realms of its society. The Republic will forever be changed by its second war with Carthage. Rome would continue to expand through greater military campaigns. This paper argues that the changes to Rome's military during the Second Punic War had a hand in creating the turmoil of the last century of the Roman Republic.

Courtney Z. R. Haubert, Philosophy & Psychology

Richard Sneed, mentor

Behold, The Man: A Transhistorical, Tripartite Meditation on the Phenomenology of Suffering in Eastern Orthodox Soteriology

To experience the life, death, and Resurrection of the Incarnate Christ as salvific and life-giving, Eastern Orthodox soteriology maintains that love and suffering must be understood as a cooperative synergy, rather than an existential conflict. The current project is a meditation on this seemingly paradoxical claim, integrating ancient Patristic and postmodern phenomenological theories of personhood (the "powers of the soul" and "modes of existence," respectively) to analyze how suffering can be experienced as either destructive or as salvific in three domains: the will (*Umwelt*), the heart (*Mitwelt*), and the mind (*Eigenwelt*). Each of these domains is illustrated by one of the three protagonists in Dostoyevsky's *The Brothers Karamazov*. Their stories, albeit fictional, serve to anchor the abstract and theoretical in the lived experience of Orthodox Christians, inviting the reader into the Orthodox perspective of everyday life as sacramental. The limits of this project are such that it should not be approached as a remedy for an individual instance of suffering, but rather as a broad reconstruction of what suffering is and can be from an Orthodox perspective, in light of divine love (*agape*).

Hannah Hittson, Biochemistry

Erika Abel, mentor

Influence of Religious Beliefs on Attitudes Towards HPV Vaccination Among College Students

A hallmark example of vaccine hesitancy due to religious beliefs is the Human Papillomavirus (HPV) vaccine. Approximately 79 million Americans, both men and women, are currently infected with HPV, a DNA virus from the Papillomaviridae family (Meites, 2016). HPV is regarded as the most commonly spread sexually transmitted infection (STI) in the United States, with over 40 different prevalent types (Satterwhite et al., 2013). While the HPV vaccine has been proven to significantly reduce rates of HPV-related cancers, HPV vaccination rates remain below target (Johnson et al., 2016). Christian church affiliation and religious commitment have been suggested as strong indicators of whether or not a parent will vaccinate their child against HPV (Marlow et al., 2009). However, it is unclear whether Christian affiliation versus familial, cultural or religious values most directly influence the decision to vaccinate a child against HPV. To address this idea, we conducted a survey of predominantly religiously affiliated undergraduate students at Baylor University to characterize their views on HPV vaccination. This thesis explores the complex interaction between students' views on sexual purity and their likelihood to vaccinate future children. The results of this survey have important implications for planning promotion of the HPV vaccine among religious people.

Kara Hollingsworth, University Scholar

Clay Butler, mentor

Transition-Relevance Places in Video-Mediated Conversations

Past research in turn-taking has found that turn-taking and transition-relevance places are important to smooth conversation. The use of video-mediated conversation technology impacts timing and formality of turn-taking and transition-relevance places. Because it impacts these two vital aspects of conversation, video-mediated conversation forces users to rework turn-taking mechanisms. Two conversations were recorded through Zoom to study participants' use of pausing as a transition-relevance place. Pausing is common in video-mediated conversation, accompanied by hesitation to start turns and simultaneous turn starts, as well as incorrectly timed backchannel devices.

Stasya Hopp, University Scholar

Bob Darden, mentor

Impacts of Ideology: Sentiment Analysis of the Washington Post and the Washington Times

There is an undeniable history of discrimination against and suffering of black people in America. This, unfortunately, includes instances of police brutality that studies show is disproportionately committed against African Americans. In the past ten years, police-related killings of African Americans have sparked outrage, protests, and movements across the country. This thesis examines how five of those deaths have been covered by the *Washington Post* and the *Washington Times*. The two newspapers lean ideologically opposite ways; organizations can be influenced by their ownership, source of funding, or ideological and political stances of the outlet and its audience. From the perspective of newspaper framing and gatekeeping bias, I've conducted a sentiment analysis of newspaper headlines written in the *Washington Post* and the *Washington Times* about the deaths of Trayvon Martin, Michael Brown, Philando Castile, Stephon Clark, and George Floyd. Within the parameters set for the study, I examined the sentiment results, what the results mean in terms of framing and bias, and the implications for audiences and newspapers alike.

Casey Hulshof, English & Great Texts

Ginger Hanchey, mentor

"And thus was the quest begonne in them": Conversion of the Heart through Catholicism in Le Morte d'Arthur

As one of the most comprehensive and intricate works of Arthurian literature, *Le Morte d'Arthur* remains widely read and intensely studied, even hundreds of years after its publication in 1485. One continually scrutinized topic surrounding this magnificent work is the extent to which it encompasses and encourages authentic Christianity. This thesis converses with the ongoing discourse and also desires to exemplify that Malory's work is not only genuinely Christian, but deeply Catholic. Through interaction with existing scholarship and an original study of the text, this thesis serves to illuminate Malory's *Morte* through the two fundamental roots of the Catholic faith: Scripture and Tradition. Grounding his work in these two pillars, Malory reveals that the greatest Arthurian adventure does not take place on the worldly path, but the spiritual one.

Catherine Hunter, Biology

Bryan Shaw, mentor

Longitudinal Frequency of Leukocoria in Photographs of Person with Retinal Hemangioblastoma

Leukocoria is the abnormal, white reflex of the pupil that can be seen in photography and is often associated with many intraocular diseases. This study was conducted to detect the longitudinal frequency of a patient with a diagnosed retinal hemangioblastoma by collecting 3,846 facial photographs from birth year of 1999 to 2021. Pictures of the patient were individually tagged as pathologic leukocoria or non-leukocoric in both the right and left eye using the computer application Pixave. Metadata from each photograph was then extracted using Photos Metadata Export to determine the original date of each photograph, if flash was present and the presence or absence of leukocoria. Of the 3,598 facial photos tagged of the patient, classification of a leukocoric pupil was found in 158 photographs over a span of 22 years. Leukocoria was found in 151 photographs of the patient's right eye and 7 photographs of the patient's left eye. The right eye accounted for 95.6% of the total leukocoria detected. The percentage of leukocoria increased significantly in 2014 at 5.17% remaining present and increasing to 10.82% in 2021. The findings are consistent with the patient's diagnosis of a unilateral retinal hemangioblastoma in the right eye.

Sher Isada, University Scholar

Matt Asare, mentor

Exploring the Determinants of HPV Self-Sampling among Low-Income Women: An Application of the Theory of Planned Behavior

Cervical cancer screening and continued treatment can prevent cervical cancer but are largely inaccessible among low-income and uninsured women. Implementing self-collect vaginal or cervical samples could promote early diagnosis. However, studies about low-income women's perspectives on HPV sampling are limited. The objective was to analyze how intention to participate in HPV self-sampling is influenced by the Theory of Planned Behavior (TPB) constructs. It is a cross-sectional study utilizing a questionnaire survey with demographic questions and questions that are compatible with the behavioral construct criteria. Around 200 women in the Waco area with varying demographics participated in the study. The results of the study demonstrate that there is a statistically significant relationship between behavioral intention and two TPB constructs: knowledge and attitude. Additionally, the results indicate that there is a significant correlation between race and whether one has heard of HPV self-sampling test. The relation of race and willingness to participate in HPV self-sampling as well as the impact of knowledge and attitude on intention to participate are consistent with previous studies.

Sarah Catherine Jeffries, History & Anthropology

Daive Zori, mentor

Why Were They Buried?: A Comparative Study of Two Viking-Age Coin Hoards in Their Political Contexts

Viking-Age coin-dated hoards have been studied at length in terms of their contributions to the historical and economic accounts of Vikings in Britain during the early 10th century. They are especially useful in providing context for Viking migration and ways of life since they allow large stores of wealth to be situated within a small range of dates. Due to this precision, they enable analysis in terms of political events concurrent with their burial. The goal of this thesis is to provide a comparison of two of the largest Viking-Age coin-dated hoards found in Britain—the Cuerdale hoard and the Vale of York hoard—in order to suggest that the burial of such large hoards was tied to important political events, typically militaristic. I will argue that the best explanation of the burial of Viking-Age hoards of the magnitude of the Cuerdale and Vale of York examples is for the protection of wealth during times of political turmoil.

Esther Jeong, University Scholar

Jeff Levin, mentor

The Response of Faith-Based Organizations to COVID-19 and its Impact on the Community

This thesis explores the response of faith-based organizations to COVID-19 and its impact on the community in Waco, Texas. Although the current zeitgeist of America is characterized by an apparent decline in religiosity, though not spirituality, studies have shown the strengths and positive consequences of faith-based organizations on community health. When COVID-19 arose in 2020, many communities were heavily impacted economically, socially, and personally, with the greatest effects observed in low socioeconomic-status neighborhoods. This was the case in Waco. Accordingly, I have focused on four faith-based institutions serving this population—Harris Creek Baptist Church, Mosaic Church of Waco, Mission Waco, and Waco Family Medicine (WFM)—evaluating their response to COVID-19 especially how they provided resources to their constituencies and to the larger community. Two of these groups are churches of different denominations and congregational makeup, Mission Waco is a missional organization that focuses on people experiencing homelessness, and WFM is a faith-based medical care provider in the heart of Waco.

Sarah C. Jones, University Scholar

Erika Abel, mentor

Addressing Cervical Cancer Prevention in McLennan County, TX

Persistent infection with human papillomavirus (HPV) is known to cause up to 99.7% of all cervical cancers. Two highly effective cervical cancer prevention methods exist – vaccination against HPV and cervical screening. Studies have documented the motivating effects clinical intervention has on preventative care compliance. Through the use of Bayesian time-series forecasting and a thorough healthcare needs assessment, this study identifies McLennan County, Texas as a candidate for cervical cancer care intervention. Currently, only 54.9% of Texas residents have completed the series of HPV vaccinations, and predictive modeling anticipates stagnation in the rate of vaccination within McLennan County. In order to address this problem, implementation of a clinic combining the services of HPV vaccination and cervical cancer screening is proposed. Cervical cancer is an easily preventable disease, thus effective clinical strategies for its prophylaxis should be introduced to the medically underserved population of McLennan County.

Min Jung, University Scholar

John Louis Wood, mentor

Total Synthesis of (±)-Dracocephalone A

In 2003, the Uchiyama group isolated Dracocephalone A along with three other Icetexane diterpenes. Evidence suggests that it possesses mild trypanocidal activity against Chagas disease. The first total synthesis of (±)-Dracocephalone A is described. The synthesis requires 8 steps from two previously known molecules. The key transformation includes the Suárez reaction to assemble a tetrahydrofuran ring.

