

DOMAINS AND PRECEDENTS BRIEF

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Thesis 1
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September 29th, 2016

Key Terms + Glossary

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](https://www.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

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

Domains + Precedents

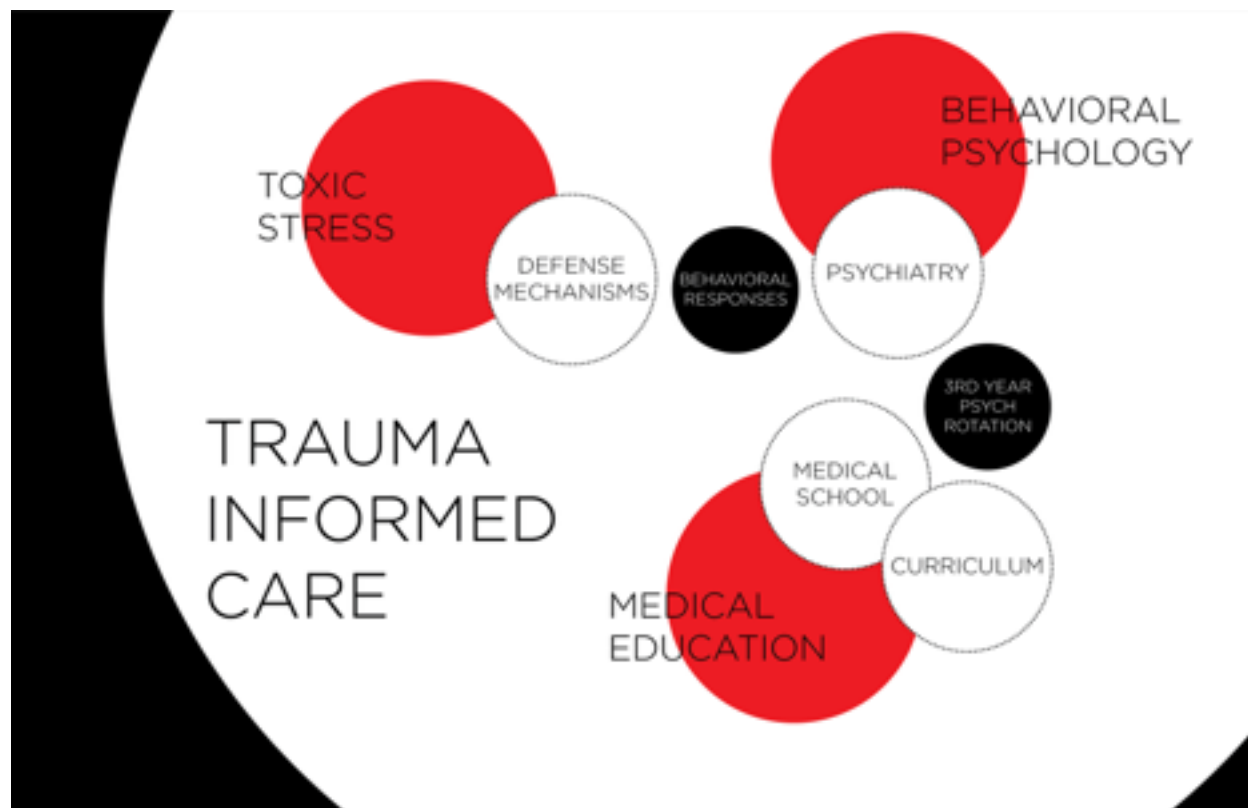
My thesis project evolved out of my interest in the behavioral effects of childhood trauma. I am creating an educational resource for medical students in training to help them better understand behavioral responses to toxic stress, compared to more traditional literature based resources. My thesis is based entirely off of the need for more training resources in medical school. Hopefully with more training and exposure, future medical professionals will be less likely to misdiagnose symptoms of toxic stress as other issues, such as attention deficit disorder or oppositional defiance disorder.

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.⁴ 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, awareness, and safety will greatly impact

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

⁴ Ibid.

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.⁵ 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.⁶ Additionally, understanding different psychological responses from toxic stress is crucial and ties into the domain of behavioral psychology, in which

⁵ Center on the Developing Child, “Toxic Stress.”

⁶ 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 speech centers and decision making areas, are impacted in the short term and long term.⁷ 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 or even an inability to articulate what one remembers, heavily influenced my initial prototypes and sketches.⁸ Van der Kolk also heavily discussed the Adverse Childhood Experiences Survey (ACES), which was a study conducted about the effects of childhood trauma. The ACES study also has a list of potential side effects of trauma, such as constant anxiety and depression.⁹ My first sketches focused on creating a series of robots that displayed behaviors outlined in ACES and from Bessel van der Kolk. 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 cases of neglect and abuse while addressing how their brains changes

⁷ van der Kolk, *The Body Keeps the Score: Memory and the Evolving Psychobiology of Posttraumatic Stress*, 43.

