

# UMD

## UNIVERSITY HONORS

---

### UNIVERSITY OF MINNESOTA DULUTH

**Driven to Discover™**

Please join University Honors as our spring graduates present their senior capstone projects this Thursday, April 21, from 3:30 - 5 p.m. in Kirby Ballroom. University Honors is comprised of UMD students across all four colleges. University Honors members are required to take University Honors courses, engage in their communities, complete this honors capstone scholarship project, and maintain a high GPA to complete the program.

#### **Kennedy Antczak, Biology, SCSE**

##### **Capstone Advisor: Dr. Jessica Sieber, Assistant Professor, Department of Biology**

*Culture isolation and characterization of Thioploca sp. from Lake Superior sediment*

The *Thioploca* genus of bacteria is characterized by filamentous, gliding, sulfur-oxidizing bacteria. *Thioploca* appear to be ubiquitous across aquatic environments, and are found in marine, brackish, and freshwater bodies, including in Lake Superior. *Thioploca* species play a critical role in aquatic sulfur and nitrogen cycling by sequestering nitrate and elemental sulfur within their cells. *Thioploca* are shown to be phylogenetically related to other large sulfur bacteria *Beggiatoa* and *Thiomargarita* which utilize various sulfur compounds, nitrate, and simple carbon sources like propionate and acetate. Although they are well-characterized, *Thioploca* have not been successfully cultivated in a lab setting. Using information about related species and current literature, local *Thioploca* from Lake Superior were grown *in vitro* in order to study the conditions required for laboratory growth. With the preliminary data of this study, further study can be done to define the parameters and create a growth setup required for a sustained isolated or mixed culture of *Thioploca*, which has yet to be characterized.

*Plans after graduation: Attend the Biosciences program at UMD and will continue my research on Thioploca; and will (hopefully!) inspire a new generation of microbiologists as a Graduate TA.*

#### **Elizabeth Breitbach, Chemical Engineering**

##### **Capstone Advisors: Dr. Molly Harney, Associate Professor, Department of Education (Fall 2021); and Steve Graner, M.A., NME Project Director (Spring 2022)**

*Trauma informed approach to individualized academic support*

Trauma is perhaps one of the largest public health crisis facing children today. More than two thirds of children have experienced at least one traumatic event before reaching adulthood. Numerous studies have shown a direct relationship between the number of Adverse Childhood Experiences, ACEs, and increased negative outcome throughout the lifespan, such as chronic illness, depression, and substance abuse. Adverse and dysregulating environments in children's lives greatly affect their ability to succeed in school. A study by the CDC found students who reported 3 or more ACEs were 2.5 times more likely to fail a grade.

The purpose of the study was to hear directly from the mothers and children living at the Steve O'Neil Apartments, a supportive housing unit for families suffering from long-term homelessness, to understand the struggles and barriers children living in poverty face in an academic setting and how

community systems and programs may support low-income families as their children work to achieve academic success. Five families with school age children participated in the study. The data revealed 100% of the women surveyed reported 4 or more ACEs ( $M = 7.4, SD = 1.5$ ). Mothers reported fewer ACEs for their children ( $M = 3.0, SD = 3.4$ ). Learning and development interviews were conducted with both mothers and children. Several notable themes appeared in the interviews. Most children have an Individualized Learning Plan, struggle with focusing and paying attention, struggle to stay awake during school, work best in a quiet environment, wish to have more 1 on 1 support, and are hungry during the school day. Using the personalized information gained from the families, combined with collaboration with Steve Graner from Neurosequential Network, modules were created to educate and provide UMD students with the tools they need to successfully provide academic support to children living in poverty.

*Plans after graduation: A gap year before (hopefully) pursuing a career in medicine with a focus on trauma-informed care and developmental stress in the pediatric population.*

*Words of appreciation and gratitude: All the thanks in the world to Dr. Molly Harney and Dr. Aparna Katre for giving a voice to the women and children who have been silenced for far too long. To Steve Graner for so willingly sharing his wisdom, kindness, and soul. To my mom and dad, who have not ever doubted me, not even for a second.*

### **Rachal Cross, Social Work**

#### **Capstone Advisor: Dr. Katt Bongar Hoban, College of Education and Human Service Professions**

##### *An Analysis of Corporate Solidarity Statements for BLM on Twitter*

The goal of this research was to serve as an investigation into the commonly held suspicion surrounding large companies' involvement with social justice movements. Due to the widely known financial incentives to please customers, we decided to question if when companies post solidarity statements on social media, (specifically Twitter) there is any substance behind the words. Are they planning to practice what they post? We then decided what better contemporary issue to tangibly use than Black Lives Matter after its resurgence in popularity and notoriety during 2020-present.