Andy Kanz, University Scholar

James Kendrick, mentor

On Resurrecting Christian Cinema: A Study of Genre, Dramatic Liberties, and Aesthetics in James K. Friedrich's Life of St. Paul Series

Over the past few decades, there has been a growing tendency for independent Christian filmmaking to assert itself as a “wholesome” alternative to secular mainstream content, often at the expense of high-quality writing, production value, and a general appreciation of the film medium as something more than an avenue for messaging. To identify filmmaking methodologies that may aid in finding a middle ground between Hollywood and contemporary evangelical cinema, this thesis analyzes the work of one of the Christian film industry's pioneers, Reverend James K. Friedrich. As an avid lover of the movies, Friedrich dedicated his career to creating high-quality Christian films to evangelize, educate, and entertain believers and nonbelievers alike. The *Life of St. Paul* series (1949-1951) is generally considered the pinnacle of his work, and this thesis studies how it utilizes genre conventions, scriptural dramatic liberties, and mainstream aesthetics to bridge the gap between secular and evangelical cinema.

Arjun Kapur, Medical Humanities

Annie T. Ginty, mentor

Is Resilience Associated With Cardiorespiratory Fitness and Measures of Anxiety Post-Acute Stress Task?: Fitness's Correlation with Decreased Somatic & Cognitive Anxiety

Cardiorespiratory fitness, a physiological health variable, is associated with mental health. However, not many studies have looked at a psychological characteristic's association with cardiorespiratory fitness and mental health.

Aim: examine the nature of the relationships of cardiorespiratory fitness, resilience, and somatic & cognitive anxiety measures post-acute stress task. Study: 458 (61.8% female, 66.4% Caucasian, and median age was 19.5 years [SD=1.25]). Participants completed the Connor-Davidson Resilience Scale (CD-RISC) questionnaire, 10-minute baseline-period, and a 4-minute acute psychological stress task. Blood pressure (BP) and heart rate (HR) were monitored throughout the baseline and stress task. Post-stress task, participants completed the Immediate Anxiety Measurement Scale (IAMS). Cardiorespiratory fitness in METS was estimated utilizing the Jurca formula, $((\text{gender}) \times 2.77) - ((\text{age}) \times 0.10) - ((\text{BMI}) \times 0.17) - ((\text{resting heart rate} \times 0.03) + (\text{physical activity score}) + 18.07$. Significant relationships were found among all three measures of cardiorespiratory fitness, resiliency, and somatic & cognitive anxiety. Cardiorespiratory fitness was positively correlated with both cognitive and somatic anxiety impact ($r = .245, p = 0.010$; $r = .200, p = 0.010$, respectively) and was negatively correlated with both cognitive and somatic anxiety intensity ($r = -.253, p = 0.010$; $r = -.248, p = 0.010$, respectively). Cardiorespiratory fitness was positively correlated with resiliency ($r = .222, p = 0.010$). Also, resiliency was positively correlated with both cognitive and somatic anxiety impact ($r = .200, p = 0.010$; $r = .171, p = 0.010$, respectively) and was negatively correlated with both cognitive and somatic anxiety intensity ($r = -.214, p = 0.010$; $r = -.179, p = 0.010$, respectively). Results provide strong support towards the conclusion that all three variables are associated with one another. The thesis provides evidence that cardiorespiratory fitness is significantly related to both somatic & cognitive anxiety and resilience.

Shaler Keenum, University Scholar

James Kendrick, mentor

Are You Watching Closely? Truth and Lies in the Films of Christopher Nolan

In each of Christopher Nolan's films, lying plays a role in the shaping of the film's narrative. Nolan also crafts his films in a way that often leads his audience astray, enabling him to lie to the audience through the structure of his films. With this in mind, this thesis analyzes several of Nolan's films through the lens of Plato's noble lie. To begin, the necessary criteria for a lie to be considered noble are established. These criteria are then used to evaluate diegetic and non-diegetic lies within *Memento*, *The Prestige*, and *The Dark Knight* Trilogy. Through these films, Nolan demonstrates an understanding of the concept of the noble lie and reestablishes the lie as the heroic lie. By doing so, Nolan demonstrates the philosophical capability of film to reveal truth through lies and provide audiences with a transcendent experience to reach the underlying truth of his narratives.

Meredith Kelly, University Scholar

Melinda Nielsen, mentor

"All I Do is Done for the King": Edith Stein on the Feminine Vocation with a Special Focus on Spiritual Maternity

Edith Stein is a name with many connotations—scholar, philosopher, convert, teacher, and saint. Raised an orthodox Jew, Stein lost her faith at a young age, and eventually to Catholicism. After her conversion to Catholicism, Stein turned her philosophical pursuits towards answering the question of what it means to be a Catholic woman. In her collection of essays and lectures *Essays on Woman*, Stein claims that the feminine vocation is towards spousal love and motherhood. However, where does this leave women who choose virginity or cannot have children? In response to this concern, Stein says that such women are called to express the feminine vocation through spiritual maternity. In this thesis, I examine how Stein defines the feminine soul and the feminine vocation. Stein uses Scripture, tradition, psychology, and biology to argue for the feminine vocation of being a spouse and mother. In my final chapter, I will investigate Stein's argument for spiritual maternity as a legitimate—and, in fact, the highest—expression of the feminine vocation. Throughout her philosophy of the feminine vocation, Stein upholds the Blessed Virgin Mary as the model for all women, but especially for spiritual mothers.

Gabrielle Kennedy, International Studies

Sergiy Kudelia, mentor

The Evolution of Russian Electoral Interference: 2016 and 2020 U.S. Presidential Elections

Electoral interference has been a card in major powers' hands since before digital elections. Despite this, the 2016 U.S. presidential election brought this phenomenon to the fore of American minds. Russia's electoral intervention in the 2016 U.S. presidential election was characterized through the use of bots to amplify disinformation on social media. The U.S. government and private sector response meant to deter Russia from interfering in future elections, with the private sector paying special attention to limiting the use of bots on social media platforms. However, Russia intervened again in 2020, but with new tactics and messaging. With this topic still being highly contentious, this thesis provides data and analysis suggesting that Moscow innovated in the inter-election period between 2016 and 2020, rather than decreased its efforts.

Lauren Ketchum, Political Science

David D. Corey, mentor

Multiculturalism and National Identity in an Ethnically Diverse Society

This thesis examines the relationship between multiculturalism and national identity particularly through the lens of the moral and political arguments for and against ethnic diversity. As a preliminary assessment, this thesis will first outline relevant definitions of identity, diversity, and national identity. Then it will analyze the various arguments in favor of multiculturalism on both the moral and political grounds, followed by the ethical and political criticisms, respectively. By examining the various arguments for and against multicultural diversity, it becomes clear that the ethnocentric conception of identity that follows from multiculturalism challenges civic unity and national identity. It not only diminishes individual rights but incentivizes ethnic division, competition, and hostility in the public sphere. If diversity truly is a societal good, it must be adjusted to uphold universal values and civic virtue upon which national unity depends.

Andrew Kim, University Scholar

William G. Hoy, mentor

COVID and Coping: A Grounded Study of Isolation and its Effect on Grief

Communities all over the world have been fighting the SARS-CoV-2 coronavirus ever since late 2020, with countries struggling to maintain their economic, political, and healthcare infrastructure amidst the chaos. As COVID cases are slowly beginning to decrease, researchers are examining a variety of ways that this pandemic has affected the population long term. One such issue has been sweeping through the general public: the inability to properly grieve for a loved one. For those that have lost someone close in the pandemic, the quarantine policies currently implemented has confined these people into a near solitary state of grieving. Thanatologists share current health concerns for this population, believing that grieving people may be unable to pick their lives back up after being forced to isolate for so long. This study was designed to explore the perceptions of individuals who have lost a loved one during the COVID-19 pandemic in order to generate a substantive theory on ambiguous loss and perceptions of successful coping. This qualitative study utilized an active interviewing process following a Glaserian grounded-theory design to eventually identify the emerging themes of helplessness, the loss of dignity, and lack of community. An understanding of these findings provokes further thought into the long-term mental health assistance necessary for the growing population that has experienced the impact of losing a loved one during the pandemic.

Andy M. Le, Biochemistry

Dwayne D. Simmons, mentor

Examining the Relationship between Alpha-Parvalbumin and Oncomodulin: A Pilot Study on the Calcium-Binding Proteins of the Inner Ear

The regulation of calcium (Ca^{2+}) is essential to the proper function of outer hair cells (OHCs) in the mammalian cochlea. Trauma and aging are known to disrupt Ca^{2+} signaling as well as cause the malfunction of OHCs. Therefore, Ca^{2+} signaling may be strongly linked to the viability of OHCs. In both mice and humans two calcium-binding proteins are highly expressed during development of hearing and during aging: oncomodulin (OCM) and alpha-parvalbumin (aPV). These mobile Ca^{2+} buffers are EF-hand binding proteins, consisting of helix-loop-helix domains. Despite their similar structure and function, we hypothesize that in the absence of OCM, aPV plays little or no role in OHC function. To test this hypothesis, we performed distortion product otoacoustic emissions (DPOAE) assays on mice with a single knockout (SKO) of OCM as well as on mice with a double knockout (DKO) of both OCM and aPV. Results from this pilot study suggest that there is no significant difference in age-related hearing loss between the SKO and DKO mouse phenotypes. However, increased aPV expression in response to a lack of OCM remains to be investigated.

Yejin (Sally) Lee, Psychology

Stacy Ryan-Pettes, mentor

Association Between Cumulative Stress and Family Environment as a Predictor of Arrest Following Multisystemic Therapy

Multisystemic Therapy (MST) is an intensive, family-based treatment that is well-established for youth with serious criminal offenses. MST has produced significant short and long-term treatment success in numerous randomized controlled trials and published outcome studies, including rearrest ranging from 20% to 70%, with a median of 42%. While this outcome is impressive, not all youth who receive MST avoid rearrest. Despite high levels of support for the effectiveness of MST, relatively little is known about how end-of-treatment child and family characteristics (that are direct or indirect therapeutic targets of MST) interact to influence arrest outcomes. This study used a prospective, longitudinal design to examine the association between the number of stressful life events experienced by youth by the end of treatment (cumulative stress) and family environment (i.e., family cohesion and flexibility) at the end of MST predict the likelihood of arrest one year later. Results showed a significant interaction between cumulative stress and family environment. At higher levels of family cohesion and flexibility, more cumulative stress increased the likelihood of arrest after treatment. The findings are consistent and inconsistent with the extant literature, suggesting that the relation between cumulative stress and family environment is complicated for families with youth exhibiting serious aggression and delinquent behaviors. The results further highlight the importance of examining the mechanisms of change for MST. Limitations in the measurement of family environment are discussed, calling for the development of measures that may more adequately capture family environment in families referred to MST.