⁸ *ibid*, 100.

⁹ Centers for Disease Control and Prevention, "Adverse Childhood Experiences (ACES)."

and thus impacted their behavior.¹⁰ Perry's approach was more qualitative than quantitative, but his in depth analysis of each individual's case helped me better understand context as well as different narratives of a traumatized child.¹¹

Another key thinker in the intersection of toxic stress and behavioral psychology is George Vaillant. Vaillant created a hierarchy for defense mechanisms caused by trauma or PTSD, which is applicable to toxic stress since toxic stress is a form of trauma. His model categorizes defense mechanisms into four categories ranging from unhealthy to healthy defense mechanisms.¹² His hierarchy is important because it helps me see the breakdown of defense mechanisms and then apply other scholar's knowledge of maladaptive and adaptive behavioral responses to create an even more concrete understanding of toxic stress + behavioral mechanisms.

After doing more research, 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 prototype sketches based on a few behaviors from Van der Kolk's book. Dr. Phillips first helped me better articulate my approach in studying behavior by noting that I was exploring different

¹⁰ 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*.

¹¹ Ibid.

¹² Vaillant, "Involuntary Coping Mechanisms: A Psychodynamic Perspective."

behavioral manifestations of defense mechanisms. He also noted that my thesis exploration could potentially be a tool for medical students in training.¹³ Dr. Phillips 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.¹⁴

From there, I started to shift my thesis research 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.¹⁵ SimMan 3G is a test dummy that has different monitors inside of it. The dummy reacts to different medications and is more interactive, but according to Wilkes, it has a long way to go before it can be used in standard training.¹⁶ 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

¹³ Phillips, Interview with Dr. Blake Phillips.

¹⁴ Ibid.

¹⁵ Wilkes, Interview with Sam Wilkes.

¹⁶ Ibid.
"SimMan 3G."

tool for medical professionals.¹⁷ My thesis has a similar theme of trauma care, but with a focus 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.¹⁸ 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.

After speaking with Wilkes, 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.¹⁹ According to Zoerner, students would most likely be exposed to these ideas in their third year psych rotation, but that students often default to memorizing large

¹⁷ Rizzo and Hartholt, "Bravemind: Virtual Reality Exposure Therapy."

¹⁸ Wilkes, Interview with Sam Wilkes.

¹⁹ Zoerner, Interview with Doug Zoerner.

chunks of the DSM 5 which is a comprehensive manual on all diagnosable psychological disorders. The DSM 5 is the fifth edition and the manual is constantly under revision.²⁰ Zoerner's note about the DSM 5 was intriguing to me because the current version does not include Vaillant's hierarchy of defense mechanisms, but the DSM 4 does.²¹ There is the possibility that students may not even come into contact with this work. While this is not proven yet on my end, this is a direction I need to explore 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.

Another important part of my research has been looking into different precedents and projects that address childhood trauma to see how other people 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 circumstances and very traumatic experiences, but survives by her imagination of a wild, ruthless beast who is very strong.²² Understanding trauma in this project was reliant on the use of storytelling, which may be applicable to the resource for students that I create. Companies like Sesame Street also address trauma and resilience through several projects and apps that act as educational resources

²⁰ American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders Fifth Edition*.

²¹ American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders Fourth Edition*.

²² Richardson, *Beasts of the Southern Wild*.

for parents and children.²³ My thesis takes direction from Sesame Street's approach, but depending on the form and ultimate expression, may rely heavily on storytelling.

Throughout the process, I will continue to expand my community of practice and work closely with them to further my research and make sure my prototype is 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, and how my designs can better fit into the equation. Because I am not an expert in any of these fields, I need to rely on other experts who are more knowledgeable about the field and who understand the nuances of medical education, toxic stress, and behavioral psychology. I can also attend different conferences in both psychology and medical technology or education. Division 56 of the American Psychological Association has a series of webinars and the annual APA conference, but the conference doesn't focus specifically on trauma. Lastly, the National Academics of Science, Engineering, and Medicine is holding a workshop session about education and technology within the sciences. I think that this is crucial for me to attend because my whole thesis is about integrating appropriate technology into the medical education sphere for a better learning outcome.

Because my thesis project focuses on creating a resource for a field that I'm not an expert in nor connected to strongly aside from the content of trauma, the more I can reach out to my community of practice and continue to do research, the better prepared I will be throughout each

²³ "Sesame Street."

iteration of my prototypes. 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.

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