To facilitate our project and answer our research question, we scrolled back through the Twitter feeds of the Fortune 500 Top 200 companies to analyze any and all posts that were relevant to the subject. Trends such as how many posts relevant to BLM or racism were made, if donations were promised, any proposed policy amendments, etc. were studied and logged. Currently, our research has so far noted the small percentage of the 200 corporations that made any statements of action (10%), the prevalence of consumer centered/involved businesses being more likely to post and make promises than other companies, and the fact that essentially zero corporations made any direct political affiliation statements. This gives more concrete insight into how social movements are involved with influential corporations and vice versa.

*Post-Graduation Plans:* Following a hopefully calm summer consisting of self-care, this fall I will be enrolled in the advanced standing Master's of Social Work (MSW) graduate program at UMD where I will continue pursuing my career goal of becoming a mental health therapist.

*Words of Appreciation* I would like to thoroughly thank everyone who has helped me get to this point in my life: my parents, my family, my friends, my teachers, my professors, and everyone in between. I would not be where I am today without their support and I am just so proud that I have made it this far and I look forward to what the future will bring.

## **Kailee Grahek, Biochemistry**

### **Capstone Advisor: Dr. Jacob Brown, Assistant Professor, College of Pharmacy**

#### *The Use of Pharmacogenomic Testing in Opioid Dosing*

The use of opioid medications in pain management is very controversial. Some patients can use these drugs with no complications. Others may develop substance use disorder or have adverse reactions that can be life threatening. Prescribing and dosing these medications is often based on trial and error. A patient may have to try various medications at various doses to find an effective treatment. These medication changes can lead to confusion for the patient and can cause them great discomfort if the right medication is not found quickly.

Pharmacogenomics is the study of how people respond differently to medications based upon their genome. Genetic tests can be used to look at specific genes and see which medications someone can metabolize well, and which ones could be harmful or ineffective. Pharmacogenomics is not yet widely used in clinical practice. However, there is currently research suggesting that using pharmacogenomics when dosing opioid medications can help minimize adverse effects.

This literature review will be analyzing current information on the use of pharmacogenomics in opioid dosing. To do this, existing dosing guidelines from multiple pharmacogenomic groups will be compared. Current testing protocols and case studies from patients who had genetic testing done when being prescribed or using an opioid medication will also be evaluated. This information can be used to determine if this testing should be implemented in clinical practice.

*Plans After Graduation: Attend the University of Minnesota College of Pharmacy on the Duluth campus.*

*Words of Appreciation: I'd like to thank my parents for constantly helping and supporting me throughout my life. I would also like to thank my boyfriend for all the support over the last five years. Without you all I would not be where I am today, and I really appreciate the continued support as I start pharmacy school. I'd also like to thank Dr. Brown for taking the time to help me throughout this research project.*

## **Meghan Hesterman, Unified Early Childhood Studies and Spanish Studies**

### **Capstone Advisor: Dr. Ariri Onchwari, Associative Professor, Early Childhood Education**

#### *Stories, Values and Children's Books: Portraits of Three White Preschool Teachers Committed to Anti-Racist Pedagogy*

The murder of George Floyd sparked conversations about racism on a global scale, forcing a critical examination of racial injustice within different systems, including education. This new focus resulted in renewed analysis and critique of current anti-racist practices in educational spaces, including early childhood settings. Early childhood anti-racist practices have been a topic of controversy by policymakers, school boards, and legislators. Early childhood is foundational in the development of children's identity and their appreciation of others. The earlier students are implicitly and explicitly introduced to and become comfortable talking about race and racism, the more prepared they are to dismantle systemic racism. Developmentally appropriate anti-racist pedagogy in preschool capitalizes on young children's developing societal awareness of race and racism. Carefully selected children's books are a powerful pedagogical tool for addressing anti-racism in the classroom. These books serve to reflect the identities and experiences of the students in the classroom as well as provide an authentic glimpse into the lives and cultures of other communities. This study describes three white preschool teachers' knowledge and application of anti-racist pedagogy with young children, including their children's books selection and sharing practices.