Isabelle Lin, Communication Sciences and Disorders

Kristle Soto, mentor

Interventions for Feeding Disorders in Autistic Children: Behavioral Therapy vs. Sensory Integration

Sensory Integration Therapy (SIT) is a commonly utilized method of treatment for feeding disorders in autistic children. However, it has received less recognition than behavioral therapies because SIT is a dynamic therapy, and it is more difficult to quantify the effects of SIT in an experimental setting. Through a review of current literature, this thesis project explores the effectiveness of Sensory Integration Therapy (SIT) as observed in conjunction with behavioral interventions for the treatment of feeding disorders in children with autism spectrum disorder (ASD). This review evaluated the results reported in ten studies that used SIT, behavioral therapy, or a combination of

interventions to treat disordered feeding in children with ASD. The results suggest that sensory-based interventions yielded positive results, especially when combined with behavioral interventions, in individual cases but it is difficult to gauge the effectiveness of these methods outside the context of studies with small population sizes due to the highly individualized feeding therapy plans that each client requires. Despite the limited findings on the effectiveness of these methods, a survey of clinicians showed that SIT is used by the majority of professionals to treat feeding disorders.

Andrew Lindbloom, Anthropology

Jeff Levin, mentor

Healthcare as a Fundamental Human Right: The Alma Ata's Role in Shaping Health Policy in Three North American Countries

The World Health Organization's Alma Ata Declaration set a new world standard for human rights following its publication in 1978. By declaring health and healthcare as fundamental human rights, it pushed the boundaries of social safety nets provided by most of the world to one that was cognizant of the complexity of wellbeing and social determinants of health. The following is a review of the Alma Ata Declaration that explores its theory and application. It unpacks the political, philosophical, and ethical elements of the Alma Ata, and it conducts a comparison among three North American countries – Canada, The United States, and Mexico in the post-Alma-Ata era. The review ends with a few concluding remarks about the future of U.S. health policymaking and implementation. Overall, the review aims to provide a comprehensive understanding of the Alma Ata Declaration by exploring its intended goals, ideals in action, and impact on future health policy.

Kathryn M. Loeff, University Scholar & History

Julie Anne Sweet, mentor

The Perils of Power: Thomas Hutchinson, Thomas Gage, and the Perception of Authority, 1770-1775

Thomas Hutchinson and Thomas Gage were the last two colonial governors of Massachusetts. Thomas Hutchinson was the last civilian governor, while Thomas Gage was the first and last military governor. Hutchinson walked a fine line of loyalty, attempting to side with both the crown and the colonists, to smooth things over but also to ensure his upward mobility in British government. Gage, quite the opposite, was focused more on executing orders than political position, and oftentimes was chastised for his caution as a result. Both men, representing two different types of attitudes toward their shared position of authority, ended up in London after receiving a discharge from Parliament. Through the employment of primary and secondary sources, I examine the two men's respective times as colonial governor and argue that although both were loyal to the British Empire in a time of increasing turmoil, the reason for their individual and collective failures in this position was their perception of power and their handling of authority.

Camryn Lutes, Political Science

David Clinton, mentor

Tracing American Diplomacy: A Survey of Diplomatic Theory from Before and After the Cold War

This thesis examines different writings on diplomatic theory to see how philosophical and pragmatic attitudes of diplomacy changed from before and after the Cold War. The scope of this research includes contributions from the following authors: Hans J. Morgenthau, Hedley Bull, Alexander Wendt, Henry Kissinger, Cecil Crabb, Joseph Nye, Etan Gilboa, Hussein Agha, and Paul Sharp. Morgenthau and Bull represent the American attitudes on diplomacy coming out of the second World War with close ties to traditional international relations theories. Wendt, Kissinger, and Crabb's work all come from the height of tensions in the Cold War, and the rest of the authors

surveyed represent the post-Cold War era of American diplomacy. This thesis finds a clear trend in how diplomatic theory changed pragmatically and philosophically from before and after the cold war, with peaks in philosophy before and after and a peak in pragmatism during the Cold War.

Isabella D. Martingano, Health Science Studies

Lauren Barron, mentor

A Quantitative Analysis of the Race-Correction Factor and Vaginal Birth After Cesarean Eligibility

In 2007, the Maternal Fetal Medicine Units Network created a calculator that provided an early estimate of the success a woman would have if she chose to attempt a vaginal birth after cesarean delivery (VBAC). Race was one of six demographic variables used in the algorithm. Women who identified as either Hispanic or African American received a score seven points lower than Caucasian women, thereby making minority women on average less likely to be recommended for a VBAC. The use of a race-correction factor is a problematic practice that has received pushback from physicians across the country due to the concern that it may propagate race-based medicine and exacerbate health disparities. Therefore, the aim of this thesis was to assess how many women at a federally qualified health center were negatively affected by the race factor during a one-year period. From April 2020 to April 2021, the participating hospital had a VBAC rate of 1.90%. The authors found that without the use of race adjustment, this number could have been as high as 3.03%. To continue paving the way for an equitable healthcare system, the tools and algorithm used to treat patients must be critically analyzed and assessed.

Siegrid Massie, Journalism

Robert Darden, mentor

Do Re Me Too: Examining Sociopolitical Women's Rights Messages Within Me Too Era Music

The explosion of the Me Too Movement in late 2017 sent shockwaves that have been felt globally throughout the professional and entertainment industries. Just as every other political and social movement that has come before, art and music has reflected the voices of change. This thesis explores the interactions between fourth wave feminism and the Me Too movement with popular music and protest songs. Over the last five years, private citizens and celebrities have generated music to use as a tool to express unity, share their personal experiences, and mobilize the cause through song. Artists like Beyoncé Knowles uses her music to express the struggle that come with racism and sexism. Whereas musicians like Taylor Swift highlights the double standards in behaviors between men and women. The first part of the thesis dives into the history of the feminism waves and the Me Too Movement, and the second half analyzes the use of protest and popular music in history and the present-day cause. Through understanding the ways in which art and society interact, this thesis aims at showing the power that music has to inspire sociopolitical ideas of change

Calder Meis, Theatre Performance

DeAnna Toten Beard, mentor

CRY HARD: An Original One-Man Show as Insight into Historical Adaptation and Comic Theory

This thesis centers on the writing and production of an original one-man show about Alexander the Great, *CRY HARD*. The popular action film *Die Hard* (1988) apocryphally misrepresents the words of Alexander as noted in Plutarch's *Moralia*, creating the opportunity for dramatic conflict and comic subversion as Alexander attempts correct his misaligned legacy. This creative product serves as a vehicle for an exploration of the intersection of two narrow narrative fields. Adaptation of biographical history into a comic form is without much scholarship. The one-man show is a challenging narrative form with its own set of insular rules dissimilar to those of traditional stage-plays. This thesis posits two inter-connected methodologies to overcome these narrative obstacles. First, when

adapting history into comedy, I posit that the primary intent of the playwright should be to make the fact familiar. That is to say, one should distill the essence of the historical fact and connect it to something more universal, so that into it the entire audience can vest emotional interest. More, I assert that a character-writing model centered on the principle of laughter as a socially corrective gesture, as found in Henri Bergson's *Laughter: An essay on the meaning of the comic*, is an effective approach that generates empathetic ambiguity and comic potential.

Matt Mills, University Scholar

Richard Jordan, mentor

Realism Under Heaven: The Strategic Behavior of Imperial China

The Chinese state is historically a realist political actor. Realist theory expects states to perceive the international system accurately, think competitively regarding other states, and act rationally according to their self-interest. Chinese statesmen may also have possessed the traditional *tianxia* ("all under heaven") worldview, which presupposes China's centrality and superiority. In this plausibility probe, I use four historical cases from the Western Han and Tang dynasties to determine whether *tianxia* might have affected China's realist behavior. I find that *tianxia* ideas may affect China's behavior when the state is strong. In these situations, if the adversary is submissive, *tianxia* may decrease the coerciveness of China's expected behavior; if the adversary is non-submissive, *tianxia* may instead increase China's coerciveness. Despite being a consistent thread throughout China's historical behavior, *tianxia* does not affect China's perception of nor disposition towards the international environment in any of the four cases. Consequently, I conclude that realism reigns under heaven, except, potentially, when the Chinese state has the power to enforce *tianxia* ideas.

Emma Miner, University Scholar

Joe Coker, mentor

How Characters Across Four Toni Morrison Novels Embody C.S. Lewis' Four Loves

Toni Morrison is a Nobel Prize winner and renowned author known for her moving and unabashedly honest stories of Black individuals living in America. C.S. Lewis is considered one of the most influential authors of the twentieth century known for his theologically laden novels and scholarly writings. In this thesis I will argue how relationships between characters across four of Morrison's novels embody the four loves discussed in C.S. Lewis's *The Four Loves*. The relationship between sisters Frieda and Claudia MacTeer and Pecola Breedlove in *The Bluest Eye* embody affection; Sula Peace and Neal Wright embody friendship in *Sula*; Paul D and Sethe of *Beloved* embody eros, and in *A Mercy* Florens and her unnamed mother embody charity. Due to Morrison's realistic portrayal of people, characters in her novels occasionally fail to perfectly encapsulate their designated love. I will discuss these failures in addition to their success in embodying their prescribed love.

Audrey Mirasola (MA), Baylor Business Fellows, Economics & Mathematics

Zachary Ward, mentor

The Integration of Refugees and Economic Migrants in the U.S. from 1845 to 2017 (Masters Thesis)

Research shows that refugees in the United States experience faster economic growth than other immigrants, in part because they have limited incentive to return home. However, this pattern has primarily been documented in the late 20th century, making it unclear whether faster economic assimilation is an inherent characteristic of refugee flows, or whether it is unique to recent decades. This paper uses data between 1850 and 2017 to compare the economic assimilation of refugee cohorts to economic cohorts. I find that after 1900, refugee cohorts start off at a lower average occupational prestige than both their economic immigrant and native-born counterparts upon arrival, but refugees economically assimilate at a faster rate and, in some periods, overtake the occupational

prestige of economic immigrants after two decades. Older arrival periods display more complex patterns of assimilation where refugees do not always start off below natives or assimilate more quickly with more years of stay.

Noelle Mitchell, University Scholar

Elizabeth Corey, mentor

Processing Disillusionment in Modern England: John Betjeman's Influence on Philip Larkin

Reacting to an era of high Modernism, which valued myth and elite academic references, two British poets, John Betjeman and Philip Larkin represent an intentional return to simplicity and a distinct time and place in mid-century Britain. John Betjeman and Philip Larkin were incredibly supportive of each other's poetry, both publicly and privately. However, criticism of the two poet's interactions is lacking. This thesis shows how Betjeman's visual attentiveness to English culture within his poetry and prose influenced Larkin's own poetic style and thematic proclivities, earning John Betjeman a rightful position as one of Larkin's chief literary influences. Some of the two poets' most famous poems, such as "In Ireland with Emily" and "Church Going" as well as "Before the Anesthetic" and "Aubade," serve as touchstones for exploring their mutual interests. Despite the poets' shared focus on restoring a simplicity of rhyme, form, and accessible language, they present at times opposed visions of religion, faith, and hope while ultimately bemoaning the loss of a cohesive English culture.

