
ABSTRACTS OF THESIS PROJECTS
SPRING 2023
Honors Program & University Scholars



Baylor University
HONORS COLLEGE

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Laxmisanjana Ade, Neuroscience

Elizabeth Corey, mentor

Neuroscience in the Courtroom: Exploring How Science Can Help Create a More Comprehensive Legal System

In the past few decades, neuroscience has emerged as one of the fastest-growing fields of study, providing increasingly precise insights into the workings of the brain. With improved imaging and analytical techniques, research has focused on how to best apply the information to different fields. Neurolaw, an interdisciplinary field, seeks to understand how neuroscience can inform legal decision-making, and how legal principles can shape the use and interpretation of neuroscientific evidence. Neuroscience can help inform the neural basis of culpability, criminal responsibility, and mental capacity through understanding the neural underpinnings of human behavior. As neuroscience and the law continue to intersect, the ethical, legal, and social implications come to light. The integration of neuroscience and the law has the potential to enhance the comprehensiveness of the American legal system through the law, legislation, and policy.

Austin Aiken, Supply Chain Management

Robert Miner, mentor

Authenticity: Nietzsche's Antidote to an Era of Fear

Nietzsche suggests that morality is not a science where there is a discernable answer that is universal and consistent across time. Instead, he suggests that man must contribute his own creative conscience to live rightly. While Nietzsche does not actually use the word authenticity, his writings serve to support this ideal. He does this by contrasting a type of docile, weak person, a bound spirit, who lives an inauthentic existence, to his free spirit, who lives authentically, breaking away from the conventions of his culture and artfully defining values for himself in the process of self-becoming. This process requires an undying commitment to honesty with oneself, although it does not necessarily mean being sincere with others. This ideal offers salvation from the ills of a weak and dying culture, dominated by fear.

Dominic Alioto, Baylor Business Fellows & Economics

Michael Richards, mentor

Measuring Changes in Advertiser Purchases from COVID-19 Stay-At-Home Policies

During the spring of 2020, life across America changed as schools, colleges, and businesses shut down to slow the spread of COVID-19. Millions were required to cease all activities and follow the state-mandated stay-at-home (SAH) orders. In lieu of other options, many turned to the classic American standard of entertainment: television. This paper aims to measure changes in advertisements throughout these lockdowns. However, as the reader likely knows, not all states engaged in such strict regulation of COVID. This provides a prime opportunity for a difference-in-differences regression, with states that enacted SAH policies serving as the treatment group and those that did not as the control group.

Clement Aniekwena, Biochemistry

Dwayne D. Simmons, mentor

Postnatal Cochlear Synaptic Innervation Relative to Frequency

The physiology of hearing is an essential function to humans as it strongly contributes to survival and lifetime experience based on its quality. Although environmental factors may strongly influence our quality of hearing, evidence suggests that factors derived from birth play a role in the long-term response from environmental influence on hearing physiology. Within the cochlea, the spiral shaped bony organ for human hearing process, sound via vibrations through the oval window located at the base of the cochlea, initiating Mechanoelectrical Transductions (METs) throughout the spiral. Upon activating these METs, both afferent and efferent neurons are activated and sent to the brain for a signal depending on the intensity of the response and the location of the neuron. Since the sound wave first enters the cochlea at the base of the cochlea, we hypothesize that the hair cells at the base of the cochlea will form more efferent neurons during development as an enhanced effort for the preservation of hair cells located at base due to higher activity; Additionally, having a higher presence of calcium channels to monitor the movement of calcium (linked to cellular response).

Tyson Arnold, University Scholars

David Smith, mentor

The Integration of Baseball from the Perspective of Negro League Baseball Owners

Summary of research: My research explores the well-known narrative of Jackie Robinson and other black baseball players breaking baseball's color line. This thesis tells that story, not from the perspective of Jackie Robinson or the owners of MLB teams, from the perspective of the owners of Negro League Baseball teams. My research looks at records from league meetings throughout the 1940s and 1950s and weaves in biographical information about the men and women who built one of the largest and most profitable black institutions in America.

Elise Baldwin, University Scholars & Professional Writing and Rhetoric

DeAnna Toten Beard, mentor

'The plan is to fan this spark into a flame': A Literary and Historical Approach to Teaching the Contemporary Musical Hamilton in High School English Classrooms

The high school English curriculum is currently constrained by literature that often lacks diversity, cultural and social significance, and artistic merit. The underutilized genre of musical theatre offers significant opportunity for students to engage with the written, aural, and visual components of a show. Contemporary musicals aim to break the bounds of theatre arts inviting reflection and conversation surrounding new, and sometimes controversial, themes. Lin-Manuel Miranda's *Hamilton: An American Musical* (2015) re-mythologizes the American story proving its worth as dramatic literature for use in the classroom through its inspiration towards inclusion, emphasis on the power of the written word, and complex characterization. By merging hip-hop, musical theatre, and history, Miranda is able to appeal to a wide audience while challenging what we know about history and storytelling. This thesis explores the history of the musical genre and argues for the integration of musical theatre within English classrooms as a form of dramatic literature through the use of Miranda's *Hamilton* as an example, by way of sample course curriculum designed around the show.

Rahul Banka, University Scholars

Lorin Matthews, mentor

Studying Complex Plasmas Through Computational Modeling

Plasma is an ionized gas comprising ions, electrons, and neutral gas atoms. When particles, usually between nano- to micro-meter in size, are immersed in plasma, a complex plasma is created. Complex plasmas are ubiquitous as they can be found in various astrophysical and terrestrial contexts such as planetary rings, fusion reactors, and plasma etchers. While much work has been done experimentally to observe and understand complex plasmas, it is often difficult to have a complete view of the underlying physics due to the small scales at which plasma interactions occur. As such, computational models are utilized to simulate complex plasmas. This thesis presents three such models. First, a model that simulates crystalline structures formed in plasma is described and used to study the effects of experimental conditions on the stability of these structures. Next, a model used to track dust trajectory in fusion plasmas is described, and its results are validated against an accepted model. Lastly, a model simulating the dynamics of an ion is utilized to study the ion wake and its characteristics.

Caroline Barnett, University Scholars

David Corey, mentor

A New Communion: Reimagining Political Progressivism as a Religious Phenomenon

The scholarly conversation regarding the overlap between religious and political institutions is extraordinary in scope, but contemporary behaviors associated with American progressive liberalism and their relation to the rituals of the Christian tradition have received relatively little academic attention. This thesis compares communal phenomena such as origin mythology, “cancel culture,” “wokeism,” and Twitter to their counterparts within the Christian Church, including excommunication, revelation, and catechesis. The works of Carl Schmitt, Eric Voegelin, and Molly Brigid McGrath provide the style of examination that guides these comparisons. Through its investigation, this thesis functions as an insightful thought experiment to shape further academic inquiry into the nature of American political conflict and its potential solutions.

Ethan Barton, University Scholars

Deirdre Fulton, mentor

The Annals of the Ancient World: An Argument for Historical Antiquity in Genesis

The chronological work of Archbishop Ussher was fundamental in instigating New Earth Creationism, which holds that, according to Scripture, the world is only a few thousand years old. In this thesis, I argue that Ussher’s dates for pre-Abrahamic events are wrong and that, contrary to the claims of New Earth Creationism, the text of Genesis allows for and even implies a very ancient universe. I argue this by offering two textual examinations that seem to advocate for non-traditional interpretations. First of all, the genealogies from Adam to Abraham are very likely more symbolic than historiographical; the names tell the politico-geographical story that culminates in Abraham rather than representing individual people, and thus the text rhetorically condenses a long antiquity down to about 2000 years. Second of all, the creation story in Genesis 1:1-2:4a uses function-oriented terminology and develops a function-oriented metaphor, suggesting that the text describes the functional ordering of the universe out of chaos and not its material origins. I thus conclude that Scripture offers no indication of the date of creation, but indicates only that it was a far longer time ago than New Earth Creationists would believe.

Sinchana Basoor, Biology

Dwayne D. Simmons, mentor

Ca²⁺ Dysregulation Affects Mitochondrial Stress and Morphology in Outer Hair Cells

The normal function of outer hair cells (OHCs) of the cochlea requires a delicate regulation of calcium (Ca²⁺). Prolonged excessive noise and aging can disrupt this regulation and result in oxidative stress. Oncomodulin (OCM) is the prevalent calcium-binding protein in mammalian cochleae and its presence may moderate the damage caused by injurious stimuli, such as noise. Mitochondria play a central role in oxidative stress and can show signs of stress through changes in their morphology. We hypothesize that a lack of OCM or noise exposure results in distinct changes to the mitochondrial networks of OHCs which may contribute to their dysfunction prior to cell death. To test this, distortion product otoacoustic emissions (DPOAE) assays on wildtype mice and mice lacking OCM were performed to assess hearing ability. Immunofluorescence was performed on cochlear sections to label mitochondria and OHCs for morphology analysis using Imaris. Results from these preliminary experiments show that OHCs from mice exposed to noise or lacking OCM exhibit increased hearing thresholds and changes in mitochondrial morphology.

Kaylena G. Berles, University Scholars

Matthew Andersson, mentor

An Examination of the Black-White Mental Health Paradox

Despite facing lower socioeconomic status and greater environmental stress, Black Americans exhibit more robust mental health than their White counterparts. This surprising relationship between race, socioeconomic status, and mental health rates has been documented and labeled as the Black-White mental health paradox. Though many hypotheses have been proposed, the reason for this paradox is not fully known. Perhaps some of these theories of mediating variables have merit, or perhaps the paradox is brought about by healthcare disparities. This thesis seeks to delineate current proposed explanations of the paradox and to examine ways in which culture and access to healthcare may be influencing the paradox. Both religiosity and self-esteem prove notable in their ability to mediate the paradox, and identification with a cultural group has the ability to affect both of these factors. Given the complexity of the paradox, further investigation is needed to determine how these variables interact with each other and influence racial variation in mental health.

Sam Black, University Scholars & Film and Digital Media

Maverick Moore, mentor

Funeral Games for Fredrick: an Odyssey of Life, Death, and Classical Studies

Funeral Games for Fredrick is a feature-length dark comedy screenplay. Fredrick Stevens is a kindhearted, beloved, and (most importantly) deeply obsessive Classics Professor. He has been known to slip into ancient dialects during class, stage mock-Trojan-wars with his students, and collect a variety of ancient weaponry replicants—that is, until he was hit by a bus. Shortly after his death, it is revealed that, in lieu of an average funeral, he has requested in his will to be burned on a traditional Ancient Greek funeral pyre—a request that will seemingly not be possible to meet. However, Fredrick's two closest colleagues and a student they share steal his corpse and drive it across the country in hopes to burn Fredrick with honor and, in turn, find peace within themselves. This creative thesis, written in a feature-length script format, will explore themes of death, regret, and personal identity.

Caroline Bradley, University Scholars

Meghan DiLuzio, mentor

The Saturnalia: An Analysis of Religious Ritual and Family Relationships

Festivals in the Roman Empire were more than religious events; they had social implications for the city, the neighborhood and the nuclear household. Members of the household experienced these festivals in different ways based upon various social factors, including gender, social status and slave status. The interactions among household members during the festivals served to confirm relationships and aspects of social identity, and encouraged the fixed standards associated with one's position in society. This thesis looks specifically at the Saturnalia, a Roman festival celebrating Saturn that also served to solidify the segregation of status between slaves and masters. In order to specifically analyze this festival and its impact on the Roman household, this thesis begins by establishing the importance of religion and physical space, and transitions into looking at the impact on each member of the household with a specific emphasis on the male master of the household, the master's wife and a household slave.

Rachel Brown, University Scholars, Professional Writing and Rhetoric, & Philosophy

Kristen Pond, mentor

The Coming Woman: A Study of Idealized, Secondary Female Characters in Victorian Novels

Most idealized, secondary female characters in Victorian novels are disliked and disregarded by readers because they are deemed too good, unrelatable, flat, or unimportant. As soon as readers realize these characters are idealized, readers assume they represent the typical Victorian ideal of the "angel in the house" and dismiss them. However, if read more closely and studied more carefully, readers will realize that these characters often represent a different kind of ideal that more accurately represents who women are and what they are capable of: the coming woman ideal. By analyzing Agnes Wickfield, Helen Burns, and Mary Garth as full-fledged characters, one can realize how these characters who embody the coming woman are worthy of study and appreciation in and of themselves and because they help readers better appreciate the authors, other characters, and the novels themselves.

Leah Bullinger, Psychology

Wade C. Rowatt, mentor

Insufficient Sleep Across Race Groups Over Time

Insufficient sleep can negatively impact individuals on social, academic, medical, and societal levels. However, there are gaps in the literature regarding the relationship between sleep averages and same-race groups across time. This study assessed the relationships between same-race age groups and reported sleep scores in a national sample. Data (n=2,185) was collected from five waves of The National Longitudinal Study of Adolescent to Adult Health (Add Health). Data analysis showed that reported sleep averages decreased across all five waves for almost every cohort (from 7.93 hours to 6.72 hours). Furthermore, the data showed that Whites tended to report higher sleep score averages than Hispanics, while Hispanics tended to report higher sleep score averages than 'Other' race members and Blacks. In the end, over two thousand participants' responses were considered, and bivariate correlations revealed that all significant effect sizes were rather small. These results suggest that the connections between sleep insufficiency, race, and age group are deserving of further investigation.

Susannah Bumstead, University Scholars

Wade C. Rowatt, mentor

The Impact of Exercise and Sleep on Posttraumatic Stress Disorder Symptomology in U.S. Military Veterans

As more continues to be learned about the impacts of trauma, new and innovative ways to treat trauma and Posttraumatic Stress Disorder are at the forefront of research. Although CBT and other therapies are the recommended treatments, certain lifestyle changes, such as sleep and exercise, have proven efficacious in treating trauma. This study seeks to understand the relationship between exercise, sleep, and PTSD symptomology utilizing a data set collected at The South Texas Research Organizational Network Guiding Studies on Trauma and Resilience among U.S. military veterans. Data analyses revealed that exercise and sleep predict changes in PTSD symptomology experience alone and together at certain time points. In a mediation analysis, there was a total effect between exercise and PTSD through sleep quality, but there were no direct or indirect effects. Although the relationship between the three is complicated, PTSD symptomology was significantly affected by increased exercise and improved sleep quality.

Benjamin Buras, University Scholars

Yoav Isaacs, mentor

Fine Tuning in light of Multiverse Confirmation

Certain fundamental physical attributes of the universe are finely tuned to support life. Fine tuning for life is extraordinarily unlikely given random chance but substantially more likely given the existence of a God. The fine-tuning argument framed with Bayesian epistemology, claims that because fine tuning for life is more likely given the existence of God, the existence of God receives relative confirmation over atheism. While many objections to the fine-tuning argument fall short, the multiverse objection successfully denies the premise that fine tuning is unlikely by asserting that there are many universes with varying fundamental physical attributes. Isaacs, Hawthorne, and Russell (2022) offer a compelling argument that fine-tuning for life provides relative confirmation for a multiverse given any standard method for updating priors on self-locating evidence. In response, I argue that strong multiverse confirmation does not render the fine-tuning argument for theism obsolete. I show that fine-tuning still provides relative confirmation for theism over single universe atheism. Furthermore, I show that under at least one of the leading theories of self-locating epistemology, fine-tuning in multiple universe atheism also confirms a massive sprawling multiverse that introduces serious skeptical concerns for atheism.

Spencer Burress, Political Science

Andrew Clayton, mentor

“Put Not Your Trust in Princes”: Modern America’s Idolatry of Politics and The Gnostic Qualities of the Great Awakening

This project traces the historical and spiritual causes of the religious fervor with which twenty-first century Americans engage in politics. After making observations about declining rates of traditional religious worship and belief in God, I devote time to identifying and defining the forms of “political idolatry” that have crept into American politics in recent years, among which are LGBTQ+ activism, New Racialism, Obsessive Environmentalism, and Trumpism. Proponents of these movements demonstrate elements of religious worship in their attempts to propagate their visions for society, which tend to lead to worship of the State. Spiritually speaking, I attribute this to the Fall of Man. Historically speaking, I point to the ancient heresy of Gnosticism as the driving force behind this political worship, arguing that buying the Gnostic philosophy of “immanentizing the eschaton” leads to totalitarianism. To conclude, I offer a Christian vision for proper engagement with government that avoids political idolatry.

Libby Bush, University Scholars

Elizabeth Corey, mentor

The Shepherd and the Lamb: An Analysis of Pagan Influences on Early Christian Depictions of Jesus

Throughout ancient cultures people were drawn to images of their rulers as shepherds. This thesis evaluates the emergence of bucolic imagery, which begins in ancient Egypt, continues into Greece, and comes to fruition in the Hermes *kriophoros*, a representation of Hermes as a shepherd. Hundreds of years after the first *kriophoros*, the early Christians also used this exact imagery to reflect God. But the Christian *kriophoros* falls away in favor of the *agnus dei* or the Lamb of God. This thesis evaluates both the adaptation of the pagan image and the ultimate loss of that image in favor of the *agnus dei*.

Grace Cary, University Scholars

Andrew R. Meyer, mentor

Dancing like Everyone's Watching: The Impact of Competition-Contingent Self-Worth and Belonging on Dancers' Mental Well-Being

Dance poses mental health risks behind its allure. Eating disorders and perfectionism are pervasive and debilitating for dancers; however, broader factors within dance environments that inform their development have received less attention. Competition-contingent self-worth (CCSW) and sense of belonging remain relatively unaddressed within dance literature. This thesis explores pressures upon dancers amidst a culture that prioritizes an aesthetic and technical ideal, with CCSW proposed to enforce patterns of proving and altering oneself, and sense of belonging proposed to alleviate these demands and affirm individuals' worth. A literature review, mixed-methods survey, and evaluation of data through correlation, regression, and qualitative analysis were conducted. CCSW and sense of belonging had a negative but non-significant relationship. However, CCSW had a significant negative relationship with body appreciation and significant positive relationship with ED Risk and Perfectionism. Perceived belonging had a significant positive relationship with body appreciation, a significant negative relationship with Perfectionism subscales, and a negative but non-significant relationship with ED Risk. Qualitative responses emphasized specific environmental factors shaping dancers' experience of belonging. While further research is needed to clarify the role of CCSW and belonging, implications were discussed regarding how these constructs inform dancers' self-concepts and responses to environmental pressures.