*Meghan's plans after graduation: Apply for a Fulbright Scholarship grant for an English Teaching Assistant position in a Spanish-speaking country starting in the fall of 2023. Other plans include pursuing an early childhood teaching position in the Duluth or Twin Cities area.*

**Atticus Hodges, English; Statistics and Actuarial Science**

**Capstone Advisor: Krista Sue-Lo Twu, Associate Professor, Medieval & Renaissance Literature, Head, Department of English, Linguistics & Writing Studies**

*King Arthur in Brexitland: "The Kid Who Would be King"*

Bleak futures, pessimism, and division plague Britain and the surroundings of the children in the film, *The Kid Who Would be King*. While not directly mentioned, Britain's vote to leave the European Union (Brexit) in 2016 is the direct cause of the desolate, leaderless nation that the kids live in. At the same time, the story of King Arthur has been retold numerous times to reflect the state of Britain at the time of its respective creators. Therefore, the modern state of Brexit, historical factors leading to Brexit, youth anxiety, Britonian idealism, elements of the film, and the use of King Arthur's story in British culture are all points of analysis, and how they influence *The Kid Who Would be King* is the main focus of the research done in this paper. The outlook of Britain and the kids who will have to deal with the effects of Brexit and other issues, as seen in the film is discussed as well. Having many concerns, from climate change to Brexit, whose effects will only be fully realized in the future, young kids will be the ones who have to directly deal with the consequences. How they will respond, and how we can give them hope, is an important topic to discuss.

*Words of Appreciation: To Dr. Twu, incredibly grateful for the guidance, critique, and mentorship you have provided me for my entire four year at UMD. Without your presence I would not have grown into the writer and student I am, and would be hopelessly lost in my post-graduation search. To my parents and sister, your love and support drove me to strive for becoming a better student, but also a better person. And then for everyone that has made UMD feel like home, you all made it an incredible four years.*

**Lila Lohmiller, Biology**

**Capstone Advisor: Dr. Amanda Grusz, Assistant Professor, Department of Biology**

*Raised Gardens: An Alternative Food Source*

Communities across the United States increasingly struggle with sourcing fruits and vegetables that are fresh, easily accessible, and low-cost. Lacking accessibility to these products may stem from numerous factors including but not limited to socioeconomic status (SES), geographical limitations, or inadequate transportation chains. An individual's ability to grow fresh produce allows them to pivot their reliance upon produce markets to their own backyards and patios for fresh fruits and vegetables.

When compared to traditional in-ground gardens, raised garden beds have become a gardening favorite in recent years among those who wish to start gardening, have limited space and resources, or are attracted to the raised bed aesthetic. For numerous reasons, raised garden beds have become more popular and the question is worth posing: are raised garden beds a viable alternative to traditional in-ground beds for those wanting to grow their own food?

This project compares raised garden beds to traditional in-ground garden beds to see if raised garden beds can produce the same quantity and quality of a traditional garden. Dependent variables of plant height, plant biomass, and soil moisture will be studied.

*Plans after Graduation: Apply to Medical School and continue working with the Olga Lakela Herbarium.*

*Words of Appreciation: A huge thanks to my parents and family for always encouraging me to be my best and supporting me in whatever I do; the amount of love and support has been overwhelming. To Dr. Amanda Grusz, thank you for being so passionate about the work that you do – it is contagious and I now love plants and research more than ever. You are engaging, you are thoughtful and kind, and you are the best; I have loved every second with you. To UH, thank you for being so kind to me over the last four years; the classes, friends, and experiences have been more than worth it.*

**Grace McLarnan, Communication Sciences and Disorders**

**Capstone Advisor, Dr. Molly Harney (August 2020-January 2022) Associate Professor, Unified Early Childhood Studies**

*First Ladies of the Hillside: Invisible No More*

When the Corona Virus broke out in the spring of 2020 many people recall the fear, and isolation that was felt around the world. One group particularly impacted by the pandemic were those living in the Central Hillside of Duluth in a supportive housing apartment building. When the lockdown first began, many women in the building found themselves homeschooling their children, without wifi, and scared. The feelings of isolation were intense, and the temptations of relapsing into old habits grew louder for many. Having worked with many of these very women, and their children for years, Dr. Molly Harney, an associate professor at the University of Minnesota Duluth stepped in to help. Around the same time she was meeting her honors students, she quickly merged the two in order to see what could come of a relationship between a group of women living in the Central Hillside and a group of honors students at UMD. This project explores what has come of that relationship and the trajectory of that very group moving forward.