Lauryn Moline, University Scholar

Alex Beaujean, mentor

Planning for the Future Shortens the Future: Attention, the Default Mode Network, and the Tie to Health Detriments

When people plan for the future, it often is for years down the line. Even if one is excited about the future, too much time spent not in the present can lead to more depressive symptoms and thinking of a happy moment in life can result in people being sadder than if they were to live in the present moment. This literary study investigates how future-thinking could be a detriment to one's future in the sense of the toll that it might have on a person's health. In pursuit of a greater grasp of this relation, this study narrows in on a definition for attention and the factors that influence it, explores the role of the default mode network in contrast to the central executive network within the brain, examines how depression can lead to shorter lives, and analyzes how depression relates to the default mode network. Following this research, proposals can be made about how to reduce the incidence of depression that correlates with the increased activation of the default mode network.

Isaac Montgomery, University Scholar

Jeannette K. Marsh, mentor

Writing Nothing: A Critical Guide to Asemic Poetry

Asemic writing is marks made on a medium which are intended to look like language. Since the start of the asemic movement in the 1990s, asemic writing has gained popularity with avant-garde poets and calligraphers, and has gained circulation online and physically. Despite the growth in this genre, academic research on this topic is lacking, especially relating to the interpretation and criticism of these works. This research aims to fill this gap by preparing critics to identify asemic writing and place it in historical context. It then gives perspectives on how asemic writers frame their work, and why this framing matters to the interpretation process. Finally, it proposes a model on how asemic writing impacts the brain, and how current cognitive science understandings of reading might inform the process of reading asemic writing. All of these lines of inquiry are layered into a single critical method, and readers see this method applied to several important works of asemic writing. In short, when looking at a piece of asemic writing the critic must ask 1) does this look good? 2) do the pieces of information surrounding

a poem that are available to the reader work together? And 3) does the piece look like writing? When readers are able to understand the importance of these questions and effectively answer them about a given piece of asemic writing, they are prepared to begin the work of interpretation and criticism.

Teresa Moorhead, Biochemistry

Paul Carron, mentor

An Examination of Philosophical Perspectives on the COVID-19 Pandemic

Throughout the COVID-19 pandemic, policies were quickly evolving and adapting to meet a variety of needs. One concern when developing these policies was ensuring that these policies were moral and just. This thesis examines what different moral philosophies, namely Libertarianism, Utilitarianism, and Liberalism, believe is just and how these theories were and could be applied when creating COVID-19 policies. Policies concerning non-healthcare essential workers, single mothers, and school aged children were specifically addressed and examined since many individuals in these groups were disproportionately affected by the constant change in policies. Examination of these theories reveals that Liberalism is the most applicable in modern day because of its emphasis on creating policy with the greater good in mind.

Elizabeth Moran, University Scholar

David Corey, mentor

Lydia, Come Out!

This thesis explores the stage of liberalism that America has reached and engages with the emptiness of continual freedom-seeking that comes at the expense of living a full life in community with God and others. The creative aspect of the piece follows a girl named Lydia through her first semester of college where she becomes involved in an activist movement while at the same time learning about Jesus. Through Lydia's journey, the reader learns the need to identify and prioritize what is truly important in one's life.

Cameron Mullinax, Great Texts & Arabic and Middle East Studies

Lindsay Martin, mentor

Refracted Light: Moral Imagination, Ordered Desire, and Apprehending the Beautiful, Good, and True within Literary Myths

In a conversation with C.S. Lewis, J.R.R. Tolkien once said that “just as speech is an invention about objects and ideas, so myth is invention about truth” (*On Stories*, xiv). Both believed that because humanity has been created by God, the myths we weave—while certainly containing flaws—can and often do “reflect a splintered fragment of the true light, the eternal truth that is with God,” who is the source of all creation (*On Stories*, xiv). Authors George MacDonald, J.R.R. Tolkien, and C.S. Lewis perceived the intrinsic value of myths and their ability to reveal divine realities about the world we inhabit as human beings. Each writer believed there is a sense in which great myths serve a crucial teleological function in enabling fallen individuals to rightly perceive God as the creator and sustainer of all things and to participate with the glory of his creation through ordinate desire. This project seeks to look at the dynamic relationship between ordered interior love and the apprehension of that which is Beautiful, Good, and True in creation and the role both play in shaping an individual's moral imagination. In light of this aim, this project explores how three specific literary myths—Tolkien's *The Silmarillion*, MacDonald's *Phantastes*, and Lewis's *Till We Have Faces: A Myth Retold*—offer varying reflections, from a cosmological all the way to an individual level, upon the vital role of well-ordered interior love (along with the dangers of its opposite) and the proper apprehension of that which is Beautiful, Good, and True in the process of individual moral formation. I argue that each of these texts intentionally employs the sub-creative and teleologically significant genre of myth to

reveal differing aspects of human desire and true participation in the divine life with the ultimate goal of drawing readers into a deeper encounter and even union with what all three authors believed was the Divine Source of all that is Beautiful, Good, and True.

Claire Nevill, International Studies

Ivy Hamerly, mentor

The Political Weaponization of Immigration in the United States

In the past months and years, immigration has remained a “hot button” issue that Americans politicians are quick to criticize, but slow to reform. Republicans and Democrats have long supported comprehensive immigration reform, but despite acknowledging the downfalls of the immigration system, the policy stalemate over immigration remains. Why? This thesis posits that the policy stalemate over immigration began increasing in the 1990s and remains in place because the stalemate is strategically used by American politicians as a mechanism to gain political advantages and win elections. The beginning of the thesis analyzes the timeline of the increasing immigration stalemate and focuses on the United States while presenting evidence to prove the claim. A comparative analysis of the United States, Mexico, and Canada is also used to gain perspective on why the United States’ struggle with an immigration policy stalemate is different than neighboring countries.

Nathan Newton, Biochemistry

Panagiotis Koutakis, mentor

The Effects of Sulforaphane Treatment in an in vivo Model of PAD

Peripheral artery disease (PAD) is a disorder caused by atherosclerosis in the peripheral arteries, especially the legs, which affects mobility and quality of life as the disease progresses. The blockage in the arteries leads to cycles of ischemia and reperfusion, damaging the surrounding skeletal muscle tissue. This damage primarily results from mitochondrial dysfunction caused by the cyclic changes in oxygen concentration. As most treatments for severe PAD require invasive surgery, in this study we sought to determine if the phytochemical sulforaphane could be used as a noninvasive method to address mitochondrial dysfunction in an *in vivo* murine model of PAD. Sulforaphane was administered in animal drinking water via two different treatment protocols. One group received sulforaphane supplementation for 7 days pre and post hind limb ligation, whereas the other treatment group only received sulforaphane for the 7 days following surgical ligation. Control mice received normal drinking water. The sulforaphane-treated groups experienced better post-surgical recovery as measured by critical limb use and percent body weight change. The soleus muscle was extracted from all animals 7 days following hindlimb ligation, and muscle mitochondrial function (oxygen consumption and reactive oxygen species (ROS) production) was assessed using fluoro respirometry. Although muscle from sulforaphane-treated mice showed an increase in oxygen consumption when compared to control animals, ROS production was also increased. The increase in ROS production was unexpected considering previous research suggests sulforaphane acts to reduce ROS production. However, there was much inter-individual variability noted in the data of the current study. Although there are some promising results for sulforaphane as a potential treatment for PAD, there is a clear need for further study. In the future, it will be important to increase the number of mice per experimental group to decrease standard deviation as well as refine our data normalization protocols associated with the experiments.

Vy Nguyen, University Scholar

Thomas McGrath, mentor

Metabolism and Pharmacodynamic Effects of Myristicin

Food chemistry is a branch of science that studies the effects of food and spices on the human body. Nutmeg, a spice most commonly found in desserts and ethnic foods, contains myristicin, a compound that had been studied extensively and found to alter the body's physiology. In this Thesis, the properties, pharmacodynamic effects, metabolism, and potential therapeutic uses of myristicin were investigated and consolidated. Beyond enhancing the flavor of food, myristicin can reduce inflammation by non-selectively inhibiting cyclooxygenase-2 (COX-2), prevent the proliferation of tumor cells by increasing the rate of apoptosis, and decrease oxidative stress by inhibiting the production of radical oxygen species. On the other hand, myristicin can negatively affect the nervous system if an overdose occurs. When a large amount of myristicin is consumed, it can transform into an amphetamine derivative, adopt the conformation of lysergic acid diethylamide (LSD), and cause the user to experience strong hallucinations and symptoms of psychosis. However, despite the adverse side effects, further research should be done into this seemingly innocuous spice to potentially translate these findings into therapeutics for diseases such as cancer, arthritis, and diabetes.

Kaitlin Nunn, Biology

Erica Bruce, mentor

The Effects of Acute Diesel Exhaust Particle Exposure to P-glycoprotein Function and Expression in the Blood-Brain Barrier

Diesel exhaust particles (DEP) are a major component of air pollution and a major source of concern for individuals in urban environments because once inhaled, DEP may reach the brain, where chronic DEP exposure can contribute to neurodegenerative disorders. One of the main functions of the blood-brain barrier (BBB) is to limit the entry/action of pathogens and xenobiotics such as DEP. Briefly, the BBB is composed of a single layer of highly specialized cerebrovascular endothelial cells surveilled by microglial cells that can either improve or aggravate the BBB's response to neurotoxic agents. Specifically, P-glycoprotein (P-gp), a multidrug transporter of clinical significance in the BBB, is responsible for the efflux of small molecule drugs and many harmful chemicals from the CNS. Importantly, while P-gp is dysregulated under different neurodegenerative diseases and cancers, the effect of DEP (i.e. air pollution) exposures on P-gp, to our knowledge, has not been evaluated. Therefore, the goal of this study was to evaluate the effects of acute (24 hr) DEP exposure on the function and expression of P-gp in the BBB alone (i.e. in endothelial cells) and in the BBB with microglia in vitro. To do this, we used immunocytochemistry to image P-gp, Rhodamine-123 Accumulation Assay to measure P-gp activity, and RT-qPCR to measure relative P-gp expression before and after DEP exposure. Overall, this work is significant because it is the first to evaluate the effect of DEP exposure on P-gp, which may be implicated in air-pollution-related neurodegenerative disorders.