Waleed Chatta, Biology

Benjamin Ryan, mentor

Mapping COVID-19 Vaccination Among Students at Baylor University: A Comparative Approach

The COVID-19 pandemic represents a tumultuous time characterized by many challenges but also some successes. As the pandemic continues through its declining phase, vaccination against COVID-19 remains a contentious topic. One group under scrutiny is college-aged students (18-24 year-olds), who can serve as catalysts for the spread of the virus, considering their youth, mobility, and independence. In recognition of this, some institutes of higher education have mandated vaccination among their students, but many more institutions, such as Baylor University, have taken a more passive stance. In light of Baylor's refusal to require vaccination, this study explores trends in vaccination at Baylor and evaluates Baylor's student vaccination rate. First, data was obtained from Baylor's department of Health Services and subsequently analyzed to uncover vaccination trends. Second, vaccination data was gathered from comparable universities—any R1 private 4-year institution in the United States—to evaluate Baylor's student vaccination rate. Three trends were detected: males were generally older than females, and a higher proportion of female undergraduates and male graduate students were vaccinated compared to their counterparts. The underlying reason for these trends was unclear. In regard to overall student vaccination rates, Baylor University had a far lower rate (78.8%) than the average rate observed among other R1

private 4-year institutions (96.4%). However, this difference was largely attributed to all the other institutions mandating vaccination toward COVID-19 at some point during the pandemic, illustrating that mandates can significantly increase vaccination. The only exception was Rice University, which achieved a voluntary community vaccination rate of >90%. From a public-health perspective, a vaccination rate of >70% was classified as adequate to achieve herd immunity toward the initial variants of COVID-19. Considering this, Baylor University met a stated public health goal but fell short in maximizing vaccination among its students.

Alina N. Chrosniak, University Scholars

Jason Whitt, mentor

Wisdom for Aging and Longevity: De Senectute and Proverbs in Conversation with the Modern Healthcare Industry

Faced with an ever-growing aging population, the modern American healthcare industry presents one account of aging, one that is largely tied to health, longevity, and avoidance of disease. However, a look to the past will reveal that aging was not always so focused on these concepts, leading us to ask whether the healthcare industry's account is ultimately sufficient for aging well. In this thesis, we explore the healthcare industry's account of aging and longevity by examining the rhetoric of scientific research, the pharmaceutical industry, and government agencies. We then compare our findings to an ancient Roman account, through the lens of Cicero's *De Senectute*, and an ancient Hebrew account, through the lens of Proverbs. Ultimately, the themes of virtue, wisdom, righteousness, and the fear of the Lord that surface in these latter accounts offer a vision for aging and longevity that is more conducive to human flourishing.

Sophie Cope, University Scholars

Richard Russell, mentor

Pro Patria Mori? A Case Study of Classical Reception in the War and War-Adjacent Poetry of Wilfred Owen, W. H. Auden, Michael Longley, and Seamus Heaney

The mechanized nature of combat inaugurated during World War I disrupted traditional narratives of heroism and warfare, particularly those derived from ancient epics of war like Homer's *Iliad* and Virgil's *Aeneid*. This case study examines classical reception in poems by major British and Northern Irish poets who address major combat events in their works: World War I, World War II, the Northern Irish "Troubles," and the rise of global terrorism. Wilfred Owen's poetry of war forges a new type of heroism in the face of an anonymous enemy, W. H. Auden repudiates the certainty and simplistic morality of the classical epic, Michael Longley captures intimate moments of sectarian violence within close translations of Homeric scenes, and Seamus Heaney transforms Virgil's epic of warfare and imperialism into the possibility for hope and reconciliation in a post-ceasefire Northern Ireland. Although these four poets are rarely compared as a group, their combined works articulate a redemptive trajectory in which the epic of war becomes a tool for potential future peace.

John Caige Copley, Accounting & Finance

Betty Bin Xing, mentor

Taxation and Income Inequality: The Government's Role in Economic Parity

Income inequality is an issue that every country is currently facing that has a negative impact on most societies in a multifaceted way. As a complex fiscal issue, one of the ways to counter this increasingly relevant phenomenon is with curated tax policies put into place by federal governments, specifically with the progressive income tax rate structure, an important tool to mitigate income inequality. This thesis presents analysis and a review of the relevant literature to assess the design of income tax rate structures with respect to reducing income inequality

and improving quality of life for a country's citizens. The factors analyzed include the progressive income tax structure, corporate income tax structure, and the societal ramifications that these policies result in. Comparisons are made between the income tax rate structure and the income inequality metrics between the U.S. and Canada. While there is disagreement in prior literature, there seems agreement that higher tax progressivity coupled with a minor reduction in corporate income tax would reduce income inequality to a certain extent. The impact of these policies on the quality of life of a country's citizens is also discussed when it comes into conflict with income inequality.

Anna Coulter, University Scholars

Elizabeth Corey, mentor

The Myth of Work/Life Balance

The feminist movement over the last few centuries has been essential to the acknowledgement of the historical subjugation of women and the remedy of that through significant legal and cultural changes. However, in this day and age we have reached a point where it is expected of all women to have a successful career, marriage, and mothering experience all on her own-- eventually attaining the status of perfection. In this thesis, I am arguing that work/life balance for women is a myth, because of the modern unsustainable culture surrounding human limitations in the personal and professional sphere. It starts with a historical overview of the feminist movement, including the biographical accounts of key figures and their contributions. The next chapter then moves into a philosophical overview of feminist ideas, and then explore the question of "how did we get here?" in the modern era of "girlboss." The final chapter serves as an argument against work/life balance using sociological data, and then argues for women of the new working generation to utilize their community and personal empathy to embrace the finiteness of all humans and find comfort in that kind of human flourishing.

William Jackson Counseller, University Scholars

Stan Denman, mentor

An Argument for the Use of Acting Training in Medical Education

This thesis argues for the incorporation of theatre performance training into medical education. Theatre performance training applied to medical student education would enhance clinical skills and patient interaction competency by specifying preexisting clinical training which already utilizes role-playing and standardized patient interactions. Through stories, studies, and experiences I expose the need for a type of art education that trains physicians beyond the science of medicine. The expected training in the science of medicine is not sufficient, I argue, to make an excellent physician. A supplemental education in performance art is necessary for the improved application of medical knowledge in a patient-care setting. Medicine is about applying scientific knowledge to people and theatre is an art that understands and teaches human life and interactions.

Akshat Dayal, Baylor Business Fellows & Economics

Wilson Law, mentor

A Comparison Between the Cost and Prevalence of Physicians and Advanced Practice Providers in Services Performed Amongst Medicare Populations

The rapidly changing field of medicine introduces new aspects to care that have created dimensions to healthcare services. With the increasing growth of Advanced Practice Providers, such as Physician Assistants and Nurse Practitioners, and their similar scopes of practice, clarity is needed on the effects of this newly shaped healthcare team and the cost and prevalence of care from these providers. The Centers for Medicare and Medicaid Services

(CMS) prepared a public dataset with annual information on services and procedures performed by physicians, advanced practice providers, and other healthcare providers. This data provides the average allowed Medicare amount, a number that represents cost, and a range of Healthcare Common Procedure Coding System (HCPCS) codes to determine the service performed. Using this data, inferences on the prevalence of physicians and advanced practice providers as well as their cost per service will be assessed.

Bailey Devin, Psychology

Lisa Shaver, mentor

The Best in the Women's Game: Examining How Success Influences Gender Inequities in College Basketball

The 2021 Women's NCAA Basketball Tournament brought national attention to the issue of inequity in women's college sports. However, existing research has proven that disparities between treatment of female and male athletes in terms of financial resources, fan support, and media coverage are longstanding. In this project, I use the *Waco Tribune-Herald's (Trib)* coverage of the Baylor Women's Basketball Team, personnel interviews, Baylor's Equity in Athletics Disclosure Act (EADA) Reports, and data from *USA Today's* gender equity study to examine whether success of female athletic programs helps minimize the differences in treatment they receive. My findings suggest that while women's success in sport helps reduce inequities to an extent, disparities in media coverage and financial resources still exist even among the most successful women's sports teams. These findings indicate that while women have come a long way toward equity in the 50 years since the passage of Title IX, there is still a long way to go to fully achieve equity in women's college sports.

Hailey Dill, History

Meghan DiLuzio, mentor

Builders of a Dynasty: The Social and Political Influences of the Women in Augustus's Imperial Family

Caesar Augustus is renowned throughout history for being the first emperor of the Roman Empire and establishing the Julio-Claudian line. His achievement would not have been possible, however, without the support and efforts of the women in his immediate family. In particular, the social and political influence of his sister Octavia, his wife Livia, and his daughter Julia had immense impact on Augustus's reign. This thesis argues that these women contributed to Augustus obtaining the role of emperor and worked to establish the supremacy of the Julio-Claudian line. This thesis substantiates that claim by analyzing how Octavia, Livia, and Julia achieved this goal by serving as patronesses of public works, mediating between and interceding on behalf of other political elites, acting as pawns for marriage and figures of fidelity, and taking the roles of epitomes of public image and mothers of Rome. This thesis concludes by drawing attention to the fate of the Julio-Claudian line after the death of Augustus and how the memory of these women's political and social roles persisted long after they were gone.

Chloe Dionne, University Scholars

Heidi J. Hornik, mentor

Eve Emerging: Depictions of the First Sinner in Renaissance Art

Genesis 3:6b is one of the most misinterpreted and therefore misunderstood verses in the Old Testament. For centuries, Eve has been characterized as a conniving woman who caused the downfall of man by herself, therefore giving permission for social and ecclesiastical structures to reflect their beliefs about her sin onto women's roles within the world, the family, and the church. To discover the narratives believed and endorsed by artists about Eve and, furthermore, womanhood, *Eve Emerging: Depictions of the First Sinner in Renaissance Art* will focus on distinguishing three main figural archetypes of Eve in painting and printworks: Eve contemplating, Eve tempting,

and Eve ashamed. In the first chapter, the socio-historical contexts preceding these works will be discussed in terms of the definition of biblical womanhood as well as political patronage and the realm of the artist. The second chapter includes thorough iconographic and feminist art theoretical evaluations of ten works created between the years 1425-1578. In my final chapter, I present a discussion covering both the use and influence of 21st century feminist art theory in drawing conclusions about depictions of Eve for modern viewers versus the contemporary Renaissance woman.

Alexander Do, Neuroscience

Michael Scullin, mentor

The Effects of Sleep Restriction and Sleep Extension on Gratitude

Sleep and gratitude are typically low on one's priority list in today's incredibly busy society, especially for college students. However, studies have found that both significantly impact one's health. This study focuses on the experimental manipulation of sleep and its effects on multiple measures of gratitude. The study involved 90 college-aged students and each participant was randomly assigned to one of three sleeping conditions: 1) sleep restriction (5.5 hours of sleep) 2) naturalistic (normal sleep) 3) sleep extension (9 hours of sleep). Data were collected during Session 1 on Monday and Session 2 on Friday, after 4 nights of sleeping conditions. Gratitude measures included validated questionnaires, a gratitude list asking the participant to list out what they were grateful for, and gratitude vignettes. The vignettes were short stories that involved undesirable circumstances while also having a favorable outcome; for example, someone receives a new car but it is totaled in a car accident, however, they survive the car accident with no permanent injuries. After the vignette, the subject is asked questions regarding how grateful they would be in that situation.

Kyleah Druhan, Communication Sciences and Disorders

Lewis Lummer, mentor

The Role of Parental Involvement in Deaf Education on Childhood Emotional Development; a Survey of Achievement Related Attributions and Ability Mindsets of Deaf HS Graduates

Research confirms that parental involvement is one of the most reliable predictors of student academic achievement, future success, language development, and parent expectations. There is little research done, however, on the effects of parental involvement in Deaf education, which poses a unique case because over 90% of Deaf children are born to hearing parents, and under 10% of those parents learn ASL. This study focuses on parental involvement's correlation to students' ability mindsets and achievement-related attributions, features of middle childhood emotional development. In this mixed-methods study, Deaf graduates were surveyed about their communication and relationship with their parents, parents' involvement in their education, achievement and failure attributions, and ability mindsets. The purpose of this research is to help educators and parents understand the importance of parental involvement and the benefits of outreach programs. Results showed significant correlations between parental involvement and both growth mindset about ability and relationship with parents.

Sowmya Duddu, Biology

Tamar Carter, mentor

Longitudinal comparison of haplotype diversity of the invasive malaria vector Anopheles stephensi in Dire Dawa, Ethiopia

Anopheles stephensi, a species of mosquito native to the Middle East and South Asia, has established populations in the Horn of Africa (HOA) in recent years. Due to the fact that *An. stephensi* is capable of spreading *Plasmodium vivax* or *falciparum*, the malaria-causing parasites, its characteristics in the HOA must be studied to provide information for the prevention of population expansion. The aim of this study was to find if there was a difference in the diversity of *An. stephensi* mosquitoes collected in Dire Dawa, Ethiopia between the years 2018 and 2022. The conserved cytochrome c oxidase subunit 1 (*COI*) gene was amplified for each mosquito through polymerase chain reaction (PCR) and Sanger sequenced for further analysis. Sequences representing the six *COI* haplotypes present during 2018 were compared to 20 *COI* sequences from 2022 to observe differences in haplotype frequencies. Haplotype analysis was performed using DNAsp and showed that the 20 sequences from 2022 fell into only 3 of the 6 haplotypes that were seen in 2018 sequences. This implies that the diversity of the *Anopheles stephensi* mosquitoes between the time of both these collections may have decreased.

Reagan Kate Dupler, University Scholars, Political Science, & Film and Digital Media

Zachary Sheldon, mentor

Defining our Enemies: Hollywood's Response to the Cold War and 9/11

At some point in our lives, we have all experienced the “magic of the movies.” Films have a unique power to tell stories that take their audience far beyond reality. However, storytelling also has the power to convey thoughts and feelings about the world in which we live. History and film are inextricably linked in forming our culture. Films provide a forum for discussing ideas while also creating a legacy that will shape the collective memory of future generations. In this thesis, I evaluate two critical periods of contemporary United States history and some of the popular films that provided commentary on these events. During the end of the Cold War and after 9/11, conversations surrounding the nature of patriotism, militarism, and sources of fear permeated America. I recount the historical context of two decades, the 1980s and 2000s, in order to contextualize these conversations. With this backdrop, I identify major themes in science fiction, action, and adventure films that provide insight into Hollywood's perceptions of the greatest threats facing American society. Ultimately, I present the thematic differences between a focus in the 1980s on external threats to the American way of life and a focus in the 2000s on internal threats reflecting corruption in the American way of life.

Samuel Dutschmann, University Scholars

Julia Hejduk, mentor

Lucan's Cato as Impassioned Sage

Lucan in *De Bello Civili* casts Cato the Younger as the *de factos* protagonist; yet, while Lucan is markedly a Stoic, his poetry goes against the grain of the common Stoic belief that Cato Uticensis is a sage-like martyr. By analyzing the historical concept of the Stoic sage in comparison to Cato's dialogue and actions in the epic, I claim that Cato exemplifies both Stoic virtue and vice in various moments of the work. While disqualifying Cato from mainstream notions of Stoic sageship, it is possible Lucan is either adapting Stoicism to his own heterodox Stoic philosophy or detracting from Cato's hagiographical status in Stoicism.

Sean W. Duval-Arnould, Neuroscience

Lara Hwa, mentor

Intermittent Ethanol-induced Fear Memory Impairment with Differential Hippocampal Activation in Male Mice

The limbic system, particularly the hippocampus and amygdala, are oft-studied and well-established regions for fear learning and memory and have been seen to critically underlie the encoding of contextual fear memory. Literature has shown that chronic ethanol consumption has a negative effect on hippocampal beta-dynorphin – a neuropeptide implicated in limbic LTP and fear-forming memories. The impact of self-administered chronic ethanol on hippocampal fear memory has not yet been investigated in mice. In this study, we exposed 3 cohorts of C57BL/6J mice to an intermittent-access ethanol protocol for 6 weeks followed by fear conditioning tests. We found significant differences in freezing behaviour between binge-like drinking mice and water controls on a trace conditioning protocol. Immunohistochemistry for c-Fos was performed, and significant differences were seen in CA1, CA3, and the dentate gyrus between binge-like mice and controls after fear exposure. These findings suggest that chronic ethanol consumption has a dampening effect on fear learning in mice and implicates differential hippocampal activation potentially underlying the behaviour seen.

Shelby Dye, Environmental Science

Julie King, mentor

The Politicization of Climate Change Through Time

Climate change is a topic known to many, but fully understood by few. Known as a “wicked” problem, it is a complex topic that has a compounding number of necessary societal changes to reverse. These issues have caused discourse in the government and media, influencing public opinion by emphasizing the distrust in science to politicize and polarize climate change in the bipartisan United States. Through the study of climate policies, scientific data, private industry, and media, this thesis will analyze the impact of polarized political rhetoric on public understanding of climate change.

Sindhuja Earagolla, Health Science Studies and Biology

Elisabeth G. Vichaya, mentor

An Investigation of Wheel Running Behavior in Models of Cancer-Related Fatigue

Fatigue is an extreme feeling of tiredness, often described as being unable to function at normal capacity. Cancer-related fatigue (CRF) is more severe and persistent than everyday fatigue, causing disruption in all aspects of quality of life. There are currently no standard medical tests to assess fatigue. Comparing current voluntary activity levels to baseline activity levels helps clinicians assess the changes responsible for the observed fatigue. In a murine model, this is characterized by wheel running. This study was conducted to determine the locus of change in fatigue by assessing wheel running across three different models. In the cisplatin model, there was a significant difference in running speed, suggesting that an increase in inflammatory stimuli potentially disrupted the dopamine pathway, leading to a lack of motivation and motor activity. In the tumor model, there was no significant difference found in running speed, potentially due to tumor growth blocking or slowing action potentials, leading to peripheral fatigue in skeletal muscle tissue. Finally, in the early stress model, a significant sex difference was found where females had a greater running speed, time, and distance. This could potentially be due to exercise modulating behavior as a treatment for the experienced stress. Further research has to be conducted to confirm these theories and identify underlying factors for the locus of change of fatigue.

