

Thesis Portfolio

Investigating the Efficacy of Virtual Experiences on Stress Reduction

(Technical Report)

How Cultural Attitudes, Familial Dynamics, and Societal Expectations Affect Mental Health Outcomes and Resource Usage for Asian Americans

(STS Research Paper)

An Undergraduate Thesis

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Sociotechnical Synthesis

This portfolio consists of two papers that pertain to mental health and care. There is an increasing emphasis and awareness on mental illness and the state of mental health in college campuses and workplaces and how they impact personal wellbeing and performance. Poor mental health can affect the community and economy through lost productivity and healthcare costs. It is critical to provide effective mental health support, especially in high stress environments such as workplaces and academia. The technical project explores how stress can be mitigated in an office setting through the use of virtual reality technology. On the other hand, the STS paper identifies and analyzes the unique experiences and factors Asian Americans have that affect how they manifest and react to poor mental health. Both projects focus on providing more support for mental health, whether it be for workplaces or specifically for Asian Americans. However, the technical project examines whether the virtual reality technology is effective in mitigating stress on human participants whereas the STS project analyzes the factors that contributes to poor mental health in Asian Americans and proposes institutional recommendations for care.

Due to rising costs of medical and pharmaceutical treatments, employers are seeking innovative ways to