Final Writing Modules

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Key Terms

Toxic Stress

According to Harvard's Center on the Developing Child, toxic stress occurs "when a child experiences strong, frequent, and/or prolonged adversity—such as physical or emotional abuse, chronic neglect, caregiver substance abuse or mental illness, exposure to violence, and/or the accumulated burdens of family economic hardship—without adequate adult support. This kind of prolonged activation of the stress response systems can disrupt the development of brain architecture and other organ systems, and increase the risk for stress-related disease and cognitive impairment, well into the adult years." [1]

Defense Mechanism

According to dictionary.com, a defense mechanism is "an unconscious process, as denial, that protects an individual from unacceptable or painful ideas or impulses." [2]

Trauma Informed Care

According to the Runaway and Homeless Youth Training and Technical Assistance Centers, trauma informed care is " a strengths-based framework that is grounded in an understanding of and responsiveness to the impact of trauma, that emphasizes physical, psychological, and

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[1] Center on the Developing Child, "Toxic Stress."

[2] "Definition of Defense Mechanism."

emotional safety for both providers and survivors, and that creates opportunities for survivors to rebuild a sense of control and empowerment." [3]

Narrative Competence

According to Rita Charon, director of the Narrative Medicine Program at Columbia University, narrative competence is "defined as the set of skills required to recognize, absorb, interpret, and be moved by the stories one hears or reads. This competence requires a combination of textual skills (identifying a story's structure, adopting its multiple perspectives, recognizing metaphors and allusions), creative skills (imagining many interpretations, building curiosity, inventing multiple endings), and affective skills (tolerating uncertainty as a story unfolds, entering the story's mood)." [4]

Abstract

My thesis research focuses on how the use of narrative competence in medical education can be a potential prevention strategy for misdiagnosis later in a medical professional's career, using toxic stress as a content area for application. I plan to explore a framework for medical professionals in training which emphasizes the importance of a patient's narrative in order to serve as a reminder to look beyond literature like the DSM-5 when trying to understand a patient's issues.

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[3] Cassidy, "Harm Reduction, Positive Youth Development, and Trauma Informed Care: What Are They and How Do They Operationalize in Youth Serving Programs."

[4] Charon, "Narrative and Medicine."

Concept and Form

"Narrative Competence in Medical Education" is a framework which aims to continuously prime medical students before clinical rotation to understand the value of a patient's narrative. This framework employs three historically separate areas of research to address the gap in understanding: media based narrative, toxic stress literature, and medical education curriculum development. For the scope of my thesis, I am currently prototyping one intervention to be placed in the beginning of a psychology and neuroscience rotation at New York University Langone School of Medicine.

The intervention is a brief in-class activity in which two students each watch a different perspective of the same case study from chapter 5 of Dr. Bruce Perry's book The Boy Who Was Raised as a Dog. The case study is about a neglected child who grows up to become a criminal. One perspective covers the mother's account of the boy's childhood and the other perspective covers the boy's perspective in prison. Students will be asked to report back to each other using the history of present illness framework and reflect on their assumptions about the video they each watched. The instructor will reveal that the videos are about the same patient and then start a group discussion about understanding narrative in context and how it will impact the students' own practice as future medical professionals.

Impetus

My thesis research is driven by my interest to understand and intervene in broken systems that fail many children. My brother and I are products of systems that didn't protect us from the

trauma we experienced. I grew up and left the our toxic environment, but he did not. I quickly learned how differently people handle trauma and saw him swiftly decline into a life of drugs and criminal behavior. After seeing how the effects of the trauma completely derailed his life, I became very interested in working with projects that tried to understand how different systems fail children. I wanted to understand why these systems failed children so that I could create interventions in to mitigate their effects.

Instead of working directly with children suffering from toxic stress, I wanted to look at how traumatized children slip under the radar of professionals who can help them. By looking at how we can improve understanding and identifying traumatized children, we may be able to provide a larger number of children better resources in a more manner.

Directly, my thesis research matters to medical professionals because it aims to get them better training so that they will be able to foster a more reflective diagnosis practice. Indirectly, my thesis matters to children suffering from toxic stress because if doctors are better trained, the hope is that the children will get better and more appropriate care. The current application of my thesis is aimed at the medical field but in the long term, it may be a teaching model for counselors, teachers, and other professionals working with youth on a regular basis.

My personal contribution is small due to the limited scope of an M.F.A. thesis, but my hope is by the end of the year, I have at least a better understanding and awareness of how medical professional training is crucial to keeping children safe. If my thesis prototypes fail, then people working with similar questions know what not to do and the community of people interested in this effort will keep trying other interventions until something works.

Impetus-based goals and design questions

My first goal during this thesis year was to understand different manifestations of childhood trauma. Having a better foundation of understanding about toxic stress was important for me so that I could understand more than just my own experience. After that, I wanted to understand how traumatized children slipped through the cracks and didn't get the help they needed. Lastly, I wanted to explore systemic interventions that would get more traumatized children better treatment. Luckily, I learned about narrative competence and also explored that as an area of research.