Aliya Endebrock, Science Research Fellows

Bryan Shaw, mentor

A Blind Student's Success: A Case Study Examining the Strategies of Teaching STEM Courses to the Blind

Blind or low vision (BLV) individuals have been traditionally discouraged from pursuing a degree in the STEM field. Although steps have been taken to reverse this mindset, the resources available to aid educators in teaching BLV individuals are still lacking. The aim of this case study is twofold. First, to prove that a BLV student can be successful in university-level STEM courses. Second, to examine the effective methods and technologies that educators can utilize to teach BLV students. A blind student enrolled in both analytical and organic chemistry was interviewed over the course of two semesters to provide insights on the current accessibilities. The findings of this study are used as a point of reference for faculty, student assistants, and future educators paving the way for BLV individuals in the STEM field.

Noah von Engelhardt, University Scholars & Philosophy

Sarah-Jane Murray, mentor

JOY: Scott Drew's Immortal Message (And the Power of Storytelling)

I am directing a short-film tentatively titled JOY: Scott Drew's Immortal Message. The film features an interview with Coach Drew revolving around his famed statement, "The only game that matters is winning the game of life." The film is supported by my multi-year study of the power of storytelling in society. My preface identifies three intertwined characteristics of story: its universality, broad social influence, and moral impact on the audience. I consider how film, specifically documentary film, plays a unique and consequential role as a medium of storytelling in contemporary culture.

Jordan Erickson, University Scholars & Philosophy

Jesse Hoover, mentor

A Foundations Approach to Augustine of Hippo on Grace, Free Will, and Predestination: Understanding the Theological Constraints of Prosper of Aquitaine and John Scotus Eriugena

The Christian Tradition has long struggled to reconcile grace, free will, and predestination. As one of the earliest Christian theologians to explore these topics, Augustine of Hippo laid much of the groundwork for centuries of theological development in this arena. Unfortunately, due to Augustine's unacknowledged change in his position, the Augustinian viewpoint is inherently ambiguous. In light of a lingering difficulty in synthesizing the Augustinian position, this thesis argues for a foundations approach in which the strain and apparent contradictions in Augustine's writings are left unresolved. First, three foundations representing each thread of grace, free will, and predestination will be constructed from Augustine's work. Then, to demonstrate the hermeneutic and its merits, the relevant writings of Prosper of Aquitaine and John Scotus Eriugena—two writers in the Augustinian tradition—will be surveyed through a foundations lens. Through this, the advantage of the foundations approach's understanding of the constraints on patristic and medieval Augustinian writers will be revealed.

Emmett Evans, Health Science Studies

Darin H. Davis, mentor

More Than Physical Therapy: The Implications of Friendship and Virtues in Physical Therapy

Is philosophical friendship a helpful category that should inform the doctor-patient relationship within physical therapy? In general, yes. Learning from friendship and the virtues it cultivates is extremely beneficial to the unique doctor-patient relationship special to physical therapy; it results in delivering a medically ethical, holistic patient-centered care, while simultaneously emphasizing exceptionally personable, virtuous, and Christian principles. This is an all-encompassing practice that should be encouraged for Christian physical therapists to utilize and enjoy, as it ultimately fulfills both patient and doctor's needs, and ethically provides higher quality care by fostering and developing indispensable virtues in the practice of physical therapy. To show this, I first detail renowned medical ethicist Dr. Edmund D. Pellegrino's definitive works on the doctor-patient relationship, and the larger considerations of a patient-centered medical model in the field of physical therapy. I then investigate how friendship is conceptually defined by Aristotle in *Nicomachean Ethics* and is further enriched by Christ and the perfect friendship He introduces to the world, as seen in *The Bible*. For this, I rely on analysis presented by philosophers and theologians Paul J. Wadell, in *Friendship and the Moral Life*, and Stanley Hauerwas and Charles R. Pinches, in *Christians Among the Virtues*. Finally, I discuss the practicality and application of nearly ten indispensable virtues to the field of physical therapy, ranging from humility and compassion to attentiveness and trust. I do this with the help of a plethora of Christian philosophers, in works such as *Happiness and the Christian Moral Life*, *Christians among the Medical Virtues*, and *Being Good: Christian Virtues for Everyday Life*.

Maya A. Ewing, University Scholars

Thomas McGrath, mentor

The Chemical Validation for Ayurvedic Medicine Implementation in American Medicine

America has recently seen a rise in the interest, study, and use of natural remedies in conjunction with the advantages that modern medicine provides. However, there is contention concerning the validity of such natural remedies due to their use for millennia before modern science and technology were able to validate the benefits of such medicinal treatment. In this thesis, the scientific literature of several key spices and herbs used in Ayurvedic medicine—such as cinnamon, garlic, ginger, and turmeric—is studied to determine the chemical and biochemical validity of the use of such natural components. Based on the substantial literature supporting the physiologically advantages of the use of such, an argument is made for the role of natural remedies in preventative and affordable care in the practice of modern American medicine.

Sudili M. Fernando, Biology

Leigh Greathouse, mentor

Impact of Vitamin D supplementation on indole-producing bacterial species abundance in the human gut microbiome of adults

Colorectal cancer (CRC) is the third most commonly diagnosed cancer and the second most common cause of mortality worldwide. With an increasing rate of diagnosis in adults under 50, a better understanding of the CRC risk factors is needed. Research demonstrates that serum vitamin D can reduce cancer risk by improving immune function, and it is hypothesized that the bacterial species and their metabolites, including indole, may control vitamin D response. Vitamin D supplementation's effect on indole production in the microbiome was evaluated in a randomized double-blind control study with 42 participants for 12 weeks. Using the bioinformatic tool PICRUSt we transformed microbial data to identify tryptophan microbial pathways. While there were individualized changes in the microbiome, none of these changes in indole-producing bacterial species or tryptophan microbial pathways were significantly correlated with vitamin D serum level changes. This data suggests that microbiome changes due to vitamin D are highly individualized.

Hannah Fisher, Communication Sciences and Disorders

Hyunsoo Yoo, mentor

Comparison of Discourse Production in Adults with Unilateral Brain Damage

Discourse production has been shown to display the language difficulties of many populations, including those with unilateral brain damage, by providing a means to assess both the microlinguistic and macrolinguistic levels of language production. Additionally, discourse production can help differentiate those with right hemisphere damage (RHD) and left hemisphere damage resulting in aphasia, as it is commonly assumed in research that the left hemisphere is biased for microlinguistic processing and the right hemisphere is biased for macrolinguistic processing (Karaduman et al, 2017). Despite the fact that unilateral brain damage is understood to result in distinct deficits, studies investigating this assumption by analyzing discourse production have produced varying and incompatible results, especially on the macrolinguistic level. The aim of this study is to compare the discourse production differences in adults with RHD and aphasia directly, using Correct Information Units (CIUs) to gain more descriptive and accurate insight on the overall informativeness and effectiveness. This study will compare measures of CIUs between these two clinical populations to determine if % CIUs and CIUs/minute are still consistent and reliable in distinguishing between the discourse production of different populations. We hypothesize that those with aphasia would perform lower on all measures of CIUs and that measures of CIUs, particularly % CIUs, will continue to be reliable measures to distinguish between adults with aphasia and RHD when directly compared. Consistent with previous studies, this study found that measures of CIUs, particularly % CIUs and CIUs/minute, were reliable measures to compare the discourse production of different groups (Nicholas & Brookshire, 1993; Bartels-Tobin and Hinckley, 2005). In addition, our findings support the hypothesis that the discourse production in adults with RHD would be more efficient and informative than that of those with aphasia, as indicated by higher performance on # CIUs, CIUs/minute, and % CIUs.

Grant Fowler, Anthropology & Russian

Adrienne Harris, mentor

The History We Create: European Collective Memory in Jewish Museums

Constructing a historical narrative inherently involves choosing which stories matter and which ones do not, a determination made by people with preconceptions of history and implicit biases. The history presented in museums is a reflection of the collective memory of those that control the museum rather than objective history. Analysis of the narratives presented in Jewish Museums in Berlin, Warsaw, and Moscow reflects how collective memory impacts the way that history is interpreted and presented as objective truth. Understanding the inherent relationship between collective memory and historical narratives in museums highlights the importance of constantly reevaluating and reinterpreting the stories we tell ourselves about our past.

Brooke E. Frank, University Scholars and Political Science

Rebecca McCumbers Flavin, mentor

Violence Against Native American Women and Jurisdictional Barriers to Justice

Native American women are twice as likely to be sexually assaulted than women of other racial groups. This paper explores how America's history of colonization and a series of United States legislative and judicial decisions allowed for this atrocity. Indian Country has been particularly affected by a stripping of tribal sovereignty and an inability to try non-tribal members for major crimes, of which sexual assault is included. The discussion then turns to recent legislative attempts to close jurisdictional gaps and restore tribal justice. These policies represent an important step forward but fail to eradicate the issue. Suggestions for future congressional responses to violence against women are offered at the conclusion of this thesis. Additionally, alternative methods of justice which may be employed by tribes that lack jurisdiction are presented.

Jessica Friberg, Mathematics

Jonathan Tran, mentor

The Role of Christianity in Astronomical Arguments and the Condemnation of Galileo

Whether studying astronomy, biology, physics, chemistry or other areas of the natural sciences, scientists are studying subjects related to Christianity. Throughout the period known as the Scientific Revolution, which is the foundation of these modern sciences, few would have doubted this statement. In fact, most scientists of this period were Christians who sought to discover and understand more about God's creation for his glory. One instance of a scientist that greatly showed the connection and interaction between science and religion is Galileo Galilei. This thesis is an investigation into the context and story behind Galileo, his discoveries, and heliocentrism. It proceeds to break down Galileo's doctrine about science and religion from his *Letter to the Grand Duchess Christina*. The combination of Galileo's condemnation for vehement suspicion of heresy and his argument for the harmony between science and religion demonstrates a complicated relationship between the two. Beyond Galileo and heliocentrism, this relationship is essential to understanding nature. The relationship between science and religion is certainly very complex, yet still intertwined in a way that cannot be discounted.

Katie Galbraith, Health Science Studies

Brian Garner, mentor

The Impact of the Motion of a Mechanical Horse on the Pelvic Motion and Postural Control of Children with Autism Spectrum Disorder

There are currently numerous interventions available to treat individuals of all ages and lifestyles with autism spectrum disorder, or ASD; but one that has become increasingly popular in recent years has been equine-assisted activities and therapy (EAAT) due to the numerous physical, mental, and social benefits it may provide. However, it may not be possible for all individuals to partake in EAAT for several reasons, which may include not having easy access to a facility which provides these services, the individual possessing a fear of live horses, or if the severity of the individual's disability would make this type of intervention unsafe for them, the horses, or others involved. Therefore, Dr. Brian Garner of Baylor University created the MiraColt, a mechanical horse which simulates the motion of a real horse walking in the forward direction, which could possibly be used as an intervention method for these individuals. Dr. Garner and his team conducted a research study which involved nine children, aged 6-12 years, diagnosed with autism spectrum disorder, riding the MiraColt over a series of several treatment, control, and assessment sessions. Balance, gait, pelvic motion, brain waves, speech, and behavior were evaluated in all of these children, however, this thesis focuses solely on the pelvic motion and postural control data of four of the children involved in the study. After data was collected, it was run through the Nexus 2.0 program, then through a code created by an undergraduate engineering student at Baylor University. Data points from these riding sessions were then graphed, and pre- and post-treatment pelvic motion synchronization were compared. From a qualitative analysis, improvements in synchronization of participant pelvic motion with the motion of the MiraColt were seen from the pre-treatment to post-treatment assessment sessions. This overall improved synchronization of pelvic motion and the motion of the MiraColt from pre-treatment to post-treatment implies improvements in coordination of pelvic motion and strengthening of the muscles of postural control, which are primarily located in the trunk, abdomen, and back. These improvements could possibly be transferrable to improvements in postural control in riding a real horse, participation in sports activities, and various activities of daily living, including sitting, standing, walking, and running. Further research is highly encouraged in order to confirm these suggestions, as this can help advance our knowledge to help individuals of all ages with ASD and other disabilities to have the best quality of life possible.

Kavya Ganesham, Biology

Christie M. Sayes, mentor

Characterization of electronic cigarette liquid ingredients using combinatorial techniques: Solubility of chemicals

used in formulations is critical to the study of health effects

The use of electronic cigarettes (a.k.a. the act of ‘vaping’) is considered an alternative method for nicotine uptake compared to traditional cigarettes. ‘E-cigarettes’ are battery powered devices that allow users to heat an ‘e-liquid’ into an aerosol, which is then inhaled. E-liquids or ‘e-juices’ are composed of an active ingredient (e.g., nicotine), solvents, water, and flavoring additives. Due to the variety among composition, it is difficult to study the physicochemical characteristics of all ingredients present in the native e-liquid as well as emissions formed in the heating processes. It is hypothesized that some ingredients, as well as degradants of vaped e-liquids, are cytotoxic. Before cytotoxicity can be measured, however, the solubility of each ingredient and ingredient mixtures ought to be systematically assessed to aid in health effects testing and used to predict potency. The purpose of this project is to provide solubility assessments of e-liquid binary mixtures containing prevalent diluents and flavoring additives. The following three steps were used in the experimental design: (1) literature review of the current knowledge of e-liquid toxicity, (2) miscibility assessment of binary mixtures of three common flavoring additives and (3) preliminary characterization of e-liquid formulations with recommendations for future work. Results indicated that binary mixtures dissolved more readily in reverse osmosis (RO) water than in cell culture media. Miscibility decreased as a result of increasing flavoring additive concentration regardless of dilution in RO water or cell culture media. Nuclear magnetic resonance (NMR) spectroscopy showed minor spectral changes indicating possible degradant formation when comparing native versus and heated samples. In the near future, aerosolized samples should be collected and analyzed via mass spectrometry.

Sarah F. Green, University Scholars

William G. Hoy, mentor

An Esoteric Grief: A Classic Grounded Theory Study on the Impact of Pregnancy Loss

Miscarriage is a grief often marked by silent suffering. This interview-based study implements Glaserian grounded theory to open up a conversation with nineteen individuals about their personal pregnancy loss. Their stories are detailed through their experience with the healthcare system, faith, their own reflections, and the impact of other people, all four lenses having immersed as prominent themes from the interview data. However, throughout these various lenses, interviewees continually revealed that the silent sufferer seeks to be heard, and in the midst of their grief, the hidden and hurting desperately need to be seen. This ought to transform how we approach the suffering of others as their friends, family, physicians, or fellow sufferers.

Grace M. Hall, University Scholars

Jason Whitt, mentor

Christian Physicalism: A Theological Examination of the Mind-Body Problem

The mind-body problem is a puzzle that philosophers, theologians, and scientists have debated for years, leading to various different ontological doctrines. Two of these doctrines, Physicalism and Dualism, have been at the forefront of Christian thought for the past century. Despite centuries of dualistic influence on Western culture, new discoveries in the field of neuroscience have led to a shift towards Physicalism. Christians now must critically evaluate whether Physicalism is compatible with a Christian worldview. By examining the evidence for Physicalism and Dualism, this thesis determines that it is possible for a Christian to be either a Physicalist or a Dualist, while also providing an additional tool to examine these philosophies: Christological anthropology. Using the writings of Vladimir Lossky, supplemented by Rowan Williams, this thesis examines the tools provided by this comprehensive Christological anthropology in order to help Christians take an informed position on the mind-body problem.

Hunter Handley, University Scholars & Mathematics

Brian Simanek, mentor

Continued Fractions: An Arithmetic and Analytic Study

Contemporary research in continued fractions has motivated novel results in spectral analysis— specifically in the characterization of doubly palindromic discrete m - functions. In this thesis, we first discuss historical results in the field of continued fractions by the likes of Euler, Lagrange, and Galois. Next, we discuss an illuminating theorem by Serret before introducing the work of Dr. Edward Burger who classified lattice equivalences via continued fractions. This result is the exact motivation for the analog we provide in spectral m -functions later. The following chapter is a thorough discussion of spectral theory & analysis, which will lay out the background necessary to understand the novel results presented. Topics such as Herglotz functions, discrete m -functions, and J -fractions will be included, along with prior results by Derevyagin et al. and Barry Simon. In the final chapter, we define the tools necessary to state completely novel results: a discrete m -function is congruent to its functional conjugate if and only if its J -fraction expansion has a tail of doubly palindromic Jacobi parameters. This represents the preprint by Handley and Simanek.

Jasmine Hartman Budnik, Neuroscience

Meredith Palm, mentor

Cognitive Performance in Collegiate Athletes at Risk for Sub-Acute Blows to the Head

Sub-acute blows to the head are hits that do not result in the immediate presentation of injury symptoms. However, these blows may pose a greater risk than initially anticipated if repeated, sub-acute brain trauma collectively predicts declines in cognitive performance. Collegiate athletes who play specific positions within their sport are especially at risk of sub-acute blows to the head, which makes them an important population to monitor when determining if there are negative effects of sub-acute blows on cognition and brain health. Electroencephalogram (EEG) data from collegiate athletes from an NCAA Div. 1 men's football team and women's soccer team were analyzed to observe if there were differences in measures of cognitive performance between players at positions of varying levels of risk for sub-acute blows to the head. No significant differences were found between measures of cognitive performance between collegiate athletes in different risk-level categories based on their position. While future studies should be done to evaluate the use of position as a proxy for risk to sub-acute blows to the head and to determine the imaging technology needed to detect additive changes from sub-acute blows, this preliminary study suggests that head-injury prevention and research may be able to be addressed on a team-level.

Mary Hertel, Social Work

LeAnn Gardner, mentor

Breaking the Cycle: An Exploration of the Connection Between Adverse Childhood Experiences and Substance Misuse

Adverse childhood experiences (ACEs) are a set of experiences that can occur in a child's life that can cause trauma and long-term health impacts. ACEs have been associated with altered brain function, heart disease, obesity, depression, anxiety, substance misuse, risky sexual practices, and short life expectancy. There is a close causal link and cyclical nature between ACEs and substance misuse. ACEs increase the risk of substance misuse later in life, living in a household in which a member misuses substances is an ACE, and there is a high risk of parent-child substance misuse transmission. All of which creates a problem cyclical in nature that needs to be addressed by both micro and macro interventions. Micro interventions include parenting programs, promoting positive childhood experiences in the home, and implementing trauma-informed care into treatments. Macro interventions include widespread supplemental childcare systems, community connection, spreading awareness, enacting policies that address the lack of access to necessities, and abolishing policies that actively harm and contribute to adverse childhood experiences.