Jesus Andres Osornio Salazar, Biology & Spanish

Karol Hardin, mentor

Heritage-Language Healthcare Workers: Medical Interpretation as an Approach Towards Inclusiveness in Healthcare

Hispanics in the United States are considered one of the fastest growing ethnic groups, comprising 18.7% of the total population (U.S. Census Bureau, 2020). Spanish is now spoken at home in 13% of the population, making the country the second largest population of Spanish speakers in the world, behind Mexico (Thompson, 2021). Despite the increased prevalence of Spanish, language discordance for Spanish-speaking patients remains a critical obstacle to accessing healthcare. This thesis examines the use of bilingual Hispanic healthcare workers as interpreters at a community health clinic (CHC) in Waco, TX. Using data from an analysis of medical consultation videos from the CHC, interpreter self-reported Spanish proficiencies, and a formal interpretation assessment (the

Qualified Bilingual Staff Assessment), this thesis explores advantages and disadvantages of utilizing dual-role bilingual staff as medical interpreters. Results of this study highlight current issues with heritage-language staff who interpret without adequate training. Recommendations are also provided for standardization of training and assessment for medical interpreters.

Megan Palen, University Scholar

Barry Harvey, mentor

Dietrich Bonhoeffer: Discipleship and Culturally Accommodated Christianity

In the minds of many scholars, Christian church attendance in the United States frequently does not accord with the actions of discipleship that Scripture mandates. Christianity is reflective of culture instead of the kind of belief and obedience that those in the Bible represent. This thesis discusses Dietrich Bonhoeffer's understanding of biblical discipleship that is in contrast with the idea of a culturally accommodated Christianity. It then examines Bonhoeffer's relevant writings and teachings for insights that can assist modern Christians as they pursue a faithful discipleship in their respective circumstances.

Sainamitha R. Palnati, Biology

Dwayne D. Simmons, mentor

ER Stress and Noise-Induced Hearing Loss

Noise-induced hearing loss (NIHL) is a result of persistent or prolonged exposure to elevated noise levels that affects sensorineural capabilities. The cochlear hair cells of the inner ear are extremely vulnerable to noise exposure, leading to hair cell injury and loss of notably the outer hair cells (OHCs) as they play a role in amplification of sound. Due to the selectivity and sensitivity of OHCs, we hypothesized that noise exposure will induce endoplasmic reticulum stress (ER stress) within the hair cells leading to the onset of unfolded protein response (UPR) and eventually apoptosis resulting in hair cell death. Previous studies have shown that noise exposure can induce inflammatory pathways and stress conditions injuring hair cells which may result in hair cell death. We performed immunofluorescent experiments, confocal imaging, and Fiji/Image J analysis of adult wildtype (WT) and adult knock-out (KO) mice cochlea post-noise exposure. Our results suggest that noise exposure induces ER stress in the OHCs of the cochlea due to the upregulation of inflammatory and repair pathways such as UPR and pro-apoptotic components.

Samantha Papageorge, Finance & Management Information Systems

Shane Underwood, mentor

How "Pieconomics" is Crucial to Firm Growth and Overall Market Health

While Alex Edman's landmark work *Grow the Pie: How Great Companies Deliver Both Purpose and Profit* introduces the ideas of "Pieconomics" and "growing the pie," it leaves the reader wondering how these arguably subjective opinions are applicable within actual corporations, as well as their impact on firm growth and market health. This thesis outlines Edman's ideas and compares them to other arguably similar concepts, such as shareholder theory, corporate social responsibility, and enlightened shareholder value, among many others. Finally, this thesis also contains case studies conducted on two similar technology corporations, Microsoft Corporation and Amazon, and analyses their impact from a financial and social perspective to determine how "Pieconomics" applies to a large-scale corporation, as well as considering the trickle-down effect to enterprises of varying sizes and industries.

Lydia Pardun, University Scholar

Peter Campbell, mentor

The Socialization of Children into Militant Groups

Throughout history, militant groups implement systems to recruit, socialize, and deploy children as soldiers. This thesis analyzes children's socialization processes into the Hitler Youth and the Islamic State of Iraq and Syria. Using government and non-government organization (NGO) reports and historical accounts, it identifies the socialization process of each group then compares the two cases to establish identifiable patterns that lead children to become soldiers. The findings show larger socialization structure of the two groups are similar. Additionally, differences within each step of the process relating to the groups' geographic, cultural, and strategic needs.

Eva Parmenter, University Scholar

Daniel Nodes, mentor

A Liturgical History of the Holy Land and the Church of the Holy Sepulchre

When King David brought the ark of the covenant to Jerusalem it became a place sacred and central to the spiritual life of the Jewish people. The life, ministry, and sacrificial passion and death of Christ made Jerusalem sacred to the Christians as well and many central events in early Christian history occurred within its walls. In the fourth century A.D. a newly Christian Emperor Constantine built the Church of the Holy Sepulchre in Jerusalem so that Christian pilgrims could worship God in that sacred place where his death and resurrection occurred. Unfortunately, in the seventh century Islam conquered the Levant and desecrated the Christian sites including the Holy Sepulchre. It was under Islamic control until in response to the Seljuk empire's campaign of rapid conquest and expansion in the 11th century, Byzantine Emperor Alexios I asked in 1095 for the support of Pope Urban II who in turn recruited Christians for the 1st Crusade to reclaim the Levant and defend Christianity against the Islamic threat. The ensuing Crusader Kingdom of Jerusalem which lasted from 1099-1187 and from 1192-1291 was another epoch of central importance to the Judeo-Christian world and a historical nexus between Islam, Christianity, the Eastern and Western empires and the Roman and Orthodox churches. This place and this moment are of crucial significance not only for its impact on secular history but as a key moment in Christian salvation history. In this project, I will describe both the secular and the theological import of the history of the place but most centrally I will explicate the liturgy of the Holy City—the words, the rites, the art, the architecture, the whole work of the people for the praise of God in the most holy city of Jerusalem. These Jerusalem liturgies—pious, sacred, and spiritually efficacious—are model exemplars for Christian liturgical practice outside of their historical moment and I will argue for how they ought to inform our contemporary liturgical practice and worship.

Rachel Pierce, Baylor Business Fellow

Sara Perry, mentor

Illuminating the History and Hypocrisy of the Abortion Industry

The abortion debate is one on the front of the American mind today, especially with the Supreme Court hearing the case of *Dobbs v. Jackson Women's Health Organization*, a direct challenge to *Roe v. Wade*. Emotional defenses have been mounted to justify the "right to abortion," but these are simple distractions from the greater injustice of abortion. In this thesis, I will detail the legal foundation of the right to abortion, discuss the progression of *Dobbs v. Jackson Women's Health Org.* from the district court to the Supreme Court, and analyze pro-abortion arguments. I conclude with tangible steps for the pro-life movement to take in order to educate others, support women, and encourage American society to respect the dignity of life.

Elizabeth Plumer, University Scholar

Mikeal Parsons, mentor

Jesus the Great Physician – Healing Stories in the Gospel of Luke and the Implications for Modern Physicians

Jesus is often referred to as the Great Physician, and the Gospel of Luke presents a distinct picture of the healing miracles of Jesus Christ. This thesis will analyze the various contexts of magic, medicine, and miracle in which Jesus healed and taught. It will examine the interpretations and roles of magic, medicine, and miracle in a Greco-Roman, a Jewish, and a Christian context and further evaluate how it deepens the understanding of Jesus' healing miracles. This thesis will look specifically at the miracles of the epileptic boy, the bleeding woman, and the ten lepers within the Gospel of Luke and analyze these miracles within the spheres of magic, medicine, and miracle. The final chapter will then discuss the implications of Jesus' healing miracles for modern-Christian physicians and their healing and practices.

Lucy Potts, University Scholar

Maria Boccia, mentor

Siblings Improve Adult Psychosocial Health of Individuals Who Experienced Parental Divorce in Childhood

My research focuses on the impact siblings have on the psychosocial health of adults who have experienced parental divorce in childhood. Divorce is an Adverse Childhood Experience, or ACE, and has been associated with many negative health problems, such as strength of relationships, substance abuse, and chronic heart disease. This thesis uses data from a previous study and specifically analyzes how the presence and number of siblings affects adult health following parental divorce. Statistical analysis shows that siblings do have a positive impact on psychosocial functioning of these individuals, specifically impacting levels of mother and father care and indifference, comfort in relationships, and attachment style. This research is introductory and suggests that further study of the impact of siblings in divorced families would be beneficial as a potential buffer to the negative health effects associated with divorce.

Maria Pratt, Science Research Fellows

Bessie Kebaara, mentor

The Effect of Cadmium on the Growth and PCA1 expression in Saccharomyces cerevisiae strains with a functional and non-functional nonsense-mediated mRNA decay pathway

Regulation of gene expression at the messenger RNA (mRNA) level is vital for initiating a rapid and precise response to environmental stimuli. The Nonsense-Mediated mRNA Decay (NMD) pathway is a conserved physiological process in all eukaryotes that is involved in regulating gene expression. This pathway has been shown to target and degrade mRNAs that prematurely terminate translation and natural mRNAs that encode fully functional proteins. Regulation of mRNAs by NMD is specific to certain cellular contexts and environmental conditions. Importantly, the NMD pathway in *Saccharomyces cerevisiae* has an essential role in bio metal homeostasis, including a protein called *PCA1*. *PCA1* is an integral protein that transports metals and ions across membranes, specifically functioning as a cadmium efflux pump. Cadmium is a non-essential and toxic metal ion for eukaryotes, causing an imbalance of cellular redox, inhibiting DNA repair, etc. Therefore, it must be pumped out of the cell in order for it to function and grow. Here, I examined the growth of two yeast strains RM11-1 (with a functional *PCA1*) and W303a (with a non-functional *PCA1*) in cadmium to confirm the role of *PCA1* in the cell. I found that the strain with a functional *PCA1* was able to grow in cadmium, whereas the strain with a non-functional *PCA1* was not, confirming its role in the cell. I also sought to examine the accumulation of *PCA1* mRNA over time of one yeast strain with a functional and non-functional NMD pathway in the presence of cadmium. I found that *PCA1* mRNA accumulates to a higher degree in the yeast strain with a non-functional NMD pathway, hinting that NMD may play a role in its accumulation.

Autumn Purcell, University Scholar

Arna Bontemps Hemenway, mentor

Crestfallen: An Original Fairy Story for the Modern Age

In J.R.R Tolkien's essay *On Fairy Stories*, Tolkien outlines some of the key characteristics every good fairy-story should have. This manuscript explores the modernization of those traditional Tolkienian fairy-story concepts while incorporating successful fiction strategies which I discovered through my close examination of *The Lord of the Rings*, *Harry Potter*, and other fairy-stories. In my own fairy-story, a character closely resembling a modern college student explores the relationship between self-sacrifice and self-actualization, trying to ascertain the importance of memory in forming one's own identity. In the preface, I offer a contextualization of my manuscript by discussing its relationship to Tolkien's guidelines, the application of those ideas in *Harry Potter*, and the role of both in my work. In both manuscript and preface, I explore how Tolkien's ideas on fairy-stories may be subverted in a modern context without losing their essential truth.

Larry Qu, University Scholar

Jeffrey Forsche, mentor

Does the diagnosis of juvenile asthma influence the development of COPD later in life?