From these, I created a few design questions which guided my research and prototyping process:

1- What are the behavioral manifestations of toxic stress?

2- What are the ways in which doctors are trained to deal with complex issues like toxic stress?

3- How can narrative competence increase a doctor's ability to better diagnose their patients?

Impetus results and conclusions

My current thesis strategy answers the first two of my design questions by exposing the possibility of what can happen to a traumatized child and provide another method of education for medical professionals. By continuing to prototype and test with medical students, I hope to answer the third design question. I can only answer that question through continuous experimentation and prototyping directly with my community of practice. It is highly likely that this third question will remain unanswered for the scope of this thesis year.

My thesis concept started with my interest in toxic stress and then expanded to look at better treatment practices as a whole. My resulting goal is to use my thesis to explore alternate methods of medical education practices and understand where narrative competence can improve medical training.

Critical Issues

In a very brief nutshell, the critical issue of my thesis project is the fact that gaps in medical education exist for treating complex issues like toxic stress. Children suffering from side effects of toxic stress or trauma are often misdiagnosed as suffering from ADHD, according to Dr. Nicole Brown of Johns Hopkins University. According to an Atlantic article summarizing Brown's work, "inattentive, hyperactive, and impulsive behavior may mirror the effects of adversity, and many doctors don't know how- or have the time- to tell the difference." [5] While both disorders have very similar behavioral manifestations, the treatment for them could be entirely different.

If both issues have the nearly the same symptoms and there's a gap in the provider's medical education and lack of experience with complicated issues like toxic stress, there's the possibility that the diagnosis will not consider all possibilities. A child truly suffering attention deficit disorder might benefit from treatment using a prescription. While on the other hand, the child suffering from toxic stress might require a totally different treatment, such as therapy or an intervention with child protective services.

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[5] Ruiz, "How Childhood Trauma Could Be Mistaken for ADHD."

The potential response that I'm exploring through my thesis prototypes is to employ narrative education techniques, which focus less on a list of diagnosable symptoms and more on understanding the context and narrative of a patient. According to Rita Charon, the director of the Narrative Medicine program at Columbia University, if the medical professional knows how to read into contextual clues and understand a patient's narrative, they'll be more equipped to diagnose and treat a patient better.[6]

From several interviews, I found that these gaps in medical education occur from a combination of a lack of resources, time, and heavy reliance on memorization methods. I first spoke with Dr. Blake Phillips from Bellevue Hospital's Partial Hospitalization Program and he highlighted that using traumatized patients as a teaching tool carries ethical risks, so other resources like medical actors may be used to learn about complex syndromes like toxic stress.[7] I then reached out to Sam Wilkes, an instructor of clinical medical education at University of Southern California, who noted that medical actors are rarely used for acting out situations with toxic stress due to the difficulty of acting and nature of the short term interaction.[8] Afterwards, I followed up with second year medical student Doug Zoerner who is also an esteemed curriculum committee member at the University of Kentucky School of Medicine. I learned that many people turn to memorization during a psych unit in medical school, which is where they might encounter discussions of toxic stress.[9]

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[6] "Models, Practices, Opportunities, and Challenges for Mutual Integration of the Arts, Humanities, and Medicine."

[7] Phillips, Interview with Dr. Blake Phillips.

[8] Wilkes, Interview with Sam Wilkes.

[9] Ali-Khan, Interview with Safi Ali-Khan.
Zoerner, Interview with Doug Zoerner.

Core Issues

While researching and trying to prototype and keep all constraints and variables in mind, I quickly came to understand how convoluted, varied, and sometimes impenetrable the medical education system is. My initial assumption was that medical education was fairly standardized, so I could expect the same protocols across the board for training, education, and resources implemented.

After continuously contacting my community of practice, which is a combination of students, doctors, and educators in different programs and hospitals, I realized that everyone gave me slightly varied information. For example, Doug Zoerner's psych rotation at the University of Kentucky will be based on lectures and memorizing the DSM-5 while Safi Ali-Khan's experience at New York University will be combined with a neuroscience unit and be partially spent in a clinical setting.[10] What makes this a core issue in the prototyping process is that my designed solution will have to bridge multiple educational experiences and I will need to user test in more than one institutional setting. This means that I'll need to continue to develop a robust community of practice who can give me feedback from multiple perspectives.

On the same note, another core issue to be addressed is the several areas of entry that my prototype could focus on. My prototypes could be targeted towards general medical education, but they could also be used in residencies or fellowships further down the line in one's education. If my approach was to target earlier in the chain of medical education, I could shift my prototypes to fit in the pre-medicine undergraduate track.

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[10] Ali-Khan, Interview with Safi Ali-Khan.
Zoerner, Interview with Doug Zoerner.

The driving question behind the decision of entry is at what point should an educator engage students in a discussion about context and narrative? If it is later down the chain of education, is this discussion important for all medical professionals to engage in? I would argue that narrative competence has more than just one application in clinical settings, but for the sake of my thesis, I'm just going to focus on toxic stress.