Allison Ho, Biology

Thomas Spitzer-Hanks, mentor

Oh, The Places We'll Go: An Intersectional Analysis of the Path from Pre-Med to Physician

Physician biases are detrimental to the medical field. While not all doctors carry explicit biases against their patients, doctors may be influenced by implicit biases that then affect the care they provide. An investigation of the educational journey of physicians provides insight into how biases become embedded in the medicinal field. This thesis explores how biases based on race, gender, and other factors are perpetuated and compounded throughout premedical, medical school, and medical field environments. Through an interview with Baylor University's pre-health director and a survey sent to students, I examine how Baylor prepares its premedical students for medical school. I then investigate the perpetuation of biases within the medical school environment. I then focus on the practicing medical field and the consequences of biases in healthcare. With biases present throughout a physician's educational journey, I argue that biases should be continuously addressed throughout a physician's development to prevent these biases from impacting patient care.

Alan Hollinger, Church Music & Greek

Timothy Heckenlively, mentor

The Role of Gaia Pelore in Hesiod's Theogony

Gaia Pelore plays a crucial role in shaping the order of the cosmos and is described by a unique epithet: *pelore*. Though defined as 'monstrous,' this epithet is often translated as 'big' or 'vast' and is regarded by some scholars as a mere formula. Chapter 1 shows how *Gaia Pelore* is a marked epithet and has a significant role in each Succession by engaging in a close reading of the three Successions in the *Theogony*. Chapter 2 explores the relationship between *Gaia Pelore* and *metis* by analyzing the uses of her cunning intelligence. Chapter 3 explores the relationship between *Gaia Pelore* and gender by analyzing the gender dynamics in the *Theogony*. Chapter 4 explores the relationship between *Gaia Pelore* and monstrosity by comparing her to other monsters in Archaic Greek literature, particularly those with the epithet *pelorus*.

Jamie Holodak, University Scholars & Spanish

Bryan Brooks, mentor

Identifying and Understanding Workforce Education, Training and Outreach Needs in Decentralized Wastewater

Horizon scanning exercises allow scientific researchers in different fields to identify emerging issues and challenges at the global, national, or local scales. Identifying these issues and prioritizing needs in research and practice for a given industry is important for decision makers and funders to be able to intentionally and effectively allocate resources and respond to challenges. The onsite wastewater industry is crucial to protecting public health in small, rural, or suburban communities across the nation and around the world. Recent literature has emphasized a concern for the future of the industry's workforce in the United States, characterized by a decline in numbers of professionals due to increasing retirements and insufficient education and training opportunities, among other challenges. However, the workforce is not comprehensively well understood, and a widespread assessment of needs for the industry has not been completed until now. In 2021, Baylor University partnered with the National Onsite Wastewater Recycling Association (NOWRA) to conduct a nationwide survey (NOW-R²) of professionals working in the decentralized wastewater industry. This thesis examines the results of the NOW-R² survey and presents ten priority problem statements for the industry related to workforce education, training and outreach.

Anne B. Huntington, University Scholars

Scott H. Moore, mentor

An Analysis of Wendell Berry's Vision for Creation Care

As technology has developed in the last century, many small farming communities in America have lost their connection with their community and their land. Previously, these communities need for each other, and dedication to caring for their farms, shaped their understanding of what it meant to be human and live well. There was a deeper care for the way their choices impacted the land. People understood that they were a part of a creation, rather than an environment. In Wendell Berry's fiction, he captures and expresses the experience of these small farming communities that have been lost. In his non-fiction, he explores some of the specific errors in understanding of land use and care, and corrects many of those errors. This work will explore some of these flawed assumptions and their corrections according to Berry and conclude with an evaluation of their efficacy and feasibility.

Miguel Iglesias, Science Research Fellows & Biochemistry

Bryan Shaw, mentor

Strategies to Improve the Inclusion of Disabled Students in STEM - a Review

Students with disabilities often encounter ableism when pursuing an education or career in the fields of science, technology, engineering, and math (STEM). Barriers are found in the classroom, laboratory, and interactions with faculty and students. These obstacles have negative impacts on the educational and career outcomes of the students who face them. Despite these difficulties, students with disabilities still seek out degrees and careers in the STEM fields, often with great success. Having proper support, mentorship and access to accommodations enables even more students with disabilities to have positive experiences in STEM. Thus, it is important that those without disabilities help reduce barriers that may currently exist; though, to do so can be a daunting task for professors and students. This is especially true for those who may be unaware of how to support their peers with disabilities. Thankfully, numerous solutions and strategies to combat common problems have already been developed and explored. These solutions, and the barriers they eliminate will be described for students who are blind or visually impaired, those who are deaf or hard of hearing, and finally those with an autism spectrum disorder. Learning about these barriers and their respective solutions will enable others to promote and create a more inclusive environment in the fields of STEM.

David Jacks, University Scholars, Latin & Greek

Jeff Fish, mentor

Mētis and Dolos in Homer and Hesiod

Deception has been a part of societal interactions since the dawn of time, and this did not go unnoticed by the ancients. Indeed, in Hesiod's *Theogony*, some of the earliest acts fundamental to ordering of the cosmos are acts of deception, and one of the most popular Homeric heroes, Odysseus, even boasts that he is known among men for his various acts of trickery. The way in which deception seems to pervade archaic Greek hexameter poetry is somewhat baffling; both "heroes" and "villains" often engage in similar acts of deceit, yet the outcomes of and the judgments leveled upon their actions are wildly dissimilar. In my thesis, I look to Homer and Hesiod to examine the portrayal of two concepts intimately related to deception: *mētis* (μητις)—a cunning, adaptable, forethoughtful mental state—and *dolos* (δόλος)—a trick or snare. I posit three ideas: 1) unlike *dolos*, *mētis* has no moral connotations; 2) to successfully employ *dolos*, one must have *mētis*; 3) the close connection of deceit and female figures, both mortal and divine, necessitates that male figures who engage in deceit be understood as living and acting in the domains of both the male and the female.

Jessica James, Medical Humanities

Troy Abell, mentor

Race-Specific Modeling of Infant Mortality: 1995-2013

Infant mortality, which is defined as the death of an infant within the first year of life, serves as a valuable indicator of the overall health of a nation. The United States consistently ranks among the highest infant mortality rates when compared to other developed countries, and health equity is an important concern especially as it relates to care at the beginning of life. This study aims to analyze the disparities in infant mortality between infants of African American and European American descent over an eighteen-year period from 1995 through 2013, controlling for sex, birthweight, and gestational age. The data were obtained from the CDC's Linked Birth and Infant Death Data and analyzed biannually for a total of ten years studied over this time period (n > 30,000,000 births). These data were then utilized to calculate cumulative infant mortality, perinatal mortality, and neonatal mortality for each of the ten years individually and across the entire dataset. It was found that mortality in each of these three categories declined from 1995 to 2013 for both African American and European American infants. African American infants consistently had a higher mortality level than European American infants; however, it was found that this disparity decreased in all three mortality categories over the eighteen years studied. Continued research will examine interactions between race and sex, birthweight, and gestational age and the subsequent association with infant mortality during this time period in an effort to more accurately comprehend the disparities in infant mortality in the United States to point toward potential solutions to make healthcare more equitable.

Phoenix Jampol, University Scholars

Jeff Forsche, mentor

The Father's Influence on Cardiometabolic Risk Factor Development

Current research on the influence of parents and caregivers on childhood development has focused on psychological, social, physical, and spiritual health. In recent years cardiometabolic disease prevalence has increased among younger individuals at earlier time periods. The full extent behind the rapid development of these diseases remains unclear, though significant research has been done to support to influence of the mother in proper childhood development. However, there is a limited amount of published research that has isolated the specific role that fathers have on future physiological health outcomes, especially those in relation to cardiometabolic health. Due to the scarce amount of literature involving the father's role in influencing cardiometabolic health outcomes, a clear consensus cannot be fully ascertained and future research into this area is severely needed. This thesis pursues to consolidate the literature and expound upon the data in the field. A

survey was distributed to gather data on known covariables of cardiometabolic diseases (socioeconomic status, exercise, nutrition) and the presence of a father figure. Our results showed no significant correlation between the presence of a father figure and self-reported cardiometabolic diseases. More research needs to be done in this field to further the data and expound upon the father's influence in health outcomes.

Madeleine Jarecki, Neuroscience

Timothy DeJong, mentor

Haunted Houses: Ghosts of Absence and Hope

This thesis discusses the poetry of Joanna Klink and Christian Wiman and presents original poetry in order to ponder the reality of life contingent on circumstances outside human control. The first two chapters explore how Klink and Wiman's poetry approach uncontrollable realities like isolation, grief, and illness. The ultimate of these is death, which is considered variously: as inevitable, as a journey, as loss, as an enemy, or perhaps, as transformation. These elements speak to some sort of absence, highlight how need shapes human identity, and unexpectedly reveal positive elements. Chapter Three narrates this thesis' development and discusses the author's poetry in light of Wiman and Klink's work. The poetry of Chapter Four pictures the workings of a distressed mind as a house. The reader is invited to join the ghosts of this house in stories that undertake to find hope—itsself an absence of what we desire.

Lauren Jarvis, University Scholars

Richard Jordan, mentor

Weighing Politics and Idealism: The Four Waves of US Humanitarian Strategy

Humanitarianism weighs a tension between geostrategic decisions to achieve US grand strategy and altruistic contributions to alleviate human suffering. Humanitarian policies therefore fluctuate and can be difficult to predict or explain. This thesis analyzes patterns in US humanitarian strategy since 1945 and identifies four waves: the political Cold War (1945-1991), the idealistic post-Cold War (1991-2001), the balanced post-9/11 (2001-2020), and the balanced but altruistically disguised post-COVID-19 (2020-present). The thesis uses data collection about US aid, intervention, and resettlement responses to crises and archival research to determine the unique strategies, motivations, and infrastructure of each wave. It also reveals the consequences of humanitarian strategies that are too political and too idealistic. Overly political humanitarianism is cautious, lethargic, and at times morally offensive. Overly idealistic humanitarianism lacks boundaries and is overextended and imprecise. This thesis concludes by proposing a humanitarian strategy that allows politics and idealism to counterweight each other's flaws: a strategy that uses idealism to spur leaders to respond to crises that may not be politically advantageous and that uses politics to constrain idealistic ambition within pre-established guidelines.

Maheen Kara, University Scholars

Matthew Andersson, mentor

Creating a Policy Context for Combating Adverse Childhood Experiences and Improving Maternal Health in Texas

This study includes a detailed overview of the trends of adverse childhood experiences (ACEs) in the context of the intergenerational effect between motherhood and parenthood and its effects on maternal health. The frameworks outlined provide multiple theories and models for how ACEs affect an individual short and long term. I specifically look at Texas in comparison to the national level of ACEs, social determinants of health, maternal outcomes, and associated variables through a descriptive and empirical analysis of the *America's Health Rankings* dataset. For further analysis of state-to-state comparison, I look at Medicaid and health policies from the top four healthiest states for women's and children's health and compare those findings to Texas. To conclude, I offer a multifaceted

approach to mitigating the negative effects of ACEs on maternal health outcomes by recommending a proactive and reactive approach in state policies. Overall, maternal health and ACEs cannot be neglected as it is an intergenerational cycle and Texas needs to make changes to its state policy to improve the status quo for mothers and children.

Kristiana Kasper, Biochemistry

Daniel Romo, mentor

Enantioselective Synthesis of Six- and Seven-Membered Lactams

Lactams are nitrogen-containing cores present in a variety of compounds with medical applications, of which piperidones and benzazepinones are examples. Piperidones are being investigated for anti-cancer restoration of p53 expression. Some benzazepinones inhibit receptor protein kinase D (PKD), a receptor implicated in cancer pathogenesis, and others modulate the gamma-secretase complex, which is responsible for amyloid oligomers associated with Alzheimer's disease. Benzazepinones can also be used as intermediates in antibiotic synthesis. The development of lactam-forming methodologies makes syntheses of these molecules more accessible. Stereoselective mechanisms are useful because many pharmaceuticals rely on their stereochemistry to bind to their targets. The use of chiral catalysis provides this stereoselectivity with the added benefit of enhanced reactivity that increases reaction speed. Acyl ammonium salt formation is an especially promising application; a nitrogen-containing chiral catalyst is acylated by a precursor with reactivities suited to the desired reaction. Acyl ammonium salts can act as intermediates in lactam synthesis by the addition of amine bisnucleophiles. Examples of bisnucleophiles include aminomalonates and amine-tethered carbon radicals. The latter have recently been used to form five- and six-membered lactams, using several different bisnucleophiles, with a variety of stereoselective substitutions at the beta position. Experiments described show application of this methodology to the formation of seven-membered lactams.

Yehyung (Andrew) Kim, Biology

Joseph D. White, mentor

Changes in stomatal conductance in response to rising atmospheric carbon dioxide levels

Ever since the emergence of the first plant species, plants have been altering their physiology in response to changes in external stimuli. One important factor for plants is the continual change in atmospheric carbon dioxide levels throughout Earth's history. Stomatal conductance is one plant characteristic that has been affected by the atmospheric carbon dioxide levels at short and long-time scales. Stomatal conductance is the diffusivity of water vapor and CO₂ across the distance of the stomatal pore. To assess the stomatal conductance of plants over approximately a century, herbarium specimen from the Baylor Herbarium (BAYLU) were selected and scanned under a 3-D laser microscope. *Osmunda regalis* was selected to represent the monilophytes, *Pinus taeda* for the gymnosperms, and *Rubus trivialis* and *Prunus serotina* for the angiosperms. This study hypothesized that the angiosperms would exhibit greater plasticity in their stomatal conductance in response to increasing atmospheric carbon dioxide, which meant significant changes would be made in their stomatal physiology and/or density. Upon analysis, it was found that only *Rubus trivialis* exhibited significant changes in stomatal conductance in response to increasing atmospheric carbon dioxide. Further analysis on vein density, water use efficiency, and plant response to carbon dioxide levels were made based on the findings.

Yeasong Esther Ko, Neuroscience

Lara Hwa, mentor

Serotonin regulation of intermittent and continuous alcohol drinking in male and female C57BL/6J mice with systemic SB242084 and buspirone

This study aimed to assess the therapeutic potentials of novel serotonergic compounds in treating alcohol use disorder by investigating the effects of SB242084 and buspirone on intermittent and continuous alcohol consumption in male and female C57BL/6J mice. Mice were given intraperitoneal injections of 0.3, 1, 3 mg/kg SB242084 or 1, 3, 10 mg/kg buspirone, and subsequent alcohol and water consumption were measured. SB242084 dose-dependently attenuated alcohol drinking for intermittent alcohol drinking in male mice but did not significantly alter alcohol drinking in mice given continuous access. In comparison, buspirone suppressed intermittent and continuous alcohol drinking in both males and females but also reduced distance traveled in the open field test. Observed differences in responses to SB242084 between drinking groups may imply differing neural mechanisms between heavy and continuous drinking driven by serotonin. These findings suggest the therapeutic potential of compounds blocking the 5-HT_{2C} receptor for alcohol use disorders.

Alec Kramer, Science Research Fellows

Christie M. Sayes, mentor

Developing a complex co-culture model for the Central Nervous System to assess biological interactions within in vitro settings

Cell culture models are highly utilized in many fields of science. Several models have been created to replicate physiological structures. These cultured systems use multiple cell types together, which increases the complexity of the physiological response elicited by the system. Some of these constructed models have been able to replicate structures such as the intestinal lining, alveolar space, and blood-brain barrier. However, there are many more physiological structures which could be replicated through complex co-culture models. The Central Nervous System (CNS) is comprised of dynamic tissue which naturally incorporates several different cell types together. There are multiple current and well-established cell culture lines which are analogous to the neurons, microglia, astrocytes, and oligodendrocytes found within the CNS. Combining these cell types to replicate the CNS would provide a new and innovative method for toxicological and pharmaceutical assessments, and further advance the field of in vitro testing.

Kayla Lampe, Baylor Business Fellows & Economics

Meghan DiLuzio, mentor

An Analysis of Rapid Onset Gender Dysphoria

Over the past decade, the numbers of transgender identifying individuals has significantly increased, particularly amongst adolescent females. Concurrently, a rapid increase in the medical developments to aid in transition and policy changes due to the influence of the transgender community and its advocates has occurred. This thesis addresses hypotheses of the underlying influences due to this increasingly prevalent phenomenon, pertaining to its increased visibility, stigma and pathological reduction, peer influence, and more. The paper will begin with an overview of the transgender history and the development of understanding gender dysphoria. Next, I will present literature that advocates for the theory of Rapid Onset Gender Dysphoria (ROGD), a term coined by Lisa Littman which claims that some adolescents experience gender dysphoria due to external influences, of which will fade with time. Next, I will review literature in opposition to the theory of ROGD, some of which are in direct response to Littman's study of which ROGD was named. Finally, I conclude with the assertion that more research is needed before gender affirming medical treatments are prescribed for social transitioning of adolescents and contend that affirmation of gender dysphoria in adolescents may not be the best course of action and may be harmful.

Samuel Leibovsky , University Scholars

Julie deGraffenried, mentor

The Anchors of Pregnancy Experience: A Historical Survey of Hospitality in Childbirth and Pregnancy

What historical factors were paramount in creating safe and meaningful pregnancy experiences for women? While a woman's pregnancy experience is at times addressed as an element in the process of childbirth, historical studies on the multivalences of pregnancy experience and their social impact are minimal. This thesis suggests that dimensions of traditional hospitality are recurring modalities within the historical development of prenatal care. This thesis surveys three historical case studies of "birth-centric" hospitality in the traditional (1000-1200 C.E.), modern (1700-1900 C.E), and postmodern (1940-Present) models of obstetrical care. By comparing traditional prenatal practices of the medieval Mediterranean, early modern Russia, and the postmodern obstetrical methodology of Dr. Fernand Lamaze, this thesis considers the multigenerational challenge of providing hospitality to mothers through the combination of maximal medical safety and empowered childbirth experiences. This thesis will conclude by highlighting correlations between traditional anchors of pregnancy experience and their direct influence on hospitality in modern obstetrical healthcare.