*Plans after graduation: For the next year I and a close friend are moving to Europe through a program called WWOOF, which will allow us to live and work on sustainable farms in Ireland, Spain and beyond. Following that year I plan to pursue a Masters in Speech Language Pathology.*

**Words of appreciation:** *Of course I would like to thank my family, who have kept me grounded throughout my college experience and always pushed me to do my very best. My boss at the UMD greenhouse, Matt Jahnke, who has been a huge support during all four years of college, who watched me grow and always accepted me for who I am. And finally my deepest gratitude to Dr. Molly Harney, it is hard to say where I would be had I not taken her class in the fall of 2020. But I can be sure that she changed the course of my college experience completely and for the better. The lessons I have learned because of her are invaluable. I have no words to express how deeply I have appreciated her presence in my life over the past two years.*

**Sydney Meister, Healthcare Management**

**Capstone Advisor, Gregory Petry, Instructor, College of Health and Human Services Professions**

*Green Exercise: Attitudes and Understanding Of An Undergraduate Population*

The benefits of working out have been instilled in us at a very young age. However, it is not always told or reminded how important working out in an outdoor environment is. Although there are large amounts of data that correspond with the benefits of working out outdoors, there is a significant lack of information when it comes to perceptions or understanding around the topic of "green exercise."

*Plans after graduating: Job hunting!*

*Words of appreciation: Huge thank you to UH for pushing me academically and keeping me in check; and an even bigger thank you to my parents, best friends, and boyfriend for reminding me of my potential and inspiring me to continue to reach for the stars... Now and always!*

**Rachel J. L. Miller, Psychology,**

**Capstone Advisor, Dr. Ashley E. Thompson, Associate Professor, Department of Psychology**

*Rose Colored Glasses: An Exploration of the Causal Relationship between Sexual Nostalgia and Sexual Satisfaction*

Sexual satisfaction offers a variety of mental/physical health benefits to one's life. Despite extensive literature, only one study has investigated how sexual nostalgia impacts sexual satisfaction (Bjorback et al., 2021). Thus, the current study adopted an experimental design to examine the causal relationship between sexual nostalgia and satisfaction. 140 participants were randomly assigned to a sexual nostalgia, general nostalgia, or control condition and completed a battery of questionnaires. Results revealed that there was not a significant effect of nostalgia condition on self-reported sexual satisfaction ( $F[2,137] = 1.45, p = 0.24$ ), likely because of the short duration of the research design. In the future, researchers should examine the impact of sexual nostalgia using a longitudinal format by assessing satisfaction weeks or months later. Nevertheless, these findings have implications for clinicians working with couples experiencing low sexual desire and/or unmet sexual needs.

*Plans after graduation: I will pursue a Master of Nursing degree at the University of Minnesota. Then, I plan to pursue a Doctor of Nursing Practice degree with an emphasis in Pediatric Primary Care at the same institution. Additionally, I will become a Certified Developmental Disabilities Nurse.*

*Words of appreciation and gratitude: Thank you mom, dad, and siblings for the impact you have had on every aspect of my life and character. You have given me an abundance of love, respect, forgiveness, patience, life lessons, and endless opportunities. Thank you, Dr. Thompson, for being my advisor, mentor, and professor. Thank you for taking a chance on me, seeing my potential, pushing me to a higher research, academic, and personal level, and playing a key role in my admission to graduate school. Additionally, I would like to thank my friends and boyfriend, Bailey, for their consistent love, support, patience, motivation, and encouragement! Furthermore, I would like to thank the UMN systems and UWS's McNair Program for funding my research and giving me lifelong opportunities and community.*

**Megan Nelson, Communication Sciences and Disorders**

**Capstone Advisor, Dr. Brent Fisher, Assistant Professor, Communication Sciences & Disorders**

*Sound Levels and Noise Intervention in an Early Childhood Setting*

Noise exposure has extremely negative effects on children, and this issue demands attention as children's full potentials across the globe are being hindered by excess noise. I chose the topic of my project because I aspire to be a speech language pathologist in an elementary school setting, so I am passionate about the wellbeing of children in classroom environments. The purpose of this sound study was to determine whether the sound levels at an early childhood daycare facility exceeded the recommended exposure levels according to the National Institute for Occupational Safety and Health. After determining the baseline sound levels at the facility, a visual aid device was implemented with the intention to decrease the noise level in the classroom.