The remaining core issue I will need to address through prototyping is the success of each iteration. After interacting with my designed intervention, are students or professionals more likely to think about context and narrative? Did it impact the way they treat their patients? If this is a resource, I need to be able to validate and prove with data or some sort of testimonial that my resource works and is a viable option. This feedback will not only help me validate my final iteration, but it will help influence iterations during development.

Research: Domains + Precedents

The overarching domain for my thesis is trauma informed care. Trauma informed care, according to Runaway and Homeless Youth Training and Technical Assistance Centers (RHYTTAC), conceptually focuses on creating a safe environment for both survivors of trauma and medical providers by being aware and responsive to the impacts of trauma.[11] The central concept of this domain is crucial to my experimentation because it defines how I want to approach toxic stress as a subject matter to study. Taking the approach focused on understanding,

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[11] Ibid.

awareness, and safety will greatly impact the types of projects that I make because it specifies three pieces of criteria that my thesis will need to meet.
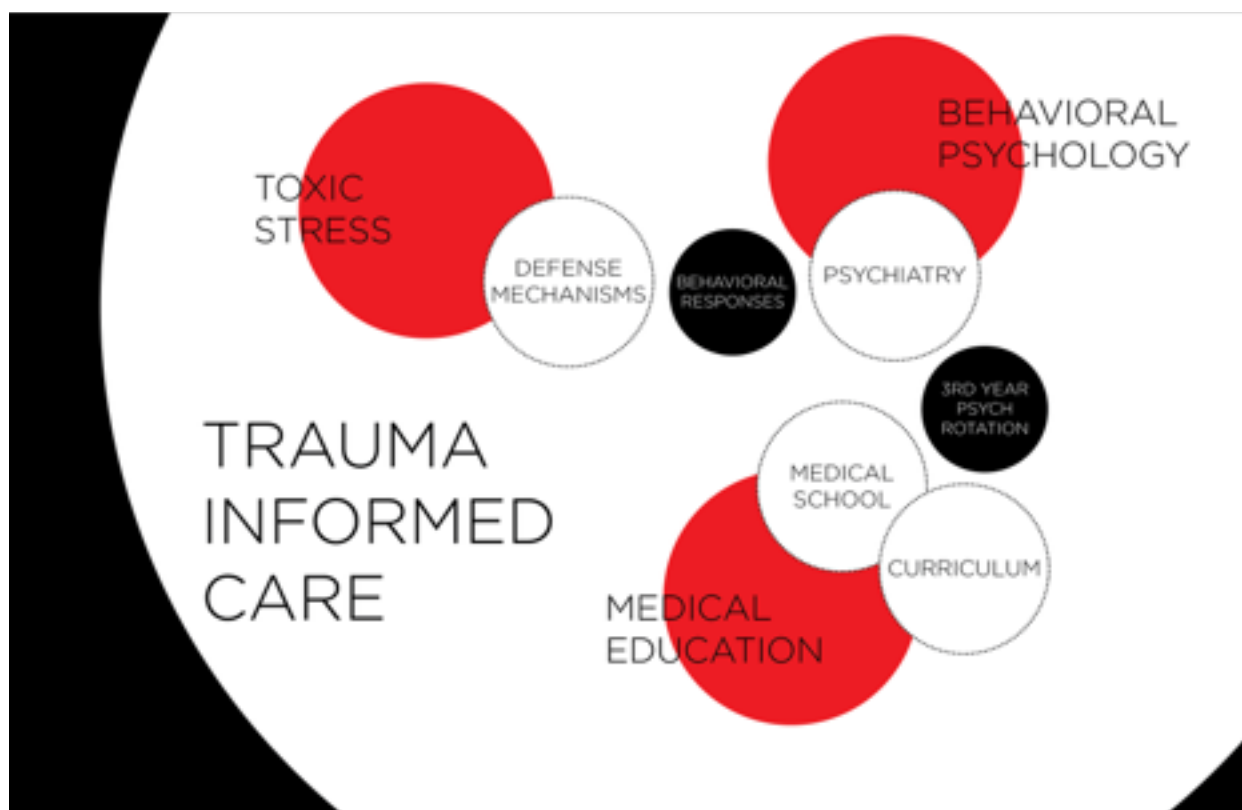
Through a trauma informed care approach, my thesis lands in the intersection of toxic stress, behavioral psychology, and medical education. According to the Center on the Developing Child at Harvard University, toxic stress is a response that occurs during a period of "prolonged adversity" without proper support. [12] A key concept in toxic stress focuses on the level of responses to trauma. More specifically, toxic stress is when the level of response can be potentially harmful to the survivor.[13] Additionally, understanding different psychological responses from toxic stress is crucial and ties into the domain of behavioral psychology, in which

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[12] Center on the Developing Child, "Toxic Stress."

[13] Ibid.

different responses, or defense mechanisms, are identified and defined. Understanding toxic stress

and its resulting responses is crucial to my experimentation because it lays foundational

knowledge and will help my ideas come from a research angle instead of a speculative and

assuming one.