There is currently no identifiable cure for asthma and COPD, but it is known that exercise improves lung function in patients with these diseases. In fact, exercise prescriptions are often given to patients with these pulmonary disorders to improve lung function and increase force vital capacity. However, the risk of asthma exacerbation during exercise often discourages patients from being active, so patients with exercise induced asthma often exhibit poor fitness levels due to inactivity from a sedentary lifestyle. Inactivity can lead to several other health problems including obesity, which can also increase the probability of developing COPD. Currently, the literature illustrates a strong correlation between childhood asthma and COPD but it does not account for the lifestyle differences of those who developed COPD and those who did not. The present study attempts to elucidate the lifestyle adjustments, if any, that juvenile asthma patients can make to prevent the development of more serious lung conditions. The goal of this study is to determine whether playing competitive sports during youth in patients with asthma influences the development of COPD later in life (Age >40).

Noah Que, University Scholar

Eric Martin, mentor

Ethical Issues and Considerations within Non-Beneficial Pediatric Research

Non-Beneficial Pediatric Research (NBPR) is a form of research in which children are used as human subjects within experiments aimed at generating information and data that will potentially lead to the advancement of medicine for future generations. NBPR is distinct from traditional forms of pediatric research in that it does not inherently result in any direct benefit to the health of the child enrolled in the study yet introduces a level of risk to their health that would otherwise not have been experienced if the subject had not joined the study. Due to the nature of NBPR, certain issues related to risk and consent present ethical quandaries that must be considered to identify an ethical justification to continue this field of research. This thesis will thus provide a background and history of NBPR, consider the central issues related to this field, and analyze the current philosophical arguments that either defend or criticize the continuation of Non-Beneficial Pediatric Research.

Camille Rasor, University Scholar & Journalism

Julie Reed, mentor

How People and Communities Access and Receive Care Across the Country

In this creative thesis, I wrote six magazine-style journalism pieces that highlight the experiences of marginalized communities in America and their interactions with the health care system. Through interviews with people from around the country and reviews of data from public health entities such as the Centers of Disease Control and Prevention, I looked at varying topics from America's rise in maternal mortality to ableism in the health care system to the impact of the COVID-19 pandemic on Waco's communities of color. After writing these stories, I also photographed, designed and edited them into both a print and digital magazine. Through my work, I was able to better understand and share the health care stories of people not usually represented in media. In doing so, I brought into focus some areas in which the health care system might seek to improve patient/provider experiences and health outcomes for groups of people who experience among the worst levels of health care quality in the country.

Elizabeth Reesman, University Scholar

James Marcum, mentor

Effects of the Induction of Pyroptosis via Topoisomerase II Inhibition in Human Papillomavirus-Associated Vaginal and Oral Cancers on Antigen-Specific Immunity

Human papillomavirus (HPV) is the most common sexually transmitted infection worldwide, and infection with HPV may lead to several cancers. Topoisomerase II is overexpressed in HPV-positive cancers; thus, its inhibition may differentially target cancer cells. In certain cancer cell lines, topoisomerase II inhibition was found to induce pyroptosis—a Gasdermin-mediated form of cell death characterized by pore formation in cell membranes and release of cellular contents that may function as immunostimulants and neoantigens. This study sought to determine whether topoisomerase II inhibition induces pyroptosis in HPV-positive cancers and stimulates HPV-antigen-specific immunity. TC-1 and mEER cells, two established preclinical models of HPV-positive vaginal and oral cancers, respectively, were treated in vitro with two topoisomerase II inhibitors, etoposide and mAMSA. Western blotting was used to detect markers of pyroptosis. Splenocytes from mice given HPV-oncoprotein peptide vaccines served as sources of antigen-specific T cells and were cocultured with conditioned media from topoisomerase inhibitor treatments. Flow cytometry was used to analyze immune activity. Western blotting revealed the presence of markers of pyroptosis or immunogenic cell death in both cell lines treated with topoisomerase inhibitors. Flow cytometry analysis revealed some significant relationships in treatment with topoisomerase inhibitors and antigen-specific immune activation. The findings indicate that topoisomerase II inhibition may be a promising therapeutic option for HPV-positive cancers.

Brandon Reider, Biochemistry

Karol Hardin, mentor

Standardizing Proficiency in a Diverse Field: An Analysis of Linguistic and Cultural Indicators of Quality Care from Bilingual Physicians

As the population of primarily Spanish-speaking patients rises, physicians must adapt their language skills to provide quality care. Language-concordance, or the physician and patient speaking the same native language, is associated with more positive health outcomes. A lack of standardization in medical Spanish instruction and usage has led to negative health outcomes for Spanish-speakers in the US. This thesis summarizes current medical Spanish training and care, analyzes data from a bilingual residency track at Waco Family Medicine, and discusses how the results found could improve medical Spanish training programs. Participating residents completed formal

testing and self-estimated their own Spanish proficiency. Resident Spanish proficiency improved over the duration of the study. Self-estimation trends highlight the need to focus on intermediate-proficiency speakers who showed a higher tendency to over-estimate Spanish proficiency. By continuing this improvement and addressing physician overconfidence, graduating residents should be able to better care for their Spanish-speaking patient populations.

Katherine Rojas, Chemistry

Eric Martin, mentor

Formation in Science: A Cultural Exegesis of Scientific Research Practices

While many influential philosophers, sociologists, and anthropologists of science have theorized how science works to discover or construct truth, less work has been done examining how scientific practice forms scientists. As an alternative to the purely rational formulation of humans in the Western philosophical tradition, theologian James K. A. Smith argues that humans are fundamentally desiring beings whose loves are shaped and directed by cultural practices. Drawing from these conceptual frameworks and my firsthand experience in an inorganic chemistry lab, this thesis explores how the daily routines in a scientific research lab shape scientists' images of the good life. From washing glassware to writing in a lab notebook, the various practices comprising scientific research activity instill in scientists a complex constellation of values, including truth, purity, objectivity, order, and utility.

Morgan Russell, University Scholar

Patrick Flavin, mentor

A Pandemic of Skepticism: the relationship between COVID-19 conspiracy belief and unconventional political behavior in the United States

In response to the COVID-19 pandemic, many Americans have turned to COVID-19 conspiracy theories to make sense of the world. At the same time, the United States has faced an increase in unconventional political acts like destructive protests, law and mandate noncompliance, and events like the Capitol insurrection. Considering these trends, this study tests the hypothesis that belief in COVID-19 conspiracy theories increases one's willingness to commit unconventional political acts. Additionally, the study tests whether a causal relationship exists between general conspiracy exposure and unconventional political behavior. To test these hypotheses, I conducted a nationally representative online survey in the summer of 2021. In analysis, a series of regression models showed a statistically significant positive relationship between COVID-19 conspiracy belief and unconventional political behavior ($Beta=0.296$, $t=7.999$, $p<0.001$) even after accounting for possible confounders. These results suggest that the endorsement of some COVID-19 conspiracies increases one's willingness to commit unconventional political acts. Regarding the second hypothesis, T Test results from a survey experiment showed that conspiracy exposure does not directly cause an increase in willingness to commit unconventional acts for the general population. However, exposure does have a significant causal effect on some demographic subsets. These results suggest that unconventional political behavior is not influenced by simple exposure to conspiracy theories but a certain attitude towards them. The findings of this study ought to be considered when assessing ways to reduce dangerous conspiracy belief and political acts in the United States.

Resse M. Sarnowski, University Scholar

Walter Matthews, mentor

Interventions for Scoliotic Curves and Associated Spinal Deformities: A Context and Analysis of Novel Scoliosis Surgeries Over the Past 20 Years

Scoliosis surgery has seen significant changes and advances over the past two decades. The two surgeries performed around 2000 were non-expandable rod placement with full-fusion or fusion only at the rod anchor (2-3

vertebrae at top and bottom). In 2005, anchor-fusion growing rods that could be expanded were introduced, allowing for continued growth but requiring multiple subsequent surgeries, definitive fusion upon achieving full growth, and a complication rate from 17% to 40%. Additionally, motion is limited due to the either real or de facto fusion of the spinal apparatus. After 2010, laparoscopic tether-based surgery was introduced to allow growth with no fusion (VBT). In VBT, screws are placed horizontally through the vertebrae indicated in the curve, and a tether is run through the screws' heads and tightened to correct the curve. Correction further improves with growth. Later in 2015, surgeons performing tether-based surgeries began using an anterior semi-open approach (ASC) which allowed for secondary techniques to improve correction. Those techniques and the surgical approach made multi-staged and revision surgeries easier to perform while simultaneously reducing their necessity. Additionally, the possible candidate populations for ASC range from 7 years-old to over 50 versus 10 to 15 for VBT. Given the overall benefits of ASC relative to the other surgeries, it should be the first-line surgery for childhood and adolescent scoliosis.

Eric Shin, Biology

Nicholas Benson, mentor

No Child Left Behind Act: The Impact of Standards-based Accountability

What was the impact of the Standards-Based Accountability provision in the No Child Left Behind Act? SBA required states to produce a set of standards for standardized testing, and if these standards are not met, sanctions were imposed on schools. This was enforced through the Adequate Yearly Progress Report which was created under the NCLB. This thesis explores the impact of SBA implementation on the educational quality, notably teaching to the test and curriculum narrowing. Furthermore, SBA led to increased rates of test anxiety. This paper concludes by proposing recommendations to the accountability system and exploring the changes brought forth under the Every Student Succeeds Act.

Taylor Siebenman, University Scholar

Walter Matthews, mentor

People in the Pandemic: COVID-19's Effects on Socioeconomic Status and Health Inequities

Since the beginning of the COVID-19 pandemic, media outlets have been cluttered with information and opinion pieces regarding the coronavirus. Within this sea of information, it is imperative to acknowledge the effects that COVID-19 has had on socioeconomic status and the social determinants of health. Even as conversations regarding social distancing, lockdowns, and mask mandates fade away, many individuals and families will continue to battle the hardships created during the COVID-19 pandemic. This thesis will bring attention to how COVID-19 has affected socioeconomic status by viewing changes in financial stability, food insecurity, and access to healthcare during the early months of the pandemic. These patterns and hardships should be considered when evaluating support policies and planning for public health challenges in the future.

Kara Smeltzer, University Scholar

Christopher Rios, mentor

A Christian Ethic for AI? An Investigation of Statements from the Roman Catholic Church and Southern Baptist Convention

This thesis investigates the possibility of a distinctly Christian framework for how to design and use artificial intelligence (AI). It begins with an overview of AI including landmark events since its creation, current areas of application, and ethical questions that accompany AI. It then explores common views of AI and their ethical

implications. Next, it studies statements connected with two large Christian denominations, the Southern Baptist Convention (SBC) and the Roman Catholic Church. These documents outline each denomination's ethical framework for designing and implementing AI moving forward. All views investigated are then compared to one another. The conclusion considers the presence of a Christian view of AI. I suggest that Christianity provides specific boundaries for AI development and use that are not exclusive to the religion but rather can be agreed upon by a diverse community.