Harper Leigh, Journalism

Natalie Carnes, mentor

The Light We Love: A Discernment Framework for The Kinds Of Images We Consume And Create On Social Media

I doubt whether we really pay attention to all the images we create in a day. Even more, I doubt we really pay attention to all the images we consume in a day, especially on social media platforms. So how might we discern the images we consume there? How might we know what kinds of images we should share with others? Inspired by my own experiences as an adolescent during the rise of social media, and drawing on Augustine's Confessions, I create a discernment framework to aid our spiritual sense of sight in this environment. After considering how to discern the types of images we consume, I then put forth a framework for kinds of images we can create in this environment by elaborating and displaying my own examples.

Karissa R. Lonon, University Scholars

Jodien Johnson, mentor

Define the Relationship: The Correlation Between Women's Relationship Context and Contraceptive Behaviors

Throughout American history, relationship status has been tied to contraception. For 100 years, state and federal laws limited contraceptive distribution only to married couples; for the past 50 years, however, it has been legal for all people in the United States—regardless of relationship status—to access and use contraceptives at their own discretion. Contraceptive use trends are well-documented in the National Survey of Family Growth, which reveals that a correlation between relationship status and contraceptive use still exists today among American women. In addition to nationally representative NSFG data, which show that relationship status has some bearing on the use of specific contraceptive methods, smaller studies have shown that more nuanced relationship factors and partner dynamics are also related to the use of specific methods, nonuse, and contraceptive inconsistency. While many variables are connected to contraception, relationship context has emerged as a particularly complex yet important aspect of women's contraceptive behaviors.

Blakely Lowe, Political Science & French

Dave Bridge, mentor

"Women Like Hunting Witches Too": An Electoral Study on Women's Sexism

Sexism is pervasive. Many studies look at how paternalistic or patriarchal norms affect male views and behavior of females. This study examines how those norms affect females' behavior. In particular, I examine the effect of gender on Hillary Clinton's 2016 presidential bid. I ask, "Why did female voters vote for Donald Trump?" Or, spun

differently, “Why did female voters vote against Hillary Clinton?” After controlling for the “usual suspects” (e.g., party identification, ideology, etc.), I find that women who were not in the work force were significantly more likely to vote against Hillary Clinton. I theorize that these women harbored sexist views against Clinton—that the concept of another female in the White House was too disruptive and foreign to tolerate.

Lindsay Mahler, University Scholars

Erika Abel, mentor

Exploration of Attitudes Toward HPV Vaccination Among Hispanic College Students

Human Papillomavirus (HPV) is the most common sexually transmitted infection in the United States, with an estimated 79 million Americans currently infected with HPV (Cleveland Clinic, 2022). HPV is associated with the development of several cancers, including cervical, oropharyngeal, and others (de Martel et. al., 2017). The Hispanic population is disproportionately affected by negative health consequences attributable to HPV. Hispanic women are 40% more likely to be diagnosed with cervical cancer and 30% more likely to die from the disease than non-Hispanic White women (American Cancer Society, 2021). Despite these statistics, only 53.7% of Hispanic adolescents have completed the HPV vaccination series (CDC, 2021a). It is unclear why HPV vaccination rates in the Hispanic population fall short of the target rate. To address this question, we surveyed undergraduate students at Baylor University to identify reasons for hesitancy toward the HPV vaccine in the Hispanic student population. The results of this study have implications for the future promotion of the HPV vaccine in the Hispanic population.

Isabella Kaethe Marra, University Scholars

Liang Wang, mentor

Readability of Online Patient Resources: English vs Spanish

In this project, the education level needed to read digital patient education materials is analyzed. The readability levels of the 15 most popular websites on cardiovascular disease in both English and Spanish are collected. Upon analysis, both English and Spanish resources were found to have an average reading level higher than that of the average American. This calls for a push for resources with information not only accessible but also comprehensible to the patients which they are created for.

Zane Martin, University Scholars

Anne-Marie Schultz, mentor

Philosophy and Wrestling: the Influence of Wrestling in Platonic Dialogues

Plato saw wrestling as a way to educate the youth of Ancient Greece in the ways of virtue. In his dialogues that take place in wrestling schools: Lysis, Charmides, Laches, and Euthydemus, Plato gives examples of how young boys should be taught and also shows the faults in how the youth are being raised. He looks at virtues that need to be taught and shows examples of boys who do not have these traits because their teachers do not have the virtues. Then the culture of wrestling is compared to the culture of weapon fighting. Wrestlers are trained to be philosophers who care about the truth and uplift others toward wisdom, while weapon fighting paves away from sophistry and the culture of only wanting to win and being willing to sacrifice wisdom for the win. Through wrestling in Ancient Greece, one gained virtues: courage, humility, and cooperation. These virtues can still be gained through wrestling today, which is why wrestling is one of the best preparatory activities one can do for wrestling.

Riley McCready, University Scholars

Elisabeth Vichaya, mentor

Chronic stress exacerbates hyperglycemia-induced depressive-like behavior in male mice

Among chronically ill populations, affective disorders remain underdiagnosed and undertreated. A high degree of comorbidity exists between diabetes and affective disorders, particularly depression and anxiety. While the mechanisms contributing to stress-induced affective dysregulation are currently being parsed out, a direct comparison between stress-induced and hyperglycemia-induced affective dysregulation would provide insight into more effective treatments for diabetic patients suffering from depression/anxiety. The present study was performed in order to explore the effects of chronic stress and hyperglycemia in a preclinical model. We observed distinct neuroinflammatory and behavioral profiles in response to chronic stress and chronic hyperglycemia. STZ-induced hyperglycemia was associated with increased depressive-like behavior, elevations in hippocampal *Bdnf* and *Tnf- α* expression, and elevations in prefrontal cortex *Il-1 β* expression. Chronic stress produced alterations in anxiety-like behavior and decreased prefrontal cortex *Il-1 β* expression. While chronic stress and hyperglycemia can individually produce affective dysregulation, their combination exacerbates the symptom burden and is indicative of distinct neurobiological mechanisms.

Mallory McKeever, Professional Writing and Rhetoric

Lorynn Divita, mentor

The Aesthetics of Wartime: A Review of Women's Fashion in the 1920s and 1960s

Fashion has operated as a reflection of humanity and its role in history from the time that Adam and Eve first lifted fig leaves to their body to hide their shame. Beginning with a novice Aristotelian logical argument and a historical understanding and fashion analysis of the 1920s and 1960s, it is clear that women's fashion has significant cultural importance. This thesis answers the question "Does fashion matter?" by looking at the zeitgeist of two post-war decades and connecting it with fashion trends. The theory of the zeitgeist states that fashion is a reflection of the cultural climate guided by the current dominating events, ideals, and attitudes. A fashion count analysis was also conducted on Vogue US' first issues for the months of March and September in the 1920s and 1960s. The zeitgeist allows a connection to be drawn between historical context and the fashion of that time to prove that fashion is a fundamental and vital part of history and culture.

Meagan McMann, Biology

Jonathan Tran, mentor

The Theological Implications of Theistic Evolution Through the Lens of the Evolution of the Eye

The evolution of the eye is highly complex. The eye has evolved from a nondirectional photoreceptive cell to a compound eye. This can be tracked through phylogenetic trees, molecular genetics, and the fossil record. Proteins continue to progress the evolution and development of the eye. This thesis discusses the scope of the evolution of the eye through the lens of new atheism (NA), young earth creationism (YEC), and theistic evolution; this thesis is primarily focused on the evolution of the eye through the lens of theistic evolution. NA sees the evolution of the eye as a development from natural selection to better preserve the genetic material of organisms. YEC sees the eye as entirely created by God in its kind. The implications of theistic evolution are discussed, specifically in the view of the evolution of the eye. Scripture and science both show truth from God, and both hold authority. Theistic evolution meets the authority of scripture and science from YEC and NA, and theistic evolution points to God using natural selection to progress and refine his creation through time.

James McNeal, Baylor Business Fellows & Finance

James Kendrick, mentor

Pop Culture's Obsession with Villains and its Relationship with Events that Weaken Institutional Confidence

Beginning in the eighteenth century with the First Great Awakening, American pop culture obsessions have correlated with surrounding events. The First Great Awakening correlated with the Christian thought in the Declaration of Independence and the Constitution. The context of the events leading into the present day includes the intersection between The Cold War, Billy Graham, Neo-Conservatism, and Bill Clinton, which helped to shape the current era of villains. Today, an obsession with villains and their perception to modern audiences, particularly in film, television, and comic books, dominates American society. Beginning in 1999 with the release of *Star Wars: The Phantom Menace* and its focus on Darth Vader's origin story, pop culture has expanded its emphasis on villains to include Deadpool, Magneto, Maleficent, Cruella de Vil, and Loki, among others. Interlaced with the rise of the current obsession has been a correlation of events that shake confidence in institutional control, including but not limited to 9/11, the 2008 stock market crash, the 2016 presidential election, the Covid lockdown, and George Floyd's murder. The frequency of such events correlates with the number of projects focusing on the antagonist in well-known stories. It is improbable that any direct causation is involved, but there is a correlation between said events and the villain-centered projects.

Emily Milton, Medical Humanities

Ruthie Davis, mentor

Parents' Adaptation and Coping Strategies in the Diagnosis and Treatment of a Child with Cancer

The experience of diagnosis and treatment of pediatric cancer affects the patient's family along with the patient. Throughout treatment, parental roles are shifted towards caregiving in a medical context. To more thoroughly understand the effects of pediatric cancer on the parents of children with a cancer diagnosis, interviews were conducted with three mothers of pediatric cancer patients. The researcher filed information with the IRB to conduct not human subject research. A list of questions was used to direct the interviews, allowing the subjects to share their medical experiences. Three interviews were recorded, providing an overview of the parental experience through childhood cancer. Forms of support were analyzed to determine helpful and unhelpful support techniques for parents. Coping strategies were analyzed to account for how parents adapt to a child's cancer diagnosis and treatment.

Neha Mullassery, Biology

Cheolho Sim, mentor

Varying Gene Expression in The Fat Body and Ovary of Diapausing Mosquito Culex Pipiens

The *Culex pipiens* is a vector for the West Nile Virus and enters adult diapause, a programmed state of dormancy for surviving winter conditions. During diapause, mosquitoes undergo a variety of phenotypic changes, such as arrested development, lipid accumulation, and lifespan extension. The fat body and ovarian development were noted to be altered in diapausing *Cx.pipiens* and thus transcriptome profiling of the fat body and ovary was used to identify downstream genes that are involved in the formation of unique histone modification patterns that contribute to the diapause phenotype. Previously, RNA-sequencing was used to identify notable genes. This portion of the research used quantitative RT-PCR to validate candidate genes that were identified from the RNA-seq data. It was found that 246 fat body genes and 328 ovary genes were upregulated in diapause mosquitoes. These genes are involved in lipid synthesis, yolk production and the resistance mechanism, confirming the phenotypes associated with diapausing mosquitoes. qRT-PCR confirmed that the genes are upregulated in the fat body. Additionally, it was found that genes associated with histone methylation and demethylation are also differentially expressed in the fat bodies of diapause mosquitoes, such as the histone demethylation gene UTX which is upregulated in the diapause fat body.

Rebecca Mulley, University Scholars

Rich Sanker, mentor

r/Mentor: An Analysis of Social Media Mentorship for the Premedical Students of Generation Z

With the influx of Generation Z into the realm of undergraduate education, the tides of professional mentorship are beginning to change. Formerly reliant on in-person guidance from mentors, premedical students in the current generation are flocking to social media platforms to fulfill this same purpose. However, the current field of research has neglected to investigate this new phenomenon. Therefore, this study addresses student's usage of and satisfaction with social media mentorship compared to traditional in-person mentoring relationships. Utilizing a survey distributed to undergraduates at Baylor University, data was collected and analyzed using statistical methods. Overall, it was found that over half of students reported regular usage of social media for advice regarding their premedical career. However, despite the high frequency of social media use, students still rate in-person mentorship as more satisfying on every measure addressed. Thus, despite the rising popularity of social media mentorship amongst Gen Z students, in-person mentorship still appears to offer students an experience that social media is not yet able to replicate.

Natalie Muñoz, Medical Humanities

Jeff Levin, mentor

Burnout in the Wake of COVID-19: How Healthcare Providers in Critical Care and Emergency Medicine Have Coped with Burnout Due to the Coronavirus Pandemic

As I reflected and learned about the experiences of healthcare workers on social media during the COVID-19 pandemic, I realized that I was curious about how healthcare workers dealt with the historical pandemic on the front lines. To further research the experiences of frontline healthcare workers, I conducted interviews with medical personnel who responded to the pandemic, including nurses, emergency medicine physicians, trauma surgeons, respiratory therapists, and others from the San Antonio area in Texas. Through my research, I learned about the experiences of front-line workers, how they dealt with a life-changing pandemic, how it changed them, what their fears were, and more. As a future healthcare provider, I would hope to learn from this experience so I can conquer burnout and any other pandemic that life might throw at me in the future.

Emma Nelson, Political Science

Peter Campbell, mentor

An Analysis of Combat Experiences Through Short Works of Historical Fiction

The experiences of American soldiers serving in different wars, while often showcased in film and print media, are rarely compared. The purpose of this project is to perform a cross-war qualitative analysis of the similarities and differences in American soldiers' experiences during their day-to-day lives. The following short stories showcase some of the daily events and conditions that foot soldiers faced while serving in The Great War, World War II, and the Vietnam War. While the historical details provided in the stories are accurate to their respective periods, the central characters are fictional. However, the characters in each story are somewhat reflective of the archetypal foot soldier of the respective period, based on oral histories, veteran interviews, and literary research. This format allows for a comparison of the historical facts of each war as well as an exhibition of similarities and differences in soldiers' psychological experiences.

Naya Noffske, University Scholars

Jeff Levin, mentor

Anxiety and Christian Faith in College Students: Through the Lens of Provider and Student Perspectives

Anxiety can impact individuals in every area of life, and this condition continues to become more prevalent. In recent decades, there has been an increased research focus on anxiety and its various manifestations. The college years can be an especially turbulent time for some individuals, with unique factors that can contribute to anxiety. For many students, faith is an important way to cope with the experience of anxiety. To address this issue, this thesis reviews the literature on anxiety in this population, especially among college students, and with special reference to the impact of religious faith and spiritual life. This is an understudied area within the research field on adolescent anxiety, which inspired the present project. Qualitative interviews were conducted in order to collect data from a variety of mental health providers and current students who have dealt with anxiety in a Christian context. Providers in pastoral care, clinical psychology, counseling, and chaplaincy were interviewed about their experiences helping students of faith in the Waco area cope with anxiety. Multiple students were interviewed as well in order to share their personal experiences coping with anxiety during their college years, with a special focus on the importance of their Christian faith. Finally, this thesis includes a discussion of common themes that emerged across these interviews and practical applications of these findings are provided.

Uchechukwu Oguchi, University Scholars

George Njung, mentor

A History of Constitutional Making and Ethnic Distrust in Colonial Nigeria, 1945-1960

On January 15, 1966, Nigerian Igbo soldiers, Chukwuma Kaduna Nzeogwu and Emmanuel Ifeajuna led a successful coup d'état, killing several Nigerian politicians including the Prime Minister, a Hausa man named Abubakar Tafawa Balewa. The world watched in horror as this event spiraled into ethnic violence and eventually a brutal civil war in 1967. Before 1966, Nigeria was seen as the golden child of the British decolonisation in Africa. It was an example of peaceful decolonisation and apparent success in achieving unity for a country as diverse as Nigeria. So, how did it fall so quickly into ethnic violence six years into its independence? This thesis examines the fifteen years prior to Nigerian independence (1945-1960) to reveal that British colonial constitution-making processes contributed to the swift outbreak of violence after independence. It analyzes how the four constitutions created during the decolonisation period politicized ethnicity and embedded seeds of ethnic distrust setting postcolonial Nigeria up for structural failure and ethnic violence.

Cody Olson, University Scholars

Jeff Hunt, mentor

Rationality, Theatricality, and Identity – The Enduring Attributes of Hippocratic Medicine

Hippocratic philosophy, originating in the 5th century B.C.E., has maintained an enduring influence over the practice of medicine for over two millennia. This thesis argues that three core Hippocratic principles—rationality, theatricality, and identity—have shaped modern medicine in a particularly interesting fashion. Rationality fostered the separation of medicine from other forms of magico-religious healing. It also promoted the educational reform and therapeutic advancement characteristic of the Hippocratic physicians. Theatricality in medicine developed from the physician's need to inspire awe and confidence in his patient base. The performative behavior and symbols that helped ancient physicians build rapport have analogs in modern medicine. Finally, the Hippocratic Corpus and the Oath in particular set a precedent for the sense of personal ownership the physician should feel for their craft. It demonstrates that the responsibility of a physician influences their behavior in both professional and private affairs.

Sidney Ortego, University Scholars & Philosophy

Todd Buras, mentor

Human Personality Revealed through Love and Suffering: A Thesis Comparing the Personalist Philosophies of Martin Luther King Jr. and Karol Wojtyla

Martin Luther King Jr. spent his life advocating for the dignity of all people. King's idea of human dignity was informed by his Christian spirituality and his study of personalism—a school of philosophical thought that asserts the centrality of the person in the pursuit of truth. Throughout King's intellectual formation and social activism, he affirmed the important role of love and suffering in the Christian life. Likewise, Polish philosopher Karol Wojtyla—also known as Saint Pope John Paul II—was a Catholic human rights activist in the 20th century that inspired many with his teachings on the dignity of the human person and the appropriateness of love, and the sacrifice it requires, to the nature of the person. In this thesis, I will argue that each thinker has comparable and noteworthy reflections on the meaning of personhood that merit serious attention for Christians seeking to respect the dignity of God's marvelous creation: man.