The domain research that guided my thesis ideas started with reading books and articles about

trauma. Initially, I read *The Body Keeps the Score: Brain, Mind, and Body in the Healing of Trauma* by

Bessel van der Kolk to better understand how the brain is impacted during a period of trauma.

Van der Kolk discusses in depth how different parts of the brain, like how speech centers are

impacted during a traumatic event. In many cases, the speech centers shut down and essentially

render the victim incapable of being able to articulate their trauma, even well after the event has

passed.[14] Van der Kolk's writing gave me a better idea of the scope of trauma and helped me

narrow down my thesis focus into defense mechanisms and consequences of trauma.

Looking at the defense mechanisms and behavioral side effects that Van der Kolk discusses, such

as being addicted to danger, heavily influenced my initial ideas about what types of behaviors I

wanted my prototypes to focus on.[15] My first sketches focused on creating a series of robots that

displayed all of the different behaviors that can result from trauma. Van der Kolk also thoroughly

discussed the Adverse Childhood Experiences Survey (ACES), which was a very large study

conducted about the effects of childhood trauma. The ACES study also concludes with a list of

potential side effects and risk factors of trauma, such as constant anxiety and depression.[16] The

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[14] van der Kolk, The Body Keeps the Score: Memory and the Evolving Psychobiology of Posttraumatic Stress, 43.

[15] ibid, 100.

[16] Centers for Disease Control and Prevention, "Adverse Childhood Experiences (ACES)."
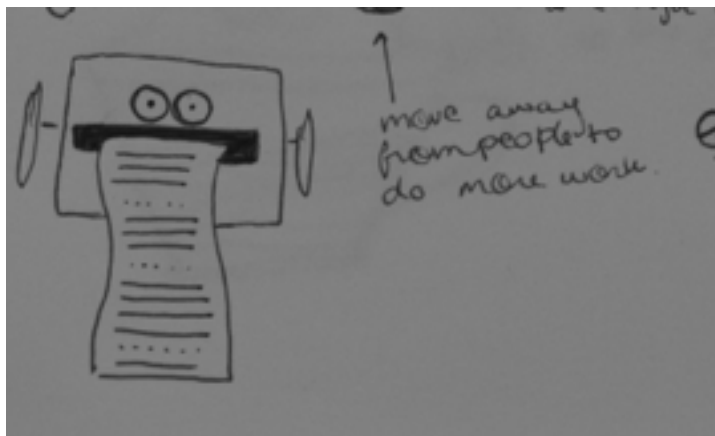
ACES study also influenced my initial sketches (see left).

In the very beginning of this process, I researched precedents and projects that address childhood trauma to see how other artists and companies are exploring this theme. *Beasts of the Southern Wild* is a fantastic film about a young child growing up in the swamps of southern United States in a fictional town. The child, Hushpuppy, has to endure extreme living circumstances, such as growing up as the only child of a single and dying, alcoholic father in an isolated village plagued with addiction and poverty. Hushpuppy survives by continuing to imagine a fictional, ruthless beast whose resiliency and strength makes him a feared, but revered animal.[17] Understanding trauma in this project was reliant on the use of storytelling, which may be an approach to explore in my thesis. Companies like Sesame Street also address trauma and resilience through several projects and apps that act as educational resources for parents and children.[18] My thesis takes direction from Sesame Street's approach, but depending on the form and ultimate expression, may rely heavily on storytelling.

During this time, I also read *The Boy Who Was Raised as a Dog* by Bruce D. Perry which covers several specific cases of how trauma impacted a child's behavior. Perry discusses unexpected cases of neglect and abuse, such as abandonment and sever lack of touch, while exploring how the

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[17] Richardson, Beasts of the Southern Wild.

[18] "Sesame Street."

child's brain was impacted, thus influencing their future behavior.[19] Perry's approach was more colloquially qualitative than quantitative, but his in depth analysis of each individual's case helped me better understand context as well as the many narratives of traumatized children.[20]

I quickly realized that I needed to reach out to medical professionals and researchers in the field to better understand the nuances of childhood trauma and toxic stress. I expanded my research strategy to interviews and conversations with professionals working in the domains of child psychiatry and trauma to get a better feel for whether or not my understanding was in line with their training. I first spoke with Dr. Blake Phillips at the Bellevue Hospital Center Child and Adolescent Partial Hospitalization Program and showed him my initial robot prototype sketches based on a few behaviors from Van der Kolk's book. Phillips first helped me better articulate my approach in studying behavior by noting that I was exploring different behavioral manifestations of defense mechanisms.

Phillips also noted that my thesis exploration could potentially be a tool for medical students in training.[21] He explained that it is difficult for medical students in training to access situations with traumatized children, due to a myriad of reasons. Because of this, students may not get proper exposure during the learning process and may be missing crucial training in their education.[22] Speaking with Phillips not only helped explain Brown's misdiagnosis claims mentioned earlier,

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[19] Perry and Szalavitz, The Boy Who Was Raised as a Dog: And Other Stories from a Child Psychiatrist's Notebook: What Traumatized Children Can Teach Us about Loss, Love, and Healing.

