

Increasing Engagement and Decreasing Attrition in eHealth Interventions
(Technical Report)

A Virtue Ethics Analysis of the Puerto Rico Birth Control Trials
(STS Research Paper)

An Undergraduate Thesis Portfolio

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Prospectus

Although my technical work and STS research may not be distinctly correlated, I believe that there are elements in both that can be attributed to a pursuing of how the medical engineering realm interacts with vulnerable populations. They have allowed me to explore how the way medical technology is designed can have a profound impact on the user. However, the medical technology realm is expansive with many different stages, thus I was able to study different areas in the two works. My technical work focuses on how an online cognitive bias modification program can most optimally engage and retain anxious patients, whereas my research explores how the conditions and approach of a medical trial effect how the technology can be developed at the expense of patients. Thus, by working on both projects has allowed me to think critically about how the technology that engineers output profoundly affects people.

My technical work comprises of the designing of a mobile application for the interdisciplinary Mindtrails Calm study, an online anxiety research platform. The program, which evaluates cognitive bias modification for the purpose of reframing the patterns of highly anxious individuals, has faced high attrition rates. My Capstone project aimed to improve engagement and retention through the strategic implementation of *personalization* of training content, and the integration of *implementation intentions* and *goal setting*. We designed a prototype for a mobile interface that enables users to choose domains of anxiety to focus on while leveraging a new journal component through which users can record implementation intentions and goal setting to increase engagement. We then ran tests with real Mindtrails study participants for their feedback on the platform for the purpose of future development

My STS research is also focused on a study for the purpose of developing technology for patients. My research examines an example of medical misconduct and how biomedical scientists' pursuit of technology to better society comes through detriment of patients by demonstrating a lack of virtues. Virtue ethics is a theory that indicates which good or desirable characteristics people should have or develop in order to be moral. Analyzing the nature of a person allows for raising the question of "how to live" rather than what they did wrong in specific circumstances.

My claim asserts that the lack of three key virtues vital to the medical profession: justice, respect, and integrity, are necessary for innovation of medical technology to occur without the expense of removing humanity and ethics that surround the job of being a physician. The goal of my research is to raise questions as to what responsibility biomedical engineers bear through the pursuit of technology in the quickly evolving medical landscape.

I think that while I initially may have struggled to see the connection in the two projects, becoming more educated in both subjects allowed me to have a comprehensive approach as they informed each other. While working on my STS research, I found myself constantly reminded of the skills and methodologies that I learned through the Mindtrails team, and how they contrasted steeply with the egregious details of my case. My technical project allowed me to experience designing and implementing a study with real life subjects in the medical (psychological) realm, so I was able to understand my STS research case that is based in the Puerto Rico Birth Control study. Likewise, by becoming familiar with the virtues that best elevate scientific work, I was able to use them in the process of designing the app and associated user study for the Mindtrails participants.