Emmalyn Oscarson, International Studies & Anthropology

Joan Supplee, mentor

Examining the Effect of Domestic Legislation on Human Trafficking in El Salvador, Guatemala, and Honduras

This thesis aims to examine the effectiveness of domestic legislation in addressing human trafficking in El Salvador, Guatemala, and Honduras. Through a comparative analysis of the legal frameworks and their implementation in the three countries, this study seeks to identify the gaps and challenges in the legal system that allow for human trafficking to persist. Data was gathered from U.S. Department of State Trafficking in Persons Reports between the years 2011 to 2021. The statistics evaluated for each country were human trafficking investigations, prosecutions, convictions, rate of convictions, and rate of prosecutions. The analysis shows varying correlations in El Salvador, Guatemala, and Honduras, as governments do not report all statistics for every reporting year. For instance, the ratio of convictions could not be obtained for Guatemala for three years because the government did not collect the data. Each country made legislative progress; however, there is insufficient statistical evidence to support the effectiveness of the laws. Human trafficking is a complex issue with various factors and influences. The findings are expected to contribute to the understanding of the strengths and weaknesses of domestic legislation in addressing human trafficking in Central America and provide recommendations for strengthening the legal framework and enhancing its implementation.

Claire Owens, Finance

Shane Underwood, mentor

To the Moon or Destined for Doom: A History of Blockchain Technology and Guide for Investing

In the past decade, there has been an explosion of interest centered around the viability, volatility, and future of blockchain technology. The optimist argues that cryptocurrency will replace any nation-backed currency and soon almost all technology will be blockchain backed. On the other hand, the skeptic argues that cryptocurrency is worthless asset class and is effectively a ticking time bomb that offers no material value. As recent years have shown, some nations believe that cryptocurrency can be the solution to high inflation, corruption, and lengthy payment times, while other individuals have lost millions due to blockchain hackers and see it as untrustworthy and dangerous. In the midst of the controversy, many private investors have flocked to the blockchain industry for investment without a sound idea of what to screen for. It has become all the clearer that a cohesive understanding of blockchain capabilities and suggested benchmarks to value investment is needed going forward. A holistic view of the team, company fit within the ecosystem, and use of blockchain technology must be analyzed to offer a

sound basis for investment.

Nate Padley, University Scholars

Richard Jordan, mentor

The Problem of Greatness in Modernity

In the *Nicomachean Ethics*, Aristotle provides a description of a great-souled man. By analyzing this description and the lives of three of the greatest of the ancients, Sulla, Alexander, and Pericles, I propose an understanding of classical greatness. I then contrast this greatness with the type of political leadership that tends to dominate modern democracies: the middle-manager leader foretold by Tocqueville and described by Weber. To explain the decline of greatness in modernity, I examine the works of Machiavelli, Bacon, and Hobbes to show the ways in which modern political theory has undermined classical greatness. Next, I use the lives of Abraham Lincoln, Winston Churchill, and Charles de Gaulle to show that greatness is still possible in modernity, but that it differs from the classical model expounded by Aristotle. Finally, I place the three great ancients and the three great moderns that I have chosen as examples into side-by-side comparisons to show the similarities and differences between classical and modern greatness.

Yenna Park, University Scholars

Lakia Scott, mentor

A Hidden Minority: Voicing Asian Americans in U.S. History TEKS

The COVID-19 pandemic brought to light Asian hate crimes because of the decision to scapegoat Asian Americans as the cause of the pandemic. While this is far from true, this highlighted event draws out a deeper question regarding Asian Americans and their place in American society. Specifically, questions developed regarding how people perceive Asian Americans, and much of their perception can be traced back to the way they learned in school. Further tracing of this leads to the questioning of the curriculum itself, the foundation and outline for what people are expected to learn as they grow up in school. This thesis explores the extent to which Asian Americans and Asians are represented in the Texas Essential Knowledge and Skills §113.41, United States History Since 1877. By using AsianCrit, this thesis evaluates the consequences of limiting the Asian American voice in curriculum and offers opportunities for inclusion to advocate for change.

Ryan Parker, Anthropology

Jeff Levin, mentor

Calm Amidst the Storm: The Role of Religious Health Assets During the COVID-19 Pandemic

The Religious Health Assets framework was created by Gary Gunderson and James R. Cochrane to call attention to the myriad of ways that public health can optimize the potential for health promotion inherent in religious communities. Throughout the COVID-19 pandemic, the need for such collaboration between religion and public health institutions has come increasingly to the forefront. While previous survey-based studies have been conducted regarding the effect of COVID-19 on congregations, there remains a need to assess pandemic experiences of church leaders with regards to the religious health assets of congregations in respective communities. This qualitative study was designed in order to evaluate how local Christian leaders and congregations in one community have served as assets to public health promotion and implementation throughout the COVID-19 pandemic. After conducting seven semi-structured interviews with local pastors and priests, three key themes emerged: the pandemic as a time for forced adaptations, the church's ability to provide resources to congregants and the community, and the difficulties of pandemic-related decision-making for church

leaders. These themes made clear that the primary ways in which churches served as public health assets during the pandemic were by contributing to the “leading causes of life” of their congregants and by providing an important source of human capital.

Harsha Pathanjaly, University Scholars

Janet Bagby, mentor

A Qualitative Study on Music Therapy and Children with Down Syndrome

The research on music therapy, especially in regard to children with Down Syndrome, is relatively new and upcoming. This study presents a qualitative interview analysis of individuals who are licensed music therapists. They were recruited to discuss their experience in witnessing how music therapy affects the development of children with Down Syndrome. In the responses collected from three music therapists through a snowball sampling method via phone calls and emails, three separate domains were defined and highlighted: communication delays, layout of therapy sessions, and behavioral changes. The three domains were present in the experiences shared of all three music therapists. Further, the findings have a larger implication on society and for the importance of future research.

Allyson Pechacek, Psychology

Stacy Ryan-Pettes, mentor

Social Connectedness & Athletic Involvement as Moderating Factors in Early Adolescent Suicidality Through the Reality vs. Aspiration Latent Construct of Zhang’s Strain Theory

Suicide rates among children ages 10-14 have dramatically increased since the early 1960s. In addition, the COVID-19 pandemic resulted in a spike in reported suicidality among this age range. Despite increased rates, there is still limited research on child suicidality and no evidence-based treatment. While the Diathesis-Stress Theory and the Interpersonal Theory have primarily driven research within this specific area, Zhang’s emerging Strain Theory takes into account the limitations of previous theories that have dominated the literature. However, Zhang’s Strain Theory is relatively new and needs validation. The purpose of this study is to test a portion of Zhang’s Strain Theory to determine whether suicidality moderators that have been previously validated within the literature, social connectedness and athletic involvement, moderate the relationship between strained personality represented by the Reality vs. Aspiration latent construct and suicidal behavior among children. We hypothesize that Reality vs. Aspiration will be related to suicidal behavior such that the more there is a gap between reality and aspiration the higher the likelihood that suicidal behavior will occur. However, this relationship will be moderated by athletic involvement and social connectedness such that higher athletic involvement and social connectedness are going to weaken the relationship between Reality vs. Aspiration and suicidal behavior. To test our hypothesis, we will be conducting a moderation analysis using data from the Adolescent Brain Cognitive Development (ABCD) study. Should our hypothesis be supported this study will exhibit validity of a portion of Zhang’s Strain Theory and provide support for further research as well as funding for activities that foster social connectedness and/or athletic involvement.

Veronica Bonifacio Penales, International Studies & Professional Writing and Rhetoric

Sara M. Dye, mentor

THE EFFICACY OF PROTESTS: Analyzing Protest Work at Baylor University through the Lens of Historical Student Activism

Protesting, as a vehicle to showcase public opinion on inadequate and unjust public policy, is necessary to participation in democracy. In this thesis I first provide a collection of protest work that tells the story of my

student activism in the realm of sexuality, gender, and gender identity rights at Baylor University, in Waco, Texas, and across the nation. Secondly, I provide an analysis of three historic student-led protest movements: the Greensboro Sit-Ins of the 1960s Civil Rights Movement, the Kent State Massacre of the anti-war efforts of the Nixon Administration, and the March for Our Lives Movement resulting from the shooting at Marjory Stoneman Douglas High School in Parkland, Florida. Through this analysis, I establish three points that are necessary for the efficacy of student-led protests: an existence of public opinion with influence over policy, a saliency of the issue being protested, and an addressing of outside factors that have potential to outweigh the influence of public opinion. Finally, I examine my protest work in light of these three points to assess its effectiveness.

Riley Peterson, Religion

Jeremy E. Uecker, mentor

Education and Capstone Marriage

Many have noted the substantial changes which have occurred in the American family over the past half-century, including a decreasing birthrate, shifting attitudes towards gender and sex, and a rising median age at first marriage. While opinions differ about whether these changes have been positive, it is clear that a significant and underspecified relationship exists between delays in marriage and higher education's expanding role in facilitating the transition to adulthood. While some emphasize the predominant role of the "capstone" model of marriage in delaying marriage in general, others have pointed out that significant differences in marriage schemas exist along educational lines. To help clarify these tensions, I completed a cross-time analysis of 6 premarital expectation variables from the National Study of Youth and Religion (NSYR) and found that capstone marriage schemas are particularly strong and stable among those who complete just a bachelor's degree and marry, but are less predominant more generally, especially for those in other educational trajectories, particularly as they get older and as they marry. These findings demonstrate some key limitations of the capstone model of marriage, namely, that such ideas about what must be accomplished prior to getting married may not be so all-encompassing for many, if not most, young people in America.

Samuel Pettit, University Scholars

Mark Olsen, mentor

Spectator

My project is a short novel called *Spectator*. It is about a man named James, who commits suicide in the prologue and has an out of body experience following his jump from a bridge. In each chapter, James inhabits (or spectates) people in his life. This experience allows him to see himself and the past through the eyes of others. It also allows the reader to see how he got where he did in life. James believes that everyone he loved has abandoned him, but through seeing their sides of the past, he learns that they have been there for him all along. The novel is inspired by several postmodern themes and philosophies. These influences make up a bulk of the research paper associated with the novel. One major postmodern characteristic is the removal of a metanarrative. The general story of the novel takes inspiration from the type of story found in *A Christmas Carol* and *It's a Wonderful Life*. However, in each of these tales, the protagonist is guided through an out of body experience by some spiritual force. I have intentionally decided to remove these guides from *Spectator*. James must stumble through on his own, making meaning for himself out of the experience. The major themes explored in the thesis are grief, regret, friendship, and self-forgiveness.

Travis Picco, University Scholars

Steve Block, mentor

Aborting Precedent: A Review of the Dobbs v. Jackson Women's Health Organization Decision

In June of 2022, the United States Supreme Court announced a decision to abandon the abortion precedents established by *Roe v. Wade* and *Planned Parenthood v. Casey* in favor of new standards on abortion regulation and permissibility. The Court, through its ruling in *Dobbs v. Women's Health Organization*, discarded almost 50 years of long-standing case law and returned the power to regulate abortion procedures at any and all stages to the state. While proponents of the decision agree with the Court's reasoning, many opponents argue that the abdication of precedent is unwarranted and dangerous. This thesis reviews the *Dobbs* case in its entirety with sections dedicated to the issue's history, the majority opinion, and the dissenting opinion; finally, the decision is analyzed from a legal standpoint to determine if the Court was justified in its decision to overrule *Roe v. Wade*.

Raychel Polk, Political Science

Patrick Flavin, mentor

The Impact of Political Polarization on Political Participation

American politics has become increasingly polarized throughout history at varying levels. Humans are naturally engineered to take caution of others they feel are competition, even if there are few differences amongst them physically or ideologically. If differences are inherent no matter which political party you are in, why do we criticize them rather than embrace them? In order to embrace them, we need an understanding of what political polarization is good for. To understand this, I conducted qualitative interviews of participants. I analyzed the ways in which their perceived political knowledge affected how politically involved they were and most importantly the level of dislike they had for the political party they deemed to be their opposer. The conclusion I found is that the greater your perceived political knowledge is, the more likely you are to be politically involved and politically polarized. However, your perceived political knowledge is not always your actual level of political knowledge. Through a political examination, I compared their perceived and actual level of political knowledge to solidify its effect on political polarization and political participation.

Natalie R. Randall, University Scholars, History, & Latin

Davide Zori, mentor

Lār and Doctrina: Pastoral Care in Anglo-Saxon and Anglo-Norman England, 990-1135

Pastoral figures' care of their people, particularly through active preaching or other communication with those under their authority, shifted in language, priority, and view of previous generations' work through the late Anglo-Saxon and early Anglo-Norman period in three main stages, which this thesis analyzes through translation and study of four sermons and homilies by Aelfric of Eynsham and Wulfstan of York, a series of letters by Lanfranc of Bec, and a letter and a sermon by Osbert of Clare, as well as secondary research. It especially explores pastoral figures' treatment of "right learning," or "doctrine," through the decades, which is particularly salient as it intersects with questions of language and audience (who should be exposed to it?), priority (whence or from whom does it come?) and view of previous generations (did they have it?). I find that the replacement of bishops after the Norman Conquest marked a turning point in leading figures' vision of pastoral care, away from such reverence for vernacular exegetical and catechetical sermons and homilies and toward Latin writings on liturgical and ecclesiastic, or even political, concerns; yet a concern that their audience abide in "right learning" endured.

Harrison Rennie, Medical Humanities

William G. Hoy, mentor

Determining Individual Motivations for COVID-19 Vaccine Uptake among Luo People in Rural Western Kenya: A Grounded Theory Study

Vaccination is a central element of the global effort to end the ongoing COVID-19 pandemic. The pandemic has caused thousands of deaths across Kenya and led to widespread social and economic disruption over the last three years. Early surveys in Kenya of COVID-19 vaccine uptake rates and individual motivations for vaccination neglected low-income rural communities with limited educational attainment in favor of urban populations (Marzo et al., 2022). This study examines the motivating factors that lead Luo people in rural western Kenya to accept or refuse COVID-19 vaccines. Additionally, it investigates the group's attitudes towards COVID-19 vaccination. Semi-structured patient interviews were conducted at a rural clinic on the Nyakach Plateau in southern Kisumu County in May 2022. A grounded theory methodology was selected to maximize adaptability towards individual perspectives. Rather than impose a strict framework on subjects by predicting potential responses, the reported experiences of the individuals guided further questioning. Factors motivating respondents most strongly to receive vaccines included government regulations and messaging, along with desires to receive personal protection against infection and to prevent the spread of COVID. By retrospectively evaluating motivations for vaccination, healthcare professionals and public health authorities can adjust their messaging strategies to increase vaccine uptake and confidence. While the generalizability of a single-facility study is limited, utility to the local community is increased by eliminating extraneous influences. Specific limitations included interview brevity and reliance on Luo-English translation.

Lizzy Rice, English & Corporate Communication

Jason Whitt, mentor

The Construction of Type 1 Diabetes as an Invisible Disability from a Medical, Societal, and Theological Perspective

Invisible disability refers to disabilities that are more inconspicuous allowing people who identify under this term to better blend into everyday society. Type 1 Diabetes, an autoimmune deficiency affecting the pancreas' ability to produce insulin, is considered an invisible disability, but little research has been conducted to explore the impact of Type 1 Diabetes as an invisible disability in terms of identity. This thesis argues that the Type 1 Diabetic identity is constructed from three main perspectives—medical, societal, and theological. The medical perspective introduces and centers around the rhetoric of control and its usage by medical professionals and the biotechnology communities when advertising Type 1 Diabetic equipment. The societal narrative focuses on the rhetorical effect of the similar naming of Type 1 and Type 2 Diabetes and how it contributes to the notions of control and management. Lastly, the theological perspective offers an alternative narrative for the Type 1 Diabetic identity based upon an exegesis of Psalm 23 and the usage of story.

Robert J. Ridder, Psychology

Sarah A. Schnitker, mentor

Social support moderates the relationship between extracurricular activity participation and depression, anxiety, and stress symptoms in college students

Research has found that both extracurricular activity participation and social support minimize symptoms of depression and anxiety in college student populations. However, no studies have examined the relationship between social support and extracurriculars in predicting mental illness symptomology. We collected self-report data from a sample of college seniors ($N = 607$) at a private Christian institution on levels of involvement in various extracurricular activities, perceived social support from both adults and peers, and depression, anxiety, and stress symptoms. Main effects indicated that sport/exercise participation and peer social support were inversely associated with all three mental illness symptoms. Moderated regression analyses found three significant interactions that were inversely associated with mental illness symptomology. Staff social support moderated the relationship between church attendance and depression, faculty social support moderated the relationship between socializing with friends and anxiety, and non-university affiliated adult social support moderated the relationship between sports and exercise and anxiety symptoms. Results suggest that the mental health benefits of participating in certain activities may be enhanced by different sources of social support. Implications for leaders in Christian higher education are discussed.

Alexa Rollow, Religion & International Studies

Elise Edwards, mentor

Death as a Model of God

Feminist theologian Sallie McFague's book *Models of God: Theology for an Ecological, Nuclear Age* highlights the need for a variety of imagery to represent the divine. In light of her work, this thesis proposes death as an abstract, communal, and genderless model of God to supplement the feminine metaphors McFague proposes. The first chapter examines McFague's work and lays the theological framework necessary to present death as an influential model of God. Chapter Two utilizes three questions from McFague to examine the death model's legitimacy in Christian theology and ethics. Chapter Three then discusses how the western Protestant approach to God informs Protestant perspectives on death. The fourth chapter concludes this thesis by outlining the characteristics of the divine that the death model highlights as well as the death model's place within Protestant theologies. Drawing on a variety of theological books and journal articles, with special attention given to McFague's work, this thesis presents death as a powerful supplementary model of God in an ecological, nuclear age.

Sai Sagireddy, Economics

Lauren Barron, mentor

Endophthalmitis patterns in the COVID era after intravitreal injections (IVI) with the implementation of universal masking

The COVID-19 pandemic has forced scientists to develop strategies (including universal masking) in order to reduce transmission of the virus. While masking has helped control infection rates during the pandemic, it has also helped the ophthalmology community discover important findings. This study evaluates the role of masking (primarily) and other COVID-19 mitigation measures on the occurrence of post-injection endophthalmitis at the Retina Northwest Group clinics. Patients receiving intravitreal injections between March 2018 and March 2020 (pre-COVID), and patients receiving intravitreal injections between March 2020 and March 2022 (COVID) were included. A total of 102,634 intravitreal injections were performed during the study period (52,214 pre-COVID and 50,420 COVID). A total of 8 cases of acute endophthalmitis occurred in the pre-COVID group and 3 cases in the COVID group. In this retrospective review, it was determined that masking and other COVID-19 mitigation measures are not associated with an increased risk of post-injection endophthalmitis.