*Plans after graduation: I plan to attend St. Cloud State's graduate program for Communication Sciences and Disorders to become a speech language pathologist.*

*Words of appreciation and gratitude: I am filled with gratitude as I reflect on my undergraduate experience. My mom and dad have offered me ceaseless encouragement and selfless support throughout my time at UMD, and for this I am incredibly thankful. I am also grateful for the UH community, as it has provided me with several amazing opportunities and life-long friendships. Lastly, I appreciate and admire my instructors and mentors at UMD for the time and energy that they poured into providing me with an excellent education.*

**Brynne Pass, Psychology and Women, Gender, Sexuality Studies**

**Capstone Advisor, Dr. Mitra Emad, Professor, Cultural Anthropology**

*Individual Mask Wearing During COVID-19 Pandemic: An Intersectional Decision*

This analysis dives into editorials, commentaries, and letters to the editor from newspapers published during the pandemic on mask wearing policies and what is involved in individual and community decision-making about policy implementations. The intent of this content analysis is to demonstrate that mask wearing isn't an easy decision, and it is much less polarized than politics makes it appear. I specifically analyzed the language used in the content to identify patterns of intersectionality in the discussion about mask wearing and how language of dominance can hinder the ability to make intersectional decisions on policies regarding public health.

*Words of appreciation and gratitude: There are not words to describe how thankful I am to my family and all of my professors that have guided me as I have grown in my education and as a human. Specifically I would like to thank Dr. Devaleena Das and Dr. Mitra Emad for reminding me to be passionate about what I study and what I do throughout my life.*

**Rayann Rehwinkel, Geology BS, Chemistry BA**

**Capstone Advisor, Dr. Christina Gallup, Associate Professor, Department of Geological Sciences**

*Dating Fossil Corals using  $^{230}\text{Th}$  to Constrain the Tectonic History for Araki, Vanuatu in the Western Tropical Pacific*

Radiometric dating of fossilized corals using the uranium-thorium decay chain allows scientists to track ancient sea levels and tectonic uplift of land by correlating fossil ages and elevations. My capstone project focuses on refining a model for tectonic uplift for Araki, a small island in the nation of Vanuatu, created by Claire Rabine in 2019. In Rabine's model, older alpha spectrometry ages were averaged to constrain an age for the top of Araki. Alpha spectrometry has a much larger uncertainty than modern mass spectrometry, so my capstone will focus on using mass spectrometry to date new fossil coral samples from Araki collected by Dr. Gallup in the Fall of 2019. I will also use Powder X-Ray Diffraction (XRD) analysis to determine how "clean" the samples are. Fossil corals are made primarily of aragonite, which incorporates uranium into its crystal structure. With contamination from meteoric water, aragonite may shift phases to become calcite, which may result in the loss of uranium, and this introduces inaccuracies into radiometric dating. Thus, by using precise mass spectrometry to date the fossil corals along with Powder XRD to ensure low levels of calcite, this project will be able to constrain a more accurate age for Araki's peak. Once an age is determined, known sea level data from other studies can be used to determine uplift rates for the island. Araki's location is unique in that it sits above a subduction zone, so seismic events are not uncommon. Research like this, which determines tectonic behavior and rates of movement, is important because it can be used to better understand how and when seismic events are generated. As humans, this understanding is critical for risk management and keeping people safe, and the more data there is the better scientists are able to protect the public.

**Meredith Reynolds, Biology**

**Capstone Advisor, Dr. Jessica Sieber, Assistant Professor, Department of Biology**

*Exploring the Impact of Bile Acids on Microbes During Hibernation*

In this study, the effect of bile acid concentration on the gut microbiome of squirrel ceca was studied. During the periods of hibernation in which an animal is fasting and has decreased metabolic activity, bile acid concentration changes significantly. Gut microbiome composition can change due to various factors, and changes in bile acid concentration may be one of those influencing factors. Overall, the results of the fall samples were consistent and the results for the torpor samples were inconsistent. All three of the fall samples showed a significant antiproportional relationship between microbial growth and bile acid

concentration. However, for the torpor samples, one showed an antiproportional relationship similar to the fall results and two showed a proportional relationship between microbial growth and bile acid concentration. From these results, we can conclude that bile acid concentration does affect the gut microbiome growth during the pre-torpor fall season. However, no definite conclusion can be made regarding how bile acid concentration affects the gut microbiome during periods of torpor.