[20] Ibid.

[21] Phillips, Interview with Dr. Blake Phillips.

[22] Ibid.

but also shifted my research approach to focus on understanding defense mechanisms and responses on a deeper and more articulate level.

My pivoted research led me to George Valliant, a key thinker in the intersection of toxic stress and behavioral psychology who created a hierarchy for defense mechanisms caused by trauma or PTSD. His model categorizes defense mechanisms into four categories ranging from unhealthy to healthy defense mechanisms.[23] Valliant's hierarchy is important for my thesis because it helped me understand the breakdown of defense mechanisms in order to better connect other scholars' research on maladaptive and adaptive behavioral responses. While van der Kolk and Perry very much discuss behavior, Vallaint's model pinpoints what defense mechanism that behavior is coming from.

From there, I started to explore behavioral psychology and toxic stress through the lens of trauma informed care and medical education. I reached out to Sam Wilkes, an instructor of clinical medical education at the University of Southern California, for more information about training resources during someone's medical education when real patients cannot be used, such as a traumatized child. Wilkes was instrumental in explaining that resources like medical actors aren't necessarily used for in-depth training in areas like toxic stress and trauma, but rather for bedside manner and standard activities. Wilkes also mentioned different VR trainings and test dummies that are being used as extra resources, but they aren't being used specifically for working with children who suffer from toxic stress or trauma.[24] SimMan 3G is a test dummy that has different

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23 Vaillant, "Involuntary Coping Mechanisms: A Psychodynamic Perspective."

24 Wilkes, Interview with Sam Wilkes.

monitors inside of it. The dummy reacts to different medications and is more interactive, but according to Wilkes, SimMan has a long way to go before it can be used in standard training.[25] Additionally, the Bravemind VR project at the University of Southern California aims to tackle PTSD, but positions itself as exposure therapy rather than a training tool for medical professionals.[26] My thesis has shares the domain of trauma care, but focuses on medical training instead.

Wilkes was also instrumental in highlighting important features that medical students need in educational resources: longevity of interaction, physical and vocal indication, and outcome with feedback. The length of interaction is important for students to understand what it's like to see a client more than once and take time in their diagnosis, physical and vocal indication is important because it helps students understand how symptoms can be expressed, and outcome with feedback is important for the students to see where they went wrong and what can happen when they are wrong.[27] Wilkes supported Dr. Phillips' initial ideas about a need for more resources and
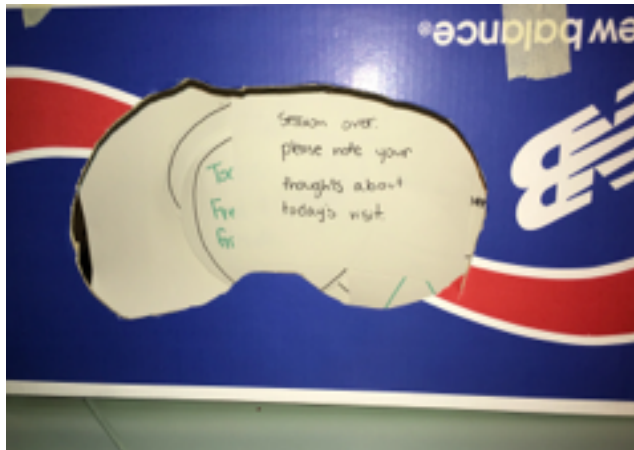
gave me an idea of the goals I should keep in mind when designing for medical students.

Wilkes' input influenced my second paper prototype (see left), which is a virtual reality headset in which a medical student, interacts

[25] Ibid.
   "SimMan 3G."

[26] Rizzo and Hartholt, "Bravemind: Virtual Reality Exposure Therapy."

[27] Wilkes, Interview with Sam Wilkes.

with a fictional traumatized patient over the course of a few sessions. The user would be able to ask the patient anything and start to piece together a diagnosis for what they think the child is suffering. After diagnosing the patient, the user would see their results as well as the outcome for the patient.

After speaking with Wilkes and testing my paper prototype on some classmates, I reached out to Doug Zoerner, a second year medical student at the University of Kentucky who is a representative of the curriculum committee, a very prestigious honor that 1 student per class gets nominated for. Zoerner gave me more insight about what a medical student goes through and when during their training they would be exposed to any conversation about toxic stress and trauma. Zoerner noted that while it is difficult to change curriculum, the psych rotation is usually the least time intensive rotation and thus, has more room for additional resources.[28]

According to Zoerner, during their psych rotation students often default to memorizing large chunks of the DSM 5, a "comprehensive" manual on all diagnosable psychological disorders. The DSM 5 is the fifth edition and the manual is constantly under revision.[29] While revision is an important concept for any piece of work, the DSM 5 no longer includes Valliant's model previously featured in the DSM 4.[30] There is the possibility that students may not even come into contact with this work. If that is the case, many medical professionals could be underprepared to interact or diagnose any child in a traumatic environment suffering from toxic stress. While this is

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[28] Zoerner, Interview with Doug Zoerner.