Mackenzie Smith, Biology

Austin Reynolds, mentor

Epidemiology and Genetic Correlates of Obesity Among a Rural Population of the Northern Cape Province, South Africa

In the past several decades, obesity has become a global issue, presenting significant consequences for individual health and the global economy. South Africa, like many developing nations, is experiencing rapid increases in BMI, particularly among urban populations. In this study, we analyzed the epidemiology of obesity of a multiethnic cohort from the rural Northern Cape of South Africa to determine if similar increases in BMI are occurring in rural areas of the country. We collected this data as part of a TB case-control study, with 435 healthy control participants included in our final sample. Linear models of BMI were generated using sex, age, education level, smoking, alcohol consumption, and diabetes as predictor variables. We also calculated odds ratios to understand the direct impact of epidemiological factors on risk of obesity. This was followed by a genome-wide association study to detect any single nucleotide polymorphisms correlated with obesity in this population.

Oluwatobi Soares, Biochemistry

Tamar Carter, mentor

*Determining the molecular mechanism of carbamate resistance in *Anopheles stephensi* in Dire Dawa, Ethiopia*

Malaria persists as a significant obstacle to public health around the world, sparking interest in methods focusing on disease vectors. Insecticide methods aim to lower rates of infection via mosquito vectors but have led to increases in insecticide resistance when utilized for long periods of time. Here, I investigate the correlation between carbamate resistance and the ace-1R mutation in the invasive species of *Anopheles stephensi* in the Ethiopian city of Dire Dawa and the biological relevance of the proposed area surrounding the mutation. Samples were exposed to carbamates to determine their resistance or susceptibility to each of the compounds tested. I selected 24 *An. stephensi* mosquitoes exposed to bendiocarb and propoxur. Tajima's D tested for selection among the resistant and susceptible populations. F_{st} values were used to evaluate if the genetic variation between them was influenced by demographic changes. None of the samples possessed the mutation, and the values for the Tajima's D analysis (-0.05 for resistant and -0.98 for susceptible) as well as the F_{st} analysis (-0.02 for ace-1 and -0.01 for COI) were not statistically significant. The absence of the ace-1R mutation, the lack of evidence of selection, and lack of genetic differentiation between resistance and sensitive mosquitoes suggest that the ace-1 gene is not a significant factor in resistance. Future studies should look at performing similar analyses in other Ethiopian sites and gene candidates, as well as investigating the possibility of genetic hitchhiking for the lack of significant differentiation between the two groups.

Noelle Sperrazza, Psychology

Hugh Riley, mentor

The Genetic, Environmental, and Sociocultural Factors in Eating Disorder Relapse, and Opportunities for Prevention

Eating disorders rank among the top 10 causes of disability among women, thereby emphasizing the profound impacts of bulimia and anorexia nervosa on both the female population and society as a whole. Their etiology shows support for a combination of genetic, environmental, and sociocultural factors in the development and maintenance of the mental disorder(s). Fewer studies have explored, however, the circumstances under which one might be prone to relapse, as opposed to a full recovery post-treatment. In this literature review, the nature versus nurture debate highlights some of the hereditary and acquired risk factors for eating disorders (Mazzeo et al., 2009), as well as their impact on levels of severity (Horesh et al., 2014). Treatment techniques such as stepped-care models of intervention, cognitive-behavioral therapy (CBT), and family-based therapy (FBT) vary by type of eating disorder (Bailey et al., 2014); however, research pertaining to the extent of their promise and long-term effectiveness must be further investigated. Findings reveal that 20% to 50% of those with eating disorders will suffer from relapse (e.g., Bailey et al., 2014; Keel et al., 2005), but predictors of this must continue to be explored. Risk factors leading to relapse seem to point toward 1) the extent of body image disturbance as well as 2) overall worse psychological function, but such findings require further support.

Brigid Splaine, Political Science

Julie King, mentor

Something in the Water: Policy Analysis of the Biden Administration's Environmental Justice Plan and Its Impact on Drinking Water Inequality in the United States

Since the water crisis in Flint, Michigan, a resurgence in discussions concerning the drinking water quality in the United States has taken place. Yet, what many Americans failed to realize is that Flint is not the only community in the United States struggling with drinking water quality. There are hundreds of communities like Flint every year, but poor drinking water quality disproportionately affects certain communities over others. These environmental justice communities bear the highest burden caused by America's failing drinking water infrastructure. The Biden Administration has proposed a plan, which they will use to enact specific policies and promote legislation that directly focuses on environmental justice concerns. Implementing these specific policies outlined in the Biden Administration's plan could help to effectively resolve the ongoing drinking water issues in the United States while also working to address environmental justice concerns.

Pranav Sreekumar, University Scholar

Joaquin Lugo, mentor

The neural mechanisms of Alzheimer's Disease and Acquired Epilepsy: An investigation to understand whether an overlap of mechanisms exist between these two disorders

Alzheimer's Disease (AD) and acquired epilepsy are neurodegenerative disorders that have impacted millions of people's lives around the world. Understanding the pathologies involved in these diseases is very important in the field of medicine. Researchers have looked to understand the causes and symptoms of these disorders from a biochemical and molecular standpoint. Moreover, researchers and physicians have strived to develop therapeutics to combat disease progression and reduce symptoms. However, few articles have delved deeply to identify whether these disorders share a common neural mechanism. This literature review will look to understand the neural mechanisms involved with AD and acquired epilepsy and identify whether an overlap of mechanisms exist between the two disorders. By identifying whether an overlap exists between these diseases, researchers can investigate future therapeutics that target both pathways.

Kathryn Stepek, University Scholar & Political Science

Patrick Flavin, mentor

Does Electoral System Contribute to Party Polarization in European Democracies?

This study examines the relationship between electoral system and party polarization through both a qualitative case study of the United Kingdom, Germany, and Switzerland and a quantitative regression analysis of twenty-two democratic countries. The first part of this study analyzes this relationship through an analysis of the frequency and quality of the instances in which each party references the political opposition via party platforms, speeches, and news reports. The United Kingdom and Switzerland appear to have the higher levels of polarization and Germany appears to have the lowest levels of polarization of these three cases. The second part of this study consists in multiple linear regression analyses, using both Reiljan and Dalton's polarization indexes to determine whether there is a significant relationship between electoral system and affective polarization levels. Counterintuitively, this study concludes that there is no such statistically significant relationship. These conclusions suggest that electoral system does not necessarily affect polarization in established democracies.

Claire Griffis Sullivan, Recreation and Leisure Services

Thomas Spitzer-Hanks, mentor

Re-creating Outdoor Recreation: An Exploration of the Wilderness Within and Around

This thesis used a collection of landscape and abstract paintings alongside a series of creative writing pieces by the author to explore outdoor recreation in an auto ethnographic format. The second half of the thesis utilizes a series of discussions between the author and the thesis advisor to explore decolonization theory to address how we can create a more authentic experience in outdoor recreation for a multitude of people.

Amanda Sutton, University Scholar

Jennifer Good, mentor

Language and Cultural Barriers in the United States Healthcare System

This Honors Thesis aims to examine and address the insufficient provision of language accommodation services for non-English-speaking patients and patients with limited English proficiency seeking care in the United States, as well as to provide suggestions to mitigate the issue. First, I relay stories of documented instances in which language barriers have led to negative outcomes for patients and derive from these stories a list of the greatest challenges associated with the presence of language barriers in U.S. health care. Next, I provide an overview of the current standards and laws at the federal and state level associated with language accommodation in healthcare settings to provide readers a glimpse into the United States' current status in response to the issue. Then, I present a comparison study comparing the United States to Australia, a country with an advanced system of language accommodation services from which the U.S. can learn. Finally, I review suggestions, recommendations, and steps that the United States can use to improve its current system of language accommodation services in healthcare settings.

Brandon Swinney, University Scholar & Philosophy

Todd Buras, mentor

Is It Reasonable to Be an Interactive Substance Dualist in Light of Arguments From Neuroscience and Philosophy?

Physics, biology, and neuroscience have grown to describe the world with astounding success. As philosopher John Searle notes, this leaves us with a question: where do we fit into this picture? Beginning with Descartes and running up to now, questions about the nature of the human mind have morphed to include modern scientific

discoveries, namely those from the fields I just mentioned. In this thesis, I look at recent neuroscientific arguments against dualism and personal causation, weighing them to decide whether interactive substance dualism is still a reasonable position to hold. I conclude that the relevant neuroscientific studies are ridden with unreasonable data interpretations and generalizations, and that they do not even diminish the rationality in holding interactive substance dualism. I then introduce and look at the more general scientific consensus-style argument for the causal closure of the physical. I argue that based on the current state of physics, we have little reason to believe the physical world is causally closed. Lastly, I argue that the most common alternative to dualism, materialism, is possibly epistemologically disastrous. This thesis ultimately shows that the strongest arguments against interactive substance dualism fail to go through, and that we in fact have good reason to be dualists of this kind today.

Matthew Tateossian-Zortian, University Scholar

Jeffrey Hunt, mentor

An Investigation of Music as a Response to Grief

Music is a gift from God. It can be used to express a wide range of emotions, from joy to despair. Music is particularly helpful in processing the complex and difficult emotions that come with the death of a loved one. This thesis will investigate three examples of this. First, I examine how David, a skilled artist, poet, and composer in the ancient world, expresses grief over the losses of loved ones in his life. Then, I discuss how Jimmy Greene, modern composer and jazz musician, came to terms with the tragic loss of his daughter in the Sandy Hook Elementary School shooting. Finally, I present one of my own compositions, an arrangement of Be Thou My Vision for violin and piano, written in memory of my friend David Grotberg. My arrangement was played privately for his parents during a time of remembrance and celebration of his life.

Ashlyn M. Thompson, University Scholar

Alexander Engebretson, mentor

The Only Hope, or Else Despair': Disenchantment in T.S. Eliot's The Waste Land and Four Quartets

Countless theologians have debated the nature of spiritual meaning within the corporeal realm, with many defending the world's inherent, sacramental character as the bridge between the spiritual and material. Theories of this *enchantment*—the infusion of the ordinary, physical world with spiritual value that elevates it to the status of the Lord's reflection in creation—are discussed in the writings of Max Weber and Eugene McCarragher, whose ideas are developed and corrected in two of T.S. Eliot's poetic works. *The Waste Land* and *Four Quartets*, written nineteen years apart, span Eliot's journey into Christianity, as well as following the progress of his own, implicit view of enchantment. In this paper, the beliefs of Weber and McCarragher are examined before introducing Eliot's own theory through a deep analysis of both poetic works. Following this analysis, the ramifications of his own conclusion are observed through the lens of modern society.