*Plans after graduation: Apply to Medical School*



**Michaela Sanger, Bachelor of Science in Biochemistry, Minor in Psychology**

**Capstone Advisor, Dr. John Dahl, Associate Professor, Department of Biology**

*Concentration-Dependent Kanamycin Persistence: Designing a Model Assay Using Mycobacterium smegmatis*

Mycobacterium smegmatis is a common model used to understand mycobacteria, particularly Mycobacterium tuberculosis (M. tb). The mechanism of M. tb latency is still unknown, but by using non-pathogenic mycobacteria this mechanism can be studied. M. smegmatis has shown persistence, but no current studies report concentration-dependent persistence to the antibiotic kanamycin.

The aim of this study was to build upon a previously developed novel kill assay and use it to determine if M. smegmatis exhibited resistance, tolerance, or persistence to kanamycin at varying concentrations.

Methods: M. smegmatis liquid cultures grown to exponential phase O.D.600 0.5 were exposed to the bactericidal antibiotic kanamycin, which inhibits protein synthesis. Kanamycin concentrations of 25 µg/ml, 12.5 µg/ml, 6.25 µg/ml, and 3.13 µg/ml were tested over four experiments to determine data reproducibility. Plating at specific timepoints and counting surviving colonies (CFUs/ml) determined the rate of the “kanamycin kill.”

Results: At kanamycin concentrations 12.5 µg/ml, 6.25 µg/ml, and 3.13 µg/ml, M. smegmatis exhibited a persistent state. This follows a biphasic kill curve where most of a bacterial population was initially killed by the antibiotic, but a subpopulation persisted at high concentrations of the antibiotic. However, at 25 µg/ml, M. smegmatis exhibited a fully drug-susceptible state in which all bacteria were killed.

Conclusions: Mycobacterium smegmatis can be used as a model to study concentration-dependent kanamycin persistence.

*Plans after graduation: Submit applications for Medical School while working for Mayo Clinic Hospital*

**Mikayla Sundlie, Communication Sciences and Disorders**

**Capstone Advisor: Dana Collins, Ph.D., CCC-SLP, Associate Professor and Director of Graduate Studies in the Department of Communication Sciences and Disorders.**

*Speech Language Pathologists' Rationale for Therapeutic Decisions: Expiratory Muscle Strength Training Versus Lee Silverman Voice Treatment in Clients with Parkinson's Disease*

This study seeks to understand how speech-language pathologists make clinical decisions when choosing between expiratory muscle strength training and Lee Silverman Voice Treatment in clients with hypokinetic dysarthria associated with Parkinson's disease. A survey was sent out to the MNSHA listserv as well as to personal contacts exploring clinician background, experience and use of both forms of treatment, training, and demographic information.

*Plans after graduation: Gap year then graduate school for audiology*

**Abby Swanson, Theatre, Spanish Studies, and Psychology**

**Capstone Advisor: Ryan Hjelle, Instructor, Department of Psychology**

*Differences in COVID-19 Guideline Adherence Among Sports Enthusiasts*

This study seeks to understand how personality factors can affect how a person chooses which sports to follow, such as a team sport (baseball) or individual sport (golf), and how the type of sport and personality influenced how well they followed COVID-19 guidelines during the pandemic. An online survey was given to undergraduate psychology students at UMD.

**Abbey Sweetman, Economics and German Studies**

**Capstone Advisor: Dr. Geoffrey Bell, Associate Professor; Faculty of Strategy**

*Looking at resilience with a new eye: A nomological network and model*

Some organizations demonstrate a resilient nature by surviving internal and/or external jolts to their system. While other organizations fail to demonstrate resilience and cannot withstand these shocks to

their system. The resilient nature of an organization is internally created and comes from an organization's culture that fosters resilience. Examining the antecedents and related constructs that generate a culture of resilience helps to better understand organizational resilience in order to answer the question "what characteristics promote organizational resilience, and what characteristics lead to organizational fragility?" Through the process of a configurational model, the resilience - fragility continuum is developed in order for organizations to learn how to maximize their resilience.

*Words of appreciation and gratitude: Big thanks to all the mentors I have had up to this point, with special thanks to Geoff Bell and all of his support throughout the capstone project. Thank you to my parents for their endless support and encouragement. Lastly, thank you to the Kirby Student Center for being the place for me to continue to grow and develop during my three years of student employment at the Welcome Desk.*

*Plans after graduation: Joining the global consulting firm Protiviti working as a Risk and Compliance Consultant*