[29] American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders Fifth Edition.

[30] American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders Fourth Edition.

not proven yet on my end, this is a direction I will be exploring further for thesis. I have also been in contact with Dr. Wendy D'Andrea of the New School, Michael Schober of the New School, and Dr. Ruth Gerson of Bellevue Hospital for more information on my preliminary ideas, but am still waiting on feedback or have yet to meet with them in-depth about the current status of my thesis.

After speaking with Zoerner, I created another paper prototype (see left) of a world very similar to the first version, except for the fact that the emphasis was not on asking questions but rather finding clues within a child's answer to a question. Instead of asking the patient whatever, users will be guided through an interactive narrative in which they choose the appropriate question to ask. As the patient and the user interact more, the patient's world starts to fill up with more contextual clues about their past, thus providing a visual representation of what the user knows so far. The user will still diagnose the patient at the end, but the focus is shifted to understanding contextual clues and paying attention to more than checking off a list of behavioral symptoms. This new prototype focuses more on the theme of understanding how misdiagnosis happens instead of acutely representing various behavioral manifestations of toxic stress.

In mid-October, I attended The National Academics of Science, Engineering, and Medicine Information Gathering Workshop about education and technology within the sciences. I was exposed to a new trend in medicine that focuses on narrative as a tool for bettering medical education. Dr. Rita Charon of Columbia University spoke about the Narrative Medicine program she runs and opened my eyes to the fact that a good medical education is not always about memorizing facts.
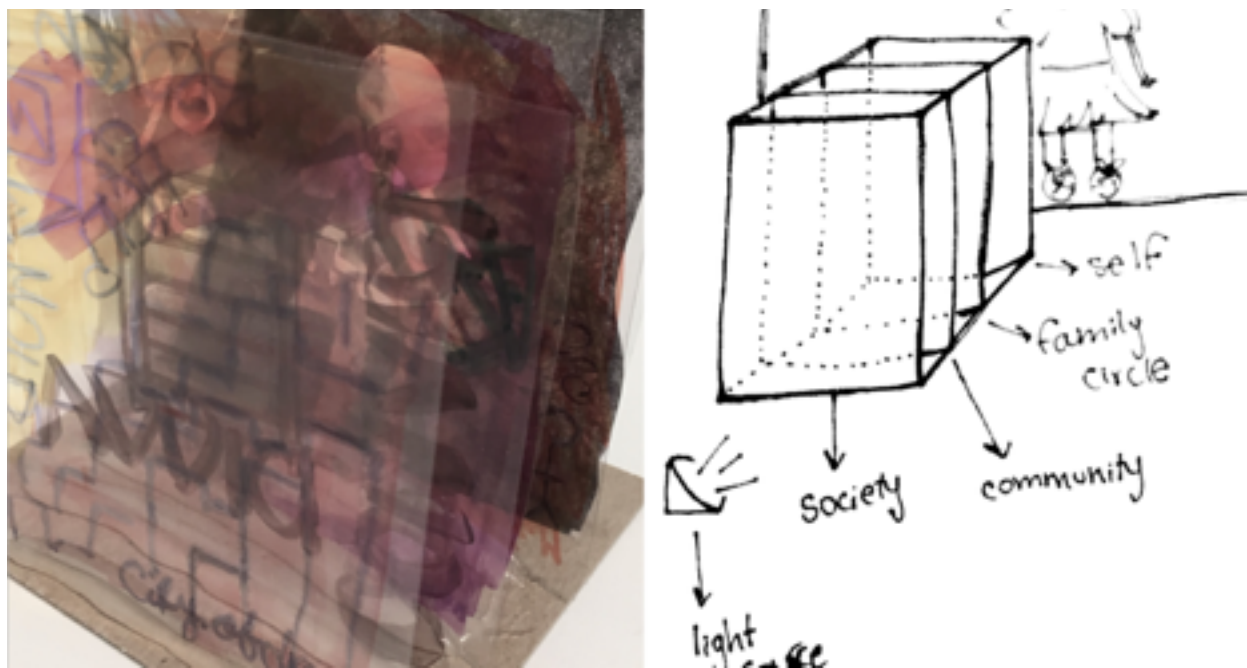
After attending the workshop, I pivoted my concept to focus on narrative medicine. I created a miniature version of a physical installation that consists of a projection through a series of panels. The installation is based off the ecological model which is an "approach [which] focuses on both

population-level and individual-level determinants of health and interventions."[31] Each panel

tells the story of how the child suffered from toxic stress in different spheres like interpersonal,

community, and societal. While the prototype (see above) might communicate the importance of

narrative and context, the scalability of this as a resource was limited. Placing it in an educational

institution was difficult and the idea didn't translate well.