Pierce Thompson, Biology

Dwayne D. Simmons, mentor

Affect of Oncomodulin on Afferent and Efferent Cochlear Synaptopathy

Inner hair cells (IHCs) are a type of specialized sensory cell which converts the pressure gradient of the endolymph into an interpretable signal, allowing for hearing. However, there is another type of sensory cell crucial for hearing: outer hair cells (OHCs). OHCs amplify basilar membrane motion through the movement of prestin, a voltage-sensitive motor protein, resonating with its respective tonotopic frequency. The medial olivocochlear (MOC) system is part of the auditory system which synapses on OHCs with cholinergic receptors, acting antagonistically to prestin by hyperpolarizing the cell, resulting in cochlear acoustic protection through a calcium dependent

mechanism. Loss of function of the MOC system has been shown to precede progression of age-related sensory deficits, but the correlation between the loss of function of the MOC system and OHC vitality is yet to be examined. This paper will examine the correlation between OHC vitality, efferent MOC synapses, and afferent glutaminergic synapses.

Carlie Toliver, Music Performance

Bradley Bolen, mentor

The Correlation of Music and Memory in Alzheimer's Patients and Edvard Grieg's Lyric Pieces

There have been many studies on how music can affect memory, especially in the context of memory care patients, as well as how musicians understand the concept of memory. The first chapter of this thesis discusses how musicians perceive memory, such as memorization strategies they use when learning music. The second chapter focuses on how memory care patients relate to music. It places an emphasis on discovering what types of music elicit the most response and possible reasoning behind the relation of the specific genres to their memories, specifically when related to memories from childhood. The final chapter looks at four specific examples of a composer using memory-like concepts in Grieg's *Lyric Pieces*. It details how certain phrases within the pieces relate to remembering the past as well as remembering back to other phrases or melodic ideas in the pieces.

Xana Toth, University Scholar

Lindsey Camp, mentor

A New Perspective in Awareness: How Families with Special Needs View Themselves and Want to be Viewed by Others in Their Family Unit and Society

There is much research devoted to gain awareness of individuals and families with special needs. However, research is lacking on the eclectic voice of the special family for how they themselves view awareness. This study presents a qualitative questionnaire to individuals with special needs and their family members to gain a new perspective of awareness that is derived from the point of view from the whole family unit: parent, sibling, and self. This perspective is heard altogether, rather than in separate studies. In the responses received by four participants, four themes were found in what is needed to obtain awareness from other family members and society: communication, closeness, advice, and advocacy. Each of these factors work together to show what it means to be more fully aware of these families and the lives they live both within and outside of their immediate family unit. Further, the findings have larger implications within the family interpersonal relationships and societal implications.

Faith VanVleet, University Scholar

Julie deGraffenried, mentor

The Politics of Memory and Nationalism in Contemporary Poland

Since 2017, Communist monuments in Poland have been disappearing from across the country. Behind their removal is the policy of the Polish Law and Justice administration carried out by the Institute of Historical Memory (IPN), a highly centralized organization with extensive power over memory politics. This thesis argues that Poland's government engages in the politics of eternity, a term from scholar Timothy Snyder's book, *The Road to Unfreedom*, by using memory policy to portray Poland as at the center of a cycle of victimhood. The next chapter examines how the IPN supports this narrative through the production of educational and popular culture media that problematically compare Poland's experience of World War II to the Communist era. The thesis then engages in a case study of two monuments, the Monument to the Revolutionary Act in Rzeszów, Poland and the Monument to the Soldiers of the Soviet Army in Warsaw to delve into the differences in adaptability surrounding controversial historical monuments. The final chapter discusses how the Polish monument controversy might shed light on American controversies over Confederate monuments.

Austin M. Varghese, Biology

Jeremy Vickers, mentor

Universal Free Meals: The Effects on Student Participation and Academic Achievement on Low SES Hispanic Students at Waco ISD

Universal access to free school meals is accessible through the Community Eligibility Provision (CEP) established by the U.S. Department of Education nationwide in 2014. The option allows schools and local education agencies in high-poverty regions to provide free breakfast and lunch to all students during the school year. The policy reduces local administration burdens by eliminating students' annual recertification in need of free meals. In addition, it provides easier access to nutritious meals for low-income students, therefore, incentivizing participation, increasing program revenues, and decreasing the stigma associated with participating in school meal programs. The novel program's goal is to reduce childhood hunger, food insecurity, and poverty in the United States. Many programs like Supplemental Nutrition Assistance Program (SNAP) have significantly impacted by improving long-term health and economic outcome. When students see nutritional improvements, schools have found fewer school absences. A healthy, balanced diet is reflective of a student's academic success. Hispanic students account for the most significant and fastest-growing population in school enrollment, especially in Texas, but are more likely to live in poverty. This research primarily assesses how the CEP for free breakfast and lunch positively impact reading scores of low SES Hispanic third to fifth-grade students attending Schools at Waco ISD. The CEP policy was enacted during the 2018-19 school year (SY); therefore, the goal is to provide a comparative case study of how the CEP has affected Waco ISD elementary schools.

Trisha Venkat, Biochemistry

Devan Stahl, mentor

Three Virtues to Guide Surgical Practice

In this work, three virtues, proper pride, compassion, and practical wisdom, are assessed in their functionality for surgeons. It is technically possible to perform surgery without having virtues, but virtues allow for a surgeon and their patient to flourish. Proper pride is the knowledge of the extent of a surgeon's skills and their ability to use their knowledge for the benefit of others. Proper pride is defined by Aristotle, an ancient Greek philosopher, and the cases handled by John Hunter, the first modern surgeon, are examined. Compassion is cosuffering with a patient and making treatment plans that better the patient and their quality of life. Compassion is defined by Edmund Pellegrino, a physician and medical ethicist, and the work of Henry Marsh, a British neurosurgeon, is studied. Practical wisdom is the deliberation that leads to the best possible plan for the patient based on the knowledge, virtues, and experience of a surgeon. Practical wisdom is defined by Aristotle, and the experience of Atul Gawande, a general surgeon in Massachusetts, is analyzed. These three virtues provide the parameters that push a surgeon to take decisions that benefit their patient and better their relationship with their patient, causing both the surgeon and their patient to thrive.

Anne Walker, Economics & International Studies

Richard Jordan, mentor

Indonesia's Grand Strategy

As China's rise threatens the Indo-Pacific, Indonesia aspires for regional leadership. In this thesis, I explore Indonesia's grand strategy and how it will adapt to the mounting tensions in the Indo-Pacific. Based on officials' policies, rhetoric, military responses, and diplomatic engagements, I analyze Indonesia's Indo-Pacific strategy and Global Maritime Fulcrum (Fulcrum) strategy. I then evaluate how these strategies fulfill their ambitions and predict how they will evolve in response to the Sino-American rivalry. I argue that Indonesia's reliance on ASEAN undermines its current Indo-Pacific strategy, which Indonesia will eventually replace with more traditional

counterbalancing. After assessing the Fulcrum strategy, I conclude that Indonesia will rely on the Fulcrum to extract financial benefits from the US-China competition until soliciting investment from China endangers its strategic autonomy.

Katherine Walton, Baylor Business Fellows, Finance, Economics & Risk Management and Insurance

Mike Stegemoller, mentor

Corporate Virtue Signaling: The Devolution of Virtue into Signaling

This paper examines the complex phenomena of corporate virtue signaling, tracing it through the roots of Aristotelian virtue and evolution during the growth of utility theory, increased focus on economic wealth, and conflicting views on the purpose of a corporation. As virtue signaling becomes a staple in corporate publicity, the phenomenon warrants examination of if it is truly virtuous, aligns with corporate objectives, and fosters social benefits. Corporate virtue signaling lacks essential requirements of true virtue, but on a case-by-case basis signaling can provide, or fail to provide, useful benefits to corporations and society. While a consistent and intentional corporate signaling strategy is most likely to be successful, the private and public gains associated with corporate virtue signaling are not guaranteed. Signaling is a double-edged sword able to harm both companies and the public through poorly executed campaigns. The increased focus on stakeholder objectives may point to stakeholder theory itself being a virtue signal that can insulate executives from claims of mismanagement, increasing their ability to serve themselves rather than stakeholders and shareholders. Additionally, the analysis of virtue compared to the corporate signaling trend prompts the consideration of what people can and should expect from corporations.

Hannah Camille Watson, University Scholar & Professional Writing and Rhetoric

Greg Garrett, mentor

The Grafted Culture: An Autobiographical Insight into MK Life

This creative thesis is an autobiographical memoir of my life growing up as a Missionary Kid (MK) in Ukraine, Russia, Oregon, and Germany. The purpose of this project was trifold: first, to introduce the reader to the culture of MK's, uniquely shaped by our parents' culture and the cultures we grow up in; two, to showcase how the unique cultural experiences of all MK's affects our fundamental concept of identity and what it means to be human; and three, to demonstrate both the benefits and drawbacks that result from growing up in this unique combination of contexts. My hope for the reader is that you find yourself invited into experiencing a new culture and perhaps even learn something new about yourself in the process.

Claire Wubben, University Scholar

Jennifer Hargrave, mentor

Restricted Political Ability: How Nineteenth-Century British Women Novelists Worked to Influence Their Societies Through Their Novels

There is a pattern in nineteenth-century Britain that only exists within novels written by women. Throughout the century, the topical scopes women writers chose from grow smaller as the popularity of the novel increases. Shrinking from conversations encompassing Britain's international empire, to the effects of the Industrial Revolution on the working class, to the importance of morality in the home, each topic is approached by the authors with the same intent of including women in the overarching socio-political conversation of the day. This thesis seeks to fill in the nineteenth-century women's political perspective through a discussion of the works and writing styles by Frances Burney, Mary Shelley, the anonymous author of *The Woman of Colour*, Elizabeth Gaskell, George Eliot, Charlotte Brontë, and Charlotte Yonge. Their works are put in conversation with the politics surrounding their publication, and it is possible to see how they impacted their contemporary societies.

Matt Young, University Scholar

Edward Taylor, mentor

The Grandeur of God: A Musical Setting of Gerard Manley Hopkins' St. Beuno Sonnets

The poetry of Gerard Manley Hopkins is rife with musical qualities; from his unusual “sprung rhythm” to the influence of the Welsh poetic tradition of *cynghanedd*, his works often “pour and pelt music” (“The Sea and the Skylark”). These elements have engendered many musical adaptations of Hopkins’ poetry, but such compositions rarely reach a large scale. In this creative project, I aimed to capture the musicality and meaning of Hopkins’ poetry in an eleven-piece cycle of piano works, each one the setting of a different sonnet written by Hopkins in the summer of 1877 while preparing for ordination at St. Beuno’s College. To this effect, I have adopted an original method of musical interpretation, drawing inspiration from both prosody and semantics to create instrumental melodies that follow the poetry closely, adapting each word of the text. The final project includes the compositional score in addition to an explanatory document that situates the work within the landscape of musical history—explicating the work’s many influences—and details many of my artistic choices in the compositional process.