Katherine A. Scheffrahn, Neuroscience

Stephanie Boddie, mentor

Acupuncture Research and Racial and Ethnic Minority Groups in the United States: A Scoping Review

First discovered in China 3,000 years ago, acupuncture is a treatment where a practitioner inserts small, sterile, stainless-steel needles into the patient's skin at specific points. The manipulation of these acupuncture points influences the patient's body through various mechanisms. In the United States, acupuncture is widely used, with approximately 10% of all Americans having experienced acupuncture at least once in their life. Research has demonstrated acupuncture to effectively treat multiple conditions such as allergies, depression and anxiety, chronic pain, post-operative pain, fibromyalgia, menopausal hot flashes, infertility, and more. The research and practice of acupuncture has grown significantly over the last few decades, which necessitates an examination of whether researchers have successfully represented populations who have been historically overlooked in medical research. The purpose of this scoping review is to assess the existing literature on acupuncture and racial and ethnic minorities in the United States and to identify knowledge gaps and future research priorities.

Rebekah Sharp, University Scholars

Elizabeth Marvel, mentor

The Creation and the Fall: An Intellectual History of Women in Church Leadership

Evangelical organizations like the Southern Baptist Convention (SBC) have recently made headlines for their strong positions against women in the pulpit. However, the debate on women in Church leadership is not a new one. The basis of the argument against women's ability to lead has evolved, stagnated, and then evolved again. This thesis will analyze primary sources from Ancient, Medieval, and Reformation eras, attempting to trace how attitudes towards women's ability to lead have changed or stayed the same. Specifically, this paper will focus on the primary sources analyzing Genesis's creation and fall stories. By analyzing the work of male philosophers, theologians, pastors, and female martyrs, anchoresses, and lay women, I will aim to trace an intellectual history of the creation, the fall, and the implications this has on female leadership in the Church.

Alice Shelly, Medical Humanities

Jeff Levin, mentor

The Impact of A Meditation and Mindfulness Practice: Perspectives Across Religious Traditions

Meditation and mindfulness practices have a longstanding history of use, both across religions and among secular individuals. Over the past two decades, substantial peer-reviewed research has been published on the benefits of such practices for health and general well-being. This thesis documents the history of the modern mindfulness movement and its impact on the lives of a sample of people of various religious identities. First, this thesis describes the emergence of mindfulness as a popular topic in the academic world, including a summary of the current research consensus on the benefits of meditation. The diversity of practices across selected religious traditions is also noted, exemplified by discussions of meditation in Judaism, Buddhism, Islam, Christianity, and Hinduism, as well as in secular mindfulness practice. Second, the experiences and benefits of meditation are documented through a series of interviews with five individuals, from diverse faith traditions, with decades-long mindfulness practices. These folks describe their experiences from the perspective of their personal religious backgrounds. Third, a discussion is provided of the common features within the respective narratives of the interviewees, comparing and contrasting how different people experience mindfulness and how it benefits their lives. Also discussed are ways that meditation may be relevant and beneficial to people seeking to develop or deepen a mindfulness practice or to understand a subject that is deeply ingrained in human spirituality.

Molly K. Shoemaker, Medical Humanities & Philosophy

Anne Jeffrey, mentor

The United States Opioid Crisis: A Bioethical Review of Policy from Two Perspectives with a Consideration of Opioid Use Among Pregnant Women

The United States has experienced a public health crisis in which opioid use, dependency, and overdoses have led to social strain and economic loss, leading to a developing body of research that looks into how to address the issue. In this response, there have been developments in treatment methodology as well as policies enacted in attempts to ameliorate the effects of the crisis. This thesis provides a history of the opioid crisis and pain management perspectives, taking a particular look at the intersection of opioid use among pregnant women. What follows is a bioethical review of policy from two frameworks: principlism and Catholic bioethics. Principlism appeals to the bioethical principles of beneficence, non-maleficence, justice, and respect for autonomy. The Catholic bioethics framework uses concepts of participation in change and common good bioethics, as described by Catholic ethicist Lisa Sowle Cahill. The final part of this work includes a compilation of considerations for future policy and research which is derived from the two bioethical analyses. These evaluative criteria are aimed at offering a positive proposal for future change, with special consideration of how to protect pregnant women experiencing opioid dependence.

Kaylee Smith, Music Education

Kelly Hollingsworth, mentor

Elementary Music Teachers' Knowledge and Attitudes Toward the Use of Adaptive Materials for Students with Disabilities

Depending on the severity of students' disabilities, some students might require or benefit from general music lesson alterations. To create the least restrictive environment for students with disabilities, teachers must adapt, accommodate, or modify materials, space usage, time spent instructing, and instruction modality. This study aimed to survey regional elementary music teachers to discover their knowledge and attitudes toward the use of adaptive materials before and after a demonstration. Participants ($N=17$) attended a regional Texas Orff-Schulwerk workshop in March 2022. Each participant was a certified elementary music teacher in Texas. Survey questions included teaching experience, the prevalence of disabilities in their classrooms, and familiarity with adaptive tools. Following the pretest, the researcher explained the definition of adaptive materials and their purpose, along with providing information regarding the current literature's findings on adaptive materials. To assess the effectiveness of a demonstration on educator perceptions of adaptive materials in the elementary music classroom, a dependent sample t -test was conducted. Results showed that a demonstration effectively increased educator knowledge and improved attitudes towards adaptive materials. Further research is needed on student response to adaptive materials in the classroom.

Annabelle Snyder, University Scholars

Steve Block, mentor

"I am the queen; I'll kill Orual too": Monarchy and Commentary in C.S. Lewis's Till We Have Faces

Through his novel *Till We Have Faces*, this thesis examines the ways that Christian author C.S. Lewis comments on monarchy. We use the characters from this retelling of the legend of Cupid and Psyche to critique and comment on the perspectives of Aquinas in *De Regno* and Machiavelli in *The Prince*. We find that Lewis' answer to the question of monarchy is firm, yet subtle. In fact, Lewis does not completely align with either the classical or modern prescriptions of monarchy; however, he finds monarchy to be an ideal structure for government because it models the Kingdom of God. This said, we also argue Lewis believes that without proper safeguards accounting for humanity's fallen nature, kingship can be dangerous for invested parties.

Eden St. Dennis, University Scholar

David Smith, mentor

If You Give an Etonian a Commission: Education and Adaptability in the British Army

This thesis intends to prove that British boarding school education sabotaged the adaptability and creative thinking skills of students, leading to a dearth in strategic/tactical ability among high-ranking British commanders. This lack of ability became especially dangerous during campaigns against non-Europeans. To do this, the thesis explores a variety of case studies grouped under three main headings: generals who received minimal education, generals who attended prestigious public schools, and generals who attended military training academies. The thesis then analyzes their performance when conducting campaigns against non-European opponents. The primary sources used are journals, diaries, family histories, handbooks, sermons, speeches, magazines, and royal commissions. The thesis begins with an overview of the public-school education system and its history, then proceeds through three chapters of case studies in the order mentioned above. It ends with a brief conclusion summarizing the results of the research-- namely, that public school education tragically hampered British generals' command ability.

Julia Stephen, Neuroscience

Paul Carron, mentor

Broadening the Path to Self-Actualization through Systematic Changes to Maslow's Hierarchy of Needs

In the field of humanistic psychology, self-actualization is the highest component of Abraham Maslow's Hierarchy of Needs because it involves the realization of one's potentialities. The feeling of contentment that stems from fulfilling this need is unparalleled to any other accomplishment throughout one's life. However, the structure of Maslow's limiting hierarchy does not allow many individuals from attaining this state of bliss. In this thesis, I propose a new structure that appropriately prioritizes self-esteem and provides the framework for developing healthy relationships. Aristotle's theory of friendship and self-love in *Nicomachean Ethics* supports the claims against Maslow's limiting hierarchy. Mary Ainsworth and John Bowlby's Attachment Theory also corroborates the critique by providing more information on the development of self-esteem. The goal of the new structure is to realign the hierarchy with the goals of humanistic psychology and make self-actualization more feasible by providing flexibility within the system.

Natalie Stitt, University Scholars

Winter Rusiloski, mentor

Disability and Portraiture: Ethical Portrayal of the 'Other'

This project can be restrained to the exploration of three questions: how has disability been presented in art and media? What are we losing if it is 'othered' and excluded? How can disability be ethically portrayed in art? The aim of this project was to highlight the humanity of disability and to discuss what will be lost if spaces, specifically artistic ones, continue to be closed off not only to the representation of those with disabilities but their actual presence. As a creative thesis, this exploration is structured in two parts, a series of six portraits and a written component. With three large scale portraits and three smaller portraits, the painting component seeks to encapsulate the humanity and personality of the subjects painted. The written component traces a brief history of disability's representation, offers a synopsis of artists who have challenged the stereotypes surrounding disability, and presents a philosophical analysis of disability studies, its relationship with portraiture, and consequently how an artist should ethically portray disability in their work.

Eliana Stromberg, University Scholars

Julie King, mentor

Marketing Practices in the Fossil Fuel Industry: Shaping Policy and Public Understanding

Beginning in the mid-twentieth century, scientific research and major ecological events highlighted the necessity for innovative environmental policy to protect human health and the environment. Growing research in this field established the process known as the greenhouse effect, which leads to marked climatic change. More frequent observations indicating the anthropogenic nature of climate change led to considerations of policies and regulations that address fossil fuel combustion due to its relationship to atmospheric greenhouse gas concentrations. Since the identification of this relationship, the fossil fuel industry has led efforts to spread doubt and uncertainty in climate science. Among these efforts are widespread “greenwashing” campaigns. More recently, these disinformation campaigns have shifted to those of “climate delay,” or efforts that aim to downplay the urgency in addressing anthropogenic climate change. Such campaigns have a known impact on consumers and may be subject to regulation by the Federal Trade Commission for their unfair and deceptive nature. The breadth of these efforts reveals the extensive influence of the fossil fuel industry on political institutions, the economy, and most importantly, the public.

Micah Stull, University Scholars

Todd Buras, mentor

Defining Death: A Christian Perspective on the Limitations and Implications of Brain Death

The redefinition of death in the 1960’s from the cardiopulmonary approach to the whole brain approach is cause for careful ethical analysis by Christian philosophers. This thesis investigates the history and philosophy behind this shift in the definition of death and how we should regard it as Christians. The invention of the ventilator and the proliferation and acceleration of organ transplants were two of the driving forces for this change in definition, which places philosophers in a dilemma who tend to think of “redefinitions” necessary for *wrong* definitions and not simply *inefficient* ones. After examining the brain death definition of death, the thesis will explain why the redefinition was necessary and yet questionable, and also how it is the best definition we have to date. The thesis will then propose a potential solution to the problem in organ donation that is caused by this redefinition.

Benjamin Suhl Borbón, University Scholars

Thad Scott, mentor

The Effects of Nutrient Loading on Microcystis HABs in a Eutrophic Lake

Harmful Algal Blooms (HABs) are a growing problem, and nitrogen and phosphorus are the key nutrients that control their growth. Human activities, such as agricultural runoff and climate change, contribute to HABs. High-nutrient lakes favor cyanobacteria--the root cause of HABs; in this study, we investigate the growth of *Microcystis*, a cyanobacterium species responsible for creating HABs in Lake Fayetteville. The study aims to examine the effects of nutrient loading on *Microcystis* growth and microcystin concentrations, with a hypothesis that internal nutrient loading plays an important role in addition to external nutrient loading. The results may aid in developing effective management strategies for controlling cyanobacteria growth and mitigating public health risks.

Amoli Tadiparthi, Biology

Elisabeth Vichaya, mentor

Effects of Streptozotocin-Induced Diabetes on Astrocytic Activation in the Hippocampus & Hypothalamus

Diabetes is a metabolic disorder associated with insulin dysregulation affecting over 422 million people worldwide. This dysregulation leads to hyperglycemia, or high blood glucose, which is associated with various comorbid diseases including depression and Alzheimer's Disease. These comorbidities are presumably associated with hyperglycemia-induced brain changes. Given the role of astrocytes in glucose uptake, they provide a logical target. However, the data regarding their response is mixed. I sought to determine if astrocytes had increased reactivity at a time in which the lab observes behavioral changes. Specifically, I evaluated GFAP staining of healthy control, STZ-induced hyperglycemic, and (as a positive control) lipopolysaccharide treated mice. I hypothesized that hyperglycemia would increase astrocytic reactivity in the hippocampus. However, the data indicate a trend toward a decline in astrocytic reactivity. Further research is necessary to determine if this observation indicates that the astrocytic response to hyperglycemia is time-dependent or if the behavioral changes are driven by other cell populations.

Michelle C. Tan, University Scholars

Scott H. Moore, mentor

Hope as a Healer: The Role of Hope and Suffering in Physician and Patient Relationships

In order to explore the role of hope and suffering in physician and patient relationships and to shed light on new aspects of the patient's human nature that are absent in traditional science education, analysis of classical literature and a comparison of texts were completed. Through an effort to gain understanding of suffering and its causes, followed by the patient's reaction to such, it was found that hope has a crucial role in a patient's healing and willingness to live. The physician is responsible for maintaining hope while being attentive to the patient's physical needs. For physicians to uphold this duty, emphasis should be placed on a patient's mental and spiritual wellbeing as well as his physical wellbeing. The knowledge presented in these texts holds valuable information on understanding human nature and suffering that can be applied to medicine. By embracing these works, society can begin to take essential steps to transform healthcare into its greatest potential.

Afton E. Tanner, University Scholars

Forest Kim, mentor

An Analysis of Patient Satisfaction in Religiously Affiliated Versus Non-Religiously Affiliated Hospitals

Despite a decline in funding there has been an increase in the percentage of religiously affiliated hospitals in the United States. However, there have been no studies to investigate the relationship between religious affiliation and patient satisfaction. This paper intends to analyze patient satisfaction scores of various ownership groups to discern what implications might exist for healthcare professionals. To answer this question, I looked at four different ownership groups: Religious Non-Profit, Governmental, Proprietary (for-profit), and Non-Profit Other. This study utilizes data from the Definitive Healthcare data set which includes nine different Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores. Because of the possibility of covariates impacting these HCAHPS scores it was necessary to isolate the impact of the ownership variable on the dependent variables, so we utilized the statistical method of propensity score weighting. Following the propensity score weighting, a linear regression was run to determine the influence of the ownership variable on HCAHPS scores. Proprietary hospitals performed worse on average in the HCAHPS summary scores. These findings suggest that on average Religious Non-Profit hospitals showed higher patient satisfaction than Proprietary hospitals.

Abbie Terrell, Science Research Fellows

Lorin Matthews, mentor

Complex Plasmas: A Computational Investigation of Self-Organizing Systems

Complex, or dusty, plasmas are ionized gases in which nanometer-to-micrometer sized microparticles are suspended. When dust particles are introduced in the plasma environment, they become negatively charged and interact with each other and the plasma background, self-organizing into stable structures. These far-from-equilibrium systems which require a continuous input of energy to maintain their stability serve as a useful model system to study processes of self-organization in other complex systems. This thesis focuses on the numerical modeling of the Plasma Kristall-4 (PK-4) experiment, currently on board the International Space Station, through an N-body Molecular Dynamics simulation called DRIAD (Dynamic Response of Ions and Dust). It is shown that the dust cloud undergoes a phase transition from liquid to crystalline that is studied quantitatively in three dimensions. The dust phase transition exemplifies the presence of analogous systems in physics, leading to a discussion of the relevance of studying physical phenomena through model systems.

Isha Thapar, University Scholars

Bryan Brooks, mentor

An Examination of Environmental Health Education in U.S. Medical Schools

The field of environmental health has risen to prominence in recent decades as research has illuminated the intrinsic connections between the environment and human health outcomes. Medical practitioners can play a vital role in the response to environmental health crises in terms of treating patients suffering from environmental disease, advising patients on preventative measures to reduce environmental exposures, and advocating for policy change to protect patient health and well-being. However, environmental health education is severely lacking in the United States, causing practitioners to be ill-equipped to be effective clinicians and patient advocates. A potential solution is to increase opportunities to pursue joint MD/MPH degrees with a concentration in environmental health, as well as increase advocacy/environmental health coursework in the medical school curriculum. In this paper, a detailed analysis of existing MD/MPH programs in the United States with a concentration in environmental health and related coursework in the core curriculum was conducted. Through this paper, we hope to underscore the need for environmental health education in medical schools across the nation to enable the improvement of public health outcomes.

Ruhi Thapar, University Scholars

Matthew Andersson, mentor

Burnout Across a Female Physician's Career: Manifestations of Burnout, Appraisal of Current Interventions, and Future Directions

Women in medicine hold a unique role both in their professions and society at large. Recently, there have been great strides in the representation of women in the medical profession. However, regardless of the rise in women entering the field, the socio-cultural phenomenon of burnout unfortunately disproportionately impacts these female physicians. In order to retain female physicians in the workforce and thus guarantee a bright future for the medical profession, it is essential to explore how burnout manifests across a female physician's career, as well as the nature of interventions that address this burnout. As compared to their male colleagues, female physicians are more vulnerable to certain factors which perpetuate burnout, such as lack of leadership opportunities, administrative burden, challenges with work-life integration, and loss of autonomy. This thesis will depict burnout as a cumulative process, manifesting in different ways throughout the stages of a female physician's career, from undergraduate education to their experience in the workforce. Furthermore, this thesis depicts interventions which address burnout at these stages, paired with a thoughtful appraisal of these interventions in an effort to identify strengths, as well as gaps where future research and implementation is necessary.

Gabrielle Thomason, Baylor Business Fellows, Finance, & Mathematics

Charles Walter, mentor

Organizational Resilience: Three Science Museums' Responses to COVID-19

When faced with unexpected challenges, nonprofit organizations must demonstrate organizational resilience. This concept refers to an organization's ability to respond and adapt to disruptive change while maintaining its identity and functionality. While the study of nonprofit resiliency tactics and their effectiveness is increasingly popular, there is a gap in the literature about the ways museums specifically react in times of crisis. Using the nonprofit framework given by Searing et al. (2021), this study aims to identify the resiliency tactics used by three science museums during the COVID-19 pandemic. The findings suggest that the resiliency tactics used by museums are similar to those of other nonprofits (e.g., long-term financial planning, building and maintaining staff trust, innovation, and collaboration), although specific financial and stakeholder considerations are unique.

Christopher Thompson, University Scholars

Greg Hamerly, mentor

Trading Fours with Mr. PC: Toward an Improved Model for Jazz Synthesis

Machine learning (ML) is a demonstrably effective method for learning pattern- and rule-based systems, such as natural language or music. This thesis identifies jazz improvisation as one such system and seeks to design an ML model for learning it. To this end, Mr. PC is an ML model capable of synthesizing novel jazz improvisation in a swing style. It was constructed using a state-of-the-art Transformer-XL architecture and trained with the hereunto unexplored Filosax dataset. The Transformer-XL architecture is a promising solution for inducing long-term structure in generated improvisation: a persistent challenge in the music generation literature. The quality of the generated improvisation is evaluated using both traditional music analysis techniques and quantitative fractal analysis. Further, the output is compared to that of a smaller, simpler model trained on the same data set to test the margin of improvement.

John Tia, Health Science Studies

Margo Shanks, mentor

Relationship Between Sex and Symptom Status in University Students Who Tested Positive for COVID-19

Due to the novelty of research involving differences in sex for COVID-19, more studies covering this topic are required. This study examines if there is a statistically significant difference between males and females in COVID-19 symptom rates. Data was collected during regular COVID-19 contact tracing, where upon positively tested students were contacted and asked to answer their sex and if they had symptoms present or not. Afterwards, a Chi-Square test was performed. The results designate that there is no statistically significant difference between the sexes ($p=0.703$). However, females exhibited higher incidence for COVID-19 symptomatic status (62.59%) than males (58.20%). In conclusion, there is no statistically significant relationship between sex and symptom rate; however, more studies in this topic would be appreciated due to its importance.

William Tia, Health Science Studies

Briana Cambra and Maria Boccia, mentor

Effects of Testing Positive for COVID-19 or Being in Close Contact with Someone Positive for COVID-19 on Anxiety Levels in University Students

With the rise of anxiety levels in college students because of the COVID-19 pandemic, it is becoming increasingly more important to study this phenomenon. This study investigates average anxiety scores between students in close contact with a positive COVID-19 case and students who are positive cases for COVID-19. It is hypothesized

that there will be a significant difference between the two groups due to each's different experiences. Anxiety scores were collected from students using the HADS survey. Then, a two-sample t-test assuming unequal variances (n=99) was performed to determine if a significant difference exists between the groups. Results revealed that there was no statistically significant difference (p=0.368). Despite this, a slightly higher mean anxiety score for close contacts (5.8) was analyzed from the test compared to positive cases (5.128). Future studies in this topic are encouraged due to its importance and the limited research involving it.

Doan Tran, Biochemistry

Jeff Levin, mentor

Physically Broken, Eternally Whole: Examining the Diverse Experience of People Living with an Ambulatory Disability Within Wholeness, Culture, and Spirituality

Physical limitations are the most common forms of disability. The daily lives of people living with this type of disability can be deeply challenging and complex as they navigate frequent challenges and inconveniences. Religion serves as a helpful coping mechanism for many of these individuals, according to a substantial literature of peer-reviewed studies. This thesis project first surveys the existing literature on religion and disability, as well as describing the primary teachings on disability of Islam, Hinduism, Buddhism, and Christianity. Next, a series of interviews are conducted with eight individuals with ambulatory disabilities who live in the United States, Vietnam, or the Philippines from Protestant, Catholic, Buddhist, or non-religious backgrounds. These interviews document the experiences and challenges that these individuals face, as well as the role of faith in coping with their limitations. Common themes were identified throughout these respective narratives. Finally, a discussion is provided of the implications of this study for churches, healthcare providers, and families, in order to better care for those living with a disability.

Madelyn Treat, History

Elise Edwards, mentor

"To Prevent Impurities": Abortion Ethics in Colonial New England

Today, many Americans are concerned with abortion ethics. This thesis considers how colonial Americans in late seventeenth and early eighteenth-century New England perceived and regulated the issue. After reviewing medical, legal, and religious texts from the time, I propose that colonial New Englanders generally viewed abortion as a non-issue, except when it was perceived as an attempt to hide sexual immorality. Records of court cases involving abortion further support this argument, as well as providing insight into women's experiences of sex and pregnancy. I conclude with a discussion of this history's relevance for the contemporary abortion debate, particularly regarding women's autonomy.

Kaitlyn Tremble, University Scholars

K. Leigh Greathouse, mentor

Bacterial Indole Production and Epithelial Barrier Function in Colorectal Cancer

Colorectal cancer (CRC) is the third most diagnosed cancer globally and second leading cause of cancer mortality, accounting for approximately 10% of annual cancer diagnoses and related deaths, with early onset CRC on the rise.

The intestinal epithelial barrier is the link between external processes of the microbiome and internal processes of the host system. Therefore, the development of intestinal diseases such as CRC spark questions as to the specific contributions and interplay between each side of this barrier; among them, what microbial metabolites might increase cancer risk and how the body's response might further contribute to carcinogenesis. This thesis explores the role of *Fusobacterium nucleatum*—a common member of the gut microbiome in both healthy and diseased states—in CRC pathogenesis through the action of indole metabolites. First, the nature and quantity of indole production by *F. nucleatum* is explored. Then, the response of human colonic epithelial cells is assessed via changes in proliferation and gene expression. Further elucidation of the relationship between *F. nucleatum*, indole metabolites, and the colonic epithelium could advance our understanding of the mechanisms behind pathogen behavior and its contribution to CRC pathogenesis.

Joseph Tully, University Scholars & Theatre Arts

DeAnna Toten Beard, mentor

Playwriting for Virtue Development: the original realistic family drama Mythos of Autumn and its influences from New Natural Law Theorists and American dramatic literature

Throughout time, stories have proved pivotal to establishing a virtuous soul. This thesis examines the different ways tragic dramatic literature, specifically works of modern, American realism, aid in moral formation. Utilizing Northrop Frye's foundational exploration of literary criticism, this thesis formulates a new framework of examining serious works of dramatic literature. Additionally, this framework reflects the ideals held by the New Natural Law Theorists, demonstrating the ways in which theatrical performances demonstrate this philosophy. Finally, this thesis contains an original play, which was written in the style of modern, American realism and intends to convey this philosophy.

Matthew Turner, University Scholars

Elizabeth Corey, mentor

Contemplation and Cinema: Cinema through the Lens of Michael Oakeshott

In recent years, the film industry has increasingly focused on entertaining blockbusters that preach a socio-political message. Especially since the Covid-19 pandemic emptied theaters, films have had a much greater chance of being made if they promise to fill the seats or "say something" about the perceived problems in society. Cinema as an art seems to have declined. Is there another way of approaching cinema, one which recognizes cinema's value as art? This thesis argues that there is a more philosophical approach to film. Drawing on the work of philosopher Michael Oakeshott, specifically "The Voice of Poetry in the Conversation of Mankind," this thesis argues that cinema is valuable in itself and that it is corrupted when it serves a subsidiary end such as profit or politics. The thesis begins by establishing an understanding of Oakeshott's "The Voice of Poetry," discussing the different modes of experience Oakeshott lays out, with poetry, or aesthetics, as his main focus. After establishing that cinema does indeed fit Oakeshott's description of poetry, the thesis discusses films that stray from this character, describing films made for entertainment or politics. The thesis then discusses specific examples of contemplative cinema, concluding with a consideration of the aesthetic and spiritual benefits of approaching film contemplatively.

Kaitlyn E. Vana, Mathematics & Slavic and East European Studies

Michael Long, mentor

Constructing the Georgian Woman: Female Identity in Soviet Georgian Film and Its Modern Implications

Throughout the 1950s and into the 1980s, Georgia's regional film studio was second only to Moscow in terms of

resources and quality output. Soviet Georgian film in particular distinguished itself through its portrayal of women. While most Soviet films used women and femininity to represent the Soviet Union in opposition to the 'patriarchal' Tsarist regime, Georgian Soviet cinema tended to maintain the autonomy of Georgianness through women. This thesis will examine the construction of female identity specifically through a thematic analysis of films and filmmaking in Soviet Georgia, focusing on post-WWII film to 1989, as well as examine how these constructs served as a unique asset in distinguishing Georgian culture amidst Sovietization. To substantiate this analysis, this thesis will contextualize the subject by revisiting the identity-building impact of 1920-30s Georgian silent film through literature review, followed by a survey of some of the most famous Georgian films including Mikhail Kalatozov's *The Cranes Are Flying* (1957), Tengiz Abuladze's trilogy, *The Plea* (1968), *The Wishing Tree* (1977), and *Repentance* (1984, released 1987), Lana Gogoberidze's *Under One Sky* (1961) and *Some Interviews on Personal Matters* (1978), as well as Otar Iosseliani's *There Once Was a Singing Blackbird* (1970) and *Falling Leaves* (1966). Lastly, this thesis will demonstrate how these constructs persevere in modern Georgia and continue to impact the current resurgence of Georgian cinema, which is predominantly being led by a cohort of female directors.

Bhaarathi Venkata, Biochemistry

Troy D. Abell, mentor

Sex-Specific Infant Mortality in the U.S.: 1995-2013

Infant mortality in the United States is significantly higher in comparison to other developed countries. The purpose of this study is to examine infant mortality over a period of twenty years and compare mortality trends between female infants and male infants while controlling for ethnicity, birthweight, and gestational age. This study utilized ten large-scale linked birth/infant death data sets ($n > 30,000,000$ births) and analyzed cumulative infant mortality, perinatal mortality, and neonatal mortality. The overall cumulative infant mortality across 1995-2013 decreased, and female infants demonstrated a lower cumulative infant mortality in comparison with male infants. Further assessment will focus on combinations of sex of the infant, ethnicity, birthweight, and gestational age in order to build more precise models that aid our understanding of ways to further decrease infant mortality in the U.S.

Rachel Walkup, Science Research Fellows

Cole Matson, mentor

*Rapid Adaptation to Anthropogenic Stressors in Gulf Killifish (*Fundulus grandis*) from Nueces Bay, Texas*

Nueces Bay, located in Corpus Christi, Texas, is a major center of oil refineries and other industrial activities and has significant levels of persistent pollutants including dioxins, furans, polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs). The gulf killifish, *Fundulus grandis*, is an estuarine species of fish that is known to inhabit Nueces Bay and the Gulf of Mexico and *F. grandis* populations from Houston, Texas have demonstrated resistance to PCB-induced cardiac teratogenesis due to a genetic deletion from a hybridization event with *F. grandis*' sister species *Fundulus heteroclitus*. In this study, *F. grandis* embryos spawned from individuals collected from two sites in Nueces Bay were exposed to varying doses of PCB-126 and then screened for heart deformities after 144 hours. Both populations displayed significant resistance to PCB-induced cardiac teratogenesis when compared to reference populations. This is only the second instance of a documented adapted population of *F. grandis* from the Gulf of Mexico. Additionally, Corpus Christi populations displayed lower basal and induced cytochrome P450A (CYP1A) activity indicating that a recalcitrant AHR pathway may be a plausible mechanism for PCB resistance. This would be consistent with previous observations in both resistant *F. grandis* populations from Houston, Texas as well as in populations of the sister species *Fundulus heteroclitus* which is used as a well-established model in evolutionary toxicology.

Sophia Webster, University Scholars

David Corey, mentor

Beauvoir and Butler on Gender: Gender's Definition, Origins, and Relationship with Sexuality

This thesis answers the questions of how Simone de Beauvoir and Judith Butler understand gender, its origins, how it functions, and its relationship to sexuality. Beauvoir and Butler similarly argue that gender is a social construction, and Beauvoir sees gender as a historical development. Butler argues that biological sex is a gendered construct, while Beauvoir believes it has some connection to gender, although she argues that sex and gender are separate concepts. Butler defines gender as a performative act, while Beauvoir examines gender through the concepts of Subject and Other. Gender connects to sexuality in different ways according to the two theorists. Butler and Beauvoir both see society's standard of heterosexuality as a way to reinforce gender roles, but Butler adds the idea of a heterosexual matrix that works to maintain a traditional construction of sex, gender, and sexuality.

Samantha Whitney, Baylor Business Fellows & Economics

Michael Richards, mentor

The Anesthesiologist's Responsibility to the Market: An Economic Analysis of Intravenous and Inhalation Anesthesia's Effect on Patient Cognitive Outcomes

Spending on anesthetics in the healthcare market has steadily increased with little to no evidence of proportional improvements in patient outcomes. Investigations into this phenomenon illustrate that the effect of common complications are often minimized when considering treatment plans. Using QALY (Quality Adjusted Life Year) metrics and data on the frequency and cost of Post-Operative Cognitive Dysfunction, this research presents a comparative analysis of inhalation and intravenous general anesthesia methods. Each method is analyzed for their respective opportunity costs to the patient and to the greater healthcare system. The economic impact of Post-Operative Cognitive Dysfunction (POCD) for both anesthetic methods is discussed to highlight the long-term costs that are typically neglected in the healthcare market. Finally, this thesis suggests an economically efficient course of treatment, examining the role of the clinician in advocating for cost-effective healthcare options in surgical care and evaluating the various policy approaches to minimizing costs while maximizing care.

Anna Williams, Management, Russian, Eastern European & Slavic Studies

Steven Jug, mentor

What the West ~~Wants~~ Needs to Hear

Historical narratives must be continuously revised as research brings new information to light. While there is a large amount of scholarship surrounding Ilya Ehrenburg and his writing, there is very little about his work in *Soviet War News*. Ehrenburg's *Soviet War News* articles provide insight into how he tried to use his unique personal background to advance Soviet narratives in the West. Comparing Ehrenburg's World War II writing for a Soviet audience versus a Western audience shows what Ehrenburg believed the West wanted (or needed) to hear at different stages of the war. This new analysis gives historians a fresh perspective on World War II from a Soviet point of view.

Fiona Williams, Communication Sciences and Disorders

Melinda Nielsen, mentor

Exploring the Spiritual Aspect of the Use of Needlework to Create Marian Art

I am writing my thesis on the use of needlework to create Marian art and exploring the spiritual aspects behind the piece and its creation. My goal is to come to a conclusion about the artistic and spiritual experience I had with creating Marian art as a woman using a historically feminine medium, highlighting the history and significance of the craft in my writing and creating my own Marian embroidery piece. In this thesis I will explore embroidery's

association with craft, discuss the separation of fine arts from other crafts, and then embroidery considered as a woman's craft and its association with women. I will also discuss the translation of mediums into each other. As part of this thesis I will be taking a Marian artwork that was originally a painting and subsequently a print and now I am translating it into a textile form of art- embroidery. I will also expand on the different experiences to be had with each medium, both in creation and appreciation. At the end I will tell the readers of my process and both my interpretation of the art piece and how I would guide them in their interpretation of this art piece.

Nicole Wire, Psychology

Thomas A. Fergus, mentor

The Role of the Mood-as-Input Model in Explaining Not Just Right Experiences

Not just right experiences (NJREs) are situations that produce a subjective feeling that things are not how they should be, and they have been important in contributing to our understanding of the causes of repetitive behaviors observed in obsessive-compulsive disorder (OCD). They are often associated with significant distress and unease especially in individuals with OCD. Therefore, this study aimed to apply the Mood-as-Input (MAI) model to explain the development of NJREs by determining if an elevated negative mood and 'as many as can' stop rule could increase the likelihood of experiencing NJREs and more distressing NJREs. Participants were Baylor University undergraduate students who were randomly assigned to be induced with a positive or negative mood and then performed a proof-reading task according to a randomly assigned stop rule (i.e., as many as can or feels like continuing). Subsequently, participants reported whether they experienced a NJRE and rated the severity of it. No one combination of mood and stop rule increased the likelihood of experiencing NJREs ($\chi^2(3) = 1.88, p = 0.597$) or more distressing NJREs ($F(1, 95) = 0.70, p = 0.406$). A potential explanation is that the mood induction procedure was not effective in eliciting the target moods, therefore, this study could not fully investigate the potential for mood and stop rules to contribute to NJREs. Future studies should investigate the applicability of the MAI model to NJREs with alternative mood induction procedures (e.g., watching affectively charged films) and consider the contribution of additional, important factors (e.g., perfectionism and desire for control) in the development of NJREs.

Kylie Zaner, Statistics

Jeanne Hill, mentor

A Spatial Approach to Modeling United States Wildfires and Property Loss Implications

With climate undergoing unprecedented changes within the past several decades, wildfires have only become more frequent across the globe, with the United States being no exception. Sweeping wildfires have been the cause of total loss of entire neighborhoods, amassing billions of dollars lost in property every year. Despite recent advances in statistical methods and the field of actuarial science (the discipline of applying mathematical and statistical methods to assess risk in insurance), there is still a gap in accurately pricing wildfire policies in the insurance industry. This gap, in part, is due to the difficulty in predicting the frequency, severity, and location of catastrophic events. This thesis attempts to bridge the gap by applying the geostatistical technique, kriging, to wildfire data from the United States over the span of 25 years. With the wildfire size estimates produced from the kriging model, the potential construction of a predictive model of property loss that has a penalty based on the size estimates is explored. Building on this, a closer look at California is used as an example as to what data would be needed and how the data would be matched to the kriged values, providing a guideline for future applications.

Hannah Zimmerman, History & Political Science

Julie Anne Sweet, mentor

Reluctant Father of the Bill of Rights: The Evolution of James Madison's Stance on Amendments to the Constitution

The United States Bill of Rights serves as the foundation of freedom and liberty in American society today, and it has remained a highly respected standard throughout the nation's history. When examining its origin, James Madison was the strongest advocate who ensured these protections would be enshrined in the Constitution to safeguard the civil liberties of the American people. Initially, Madison was not in favor of adding these amendments to the Constitution, but with time, he became not only the Father of the Constitution but also the chief architect of the Bill of Rights. Regardless of the true motive for his mind change, without Madison's dedication to drafting and introducing the amendments to his fellow members of the House of Representatives, the Bill of Rights may have never made it past the First Session of Congress. This thesis will explore Madison's changing opinion on amendments, and it will also discuss the many challenges he faced to get these additions incorporated into the United States Constitution.