After creating this prototype, I met with Dr. Ruth Gerson at Bellevue Hospital to speak with

about her experience as the Director of the Children's Comprehensive Psych Emergency

Program at Bellevue Hospital. Dr. Gerson reacted to the previous prototype with the sentiment

that most people know abuse and toxic stress is sad, but what most people don't see is the abuse

and toxic stress is the moment that a patient is acting out.[32]

Dr. Gerson heavily influenced my next series of prototypes, which are two videos that show

different perspectives of the same case study: one of the trauma and one of the resulting

behavior. With permission from Dr. Bruce Perry, I used chapter 5 of his book *The Boy Who Was*

Raised as a Dog which focuses on a neglected child who turns into a cold-hearted killer and rapist.

The idea was to show this to students as a primer for a group discussion about understanding a

patient's narrative.

[31] "Ecological Model," American College Health Association, n.d., https://www.acha.org/HealthyCampus/Implement/ Ecological_Model/HealthyCampus/Ecological_Model.aspx?hkey=f5defc87-662e-4373-8402-baf78d569c78.

[32] Gerson, Interview with Doctor Ruth Gerson.

I tested this prototype (see below) twice in two different formats with two and four medical students. The first session, I tested with two second year medical students: Rachel Sarnoff and Safi Ali-Khan.[33] The two students had an in depth conversation about understanding patients and their stories. They seemed to understand what the videos were about fairly clearly.

For the second session, I tested four perspectives (see right) with four different students: Safi Ali-Khan, Trey James,

33 Ali-Khan, Interview with Safi Ali-Khan.
   Sarnoff, Interview with Rachel Sarnoff.

Andrew Lin, and Kimberly Khouri.[34] This session, I learned that four perspectives were incredibly distracting to the students and they missed the point entirely. Instead of narrative, the students focused on other details like the juvenile justice system and support groups. All testing subjects were in my target demographic.

Since the last round of testing, I created two higher fidelity prototypes prepared for testing (see below). I am currently working with Ali-Khan to test in medical classrooms and we are awaiting approval from Dr. Ruth Crowe, the director of the Practice of Medicine program at New York University Langone. If we cannot test in the Practice of Medicine program, we will find other medical student groups to test with. We are planning to test this idea in January and February after narrowing down what the learning outcomes are.

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[34] Ali-Khan, Interview with Safi Ali-Khan.
James, Interview with Trey James.
Khouri, Interview with Kimberly Khouri.
Lin, Interview with Andrew Lin.

Moving forward, I will continue to expand my community of practice and work closely with them to further my research and make sure my prototypes are in line with the wants and needs of medical students and professionals in the field. By continuing to speak with scholars and experts in the field, I will be able to get a better feel of what's missing, where there are problems in the systems I create, and how my designs can better fit into the field of medical education. Because I am not an expert in any of these fields, I need to rely on experts who deeply understand the nuances of medical education, toxic stress, and behavioral psychology. If I stay connected to the research and the field I'm working in, I will hopefully be able to create a solid proof of concept and add to the pool of resources that medical students are working with in order to become better practitioners in the field.

Experience

The class will break into groups of two and each person will watch a different video perspective of the same case study. Students will then be asked to report to their group about their subject and their assumptions. After discussion, the instructor will reveal that the patient is the same and then prompt the students to reflect on their experience and how this has an effect on their future medical practice.

User Personas + Impact

Frank is a 24 year old first year medical student at New York University. He took a year off after graduating to work in a chemistry lab studying the reactions of certain pharmaceutical drugs. He's from Long Island and grew up in an upper middle class family. His parents are both well-

educated and encouraged Frank to go into medicine from an early age. Because his parents are both lawyers, Frank doesn't need to make an income in medical school or take out any loans. He is interested in learning and spends a lot of time at the library studying for school. He also spends his free time riding his bicycle around the city to stay fit and healthy. He is a natural learner and is great at taking tests, but finds difficulty with person to person interaction, especially in uncomfortable situations. He doesn't want to be ignorant to others, but sometimes he doesn't know how to react to situations that he has no context and understanding of personally. He thinks that his natural ability and intellect in the classroom makes up for his difficulty with interaction, so he's not too worried that it will affect him as a doctor.

Frank would appreciate my thesis because it would give him more of an understanding about why patient interaction is important and why putting effort in to understand a patient's situation and context is so crucial for diagnosis and treatment. This may be an uncomfortable experience for Frank, but it will be eye opening and hopefully get him to reconsider his approach to understanding medicine. Through this exercise, he will hopefully understand that listening to a story, communicating it to a team of medical professionals, and trying to understand contextual clues is equally important as the high test grades he strives for.

Sophia is a 23 year old first year medical student at New York University. She is an overachiever and in the top of her cohort. She has significant scholarships, but still had to take out a few loans. Her family is helping her as much as possible. She's from a working class immigrant family from Mexico and is very aware of the socioeconomic and cultural divide in her classes at school and often feels frustrated at the lack of representation of minority groups. She's interested in

participating in Doctor's Without Borders or equivalent programs after she graduates from medical school. Sophia is a skilled conversationalist and can connect well with other people. Medical tests are difficult for her, but because she studies so much, she often does well.

Sophia knows all about context and perspective, so this experience will be nothing new for her. The narratives told are similar to those of her siblings and peers she grew up with. What Sophia will appreciate about this thesis project is that it will facilitate more of a conversation between her and her peers who did not come from a similar background.

Tyler is a 25 year old first year medical student at New York University. Tyler thinks of his home base as California, but has spent much of his life traveling the world and living in other cultures. His father is an international businessman with a very strong influence, so Tyler often tagged along on trips while he was growing up. Tyler graduated with a B.A. in Political Science from Princeton, where his father went as well. After graduation, he took two years off to travel the world and meditate before applying to a medical school that his father donated substantial amounts of money to. While Tyler is considered smart, he isn't the caliber of student that his peers are and often relies on his father's influence to get by. He is a skilled networker.

Tyler has no clue about perspective and context, so he might find this exercise somewhat frustrating. Hopefully, Tyler will be able to understand that the patients he is going to come into contact with have rich and complex stories. After participating in this class exercise, Tyler is going to reflect about his practice and contribution as a future medical provider.

User Scenario Narrative

I had just finished a test and was running late to my "Practice of Medicine" course. This course is usually a waste of time. I get great grades on my exams, but I'm told that I'm not empathetic enough. I don't understand what the issue is. I'm going to tell a patient what's wrong with them and move on. Isn't that what they want? I don't understand why they need to be coddled or listened to.

Anyways, so I get to class and the instructor is talking about a patient's narrative. She breaks us up into groups of two and has each of us watch a different video. The video I watch is about a guy who brutally murdered two girls in his apartment video. I'm immediately judging him and wondering why I have to watch a video about a criminal. I report back on my video to my classmate, noting all important details. My classmate reports that he watched a video about a neglected child. I'm wondering what the connection is. Then, my teacher reveals that this is the same person. I felt bad that I judged this convict and that he was treated poorly as a child. We were then asked to reflect about how this impacts our personal practice. I'm not sure what I want to do as a doctor and I'm not sure about how I will ever know a patient's full narrative, but I'm now concerned about understanding more information.

Evaluation

I set out this semester with the lofty goal of understanding the ins and outs of childhood trauma so that I could make a resource to either mitigate the effects of trauma or prevent it from happening. Of course, one semester is not nearly enough to accomplish that goal. I think a lifetime of work might not even accomplish that goal. Regardless, I still tried to tackle the topic

and I am proud that I stuck to something incredibly meaningful to me. From the start, I found myself in a complicated web of information and did my best to understand it all by meeting with as many professionals as possible and reading as much as I could. Another positive decision I made was narrowing my focus to just look at the medical education system and how cases of toxic stress were easily misdiagnosed. From there, I was able to understand the environment on a deeper level and create more directed and potentially effective prototypes. I was also able to more easily identify my community of practice because of the scope. Because of that, I am now prepared to test well informed prototypes with my target community and get critical feedback that I would not have been able to get otherwise.

Unfortunately, because I spent so much time researching and networking in complex system that I was trying to intervene in, my prototyping process suffered. I was not able to make as effective prototypes in the beginning because of everything I did not know. The more I spoke to professionals, the better my prototypes got. But because of the sheer complexity of the situation, many of my first prototypes were misinformed or possibly even shortsighted. Additionally, my current prototype is very difficult to test and prove for the scope of the MFA DT program. As a result, I'm framing my thesis as the beginning of a very long course of study.

Moving into the next semester, I'm going to focus my efforts on continuing to test my current prototype with medical students and educators and iterate on their feedback. By spending time testing, I will hopefully be able to find better ways of proving or disproving my thesis. I'm also going to emphasize that my final thesis will not be a finished project but rather an exploration of a different framework for medical education. I will also be reflecting on the process and what I

learned when designing for medical education so that I can better understand the process for future projects.

Production Calendar

Key ->	Large Scale User Testing + Documentation + Community Interaction	Aesthetic Iteration	High Fidelity Production
Sprints	**High Priority**	**Important**	**Additional**
Dec 8 - 15	Develop questionnaire + survey for testing	Document + write papers	Test with user group, if available
Dec 16 - 31	Test with user group- CLASSROOM EXPERIENCE AND VISUAL DIRECTION (3 mood boards, 2 videos, 1 classroom script)	Submit to conferences to talk	solidify learning objectives- talk to comm of practice
Jan 1 - 14	Iterate and finalize activity based on classroom testing (gather notes + record)	Finalize visual direction based on testing (create final mood board and gather fonts, color scheme)	Asset preparation- get all background footage shot + design main characters + rough gif motion) Create high fidelity animatic to prove final direction
Jan 15 - 31	Animation 1- character animation (keyframes)	animation 1 background placement	
Feb 1 - 14	Animation 2 character animation (keyframes)	animation 2 background placement	
Feb 15-28	Finalize animations + deliverables for curriculum		
March 1-31	Write white paper	Overflow time	Overflow time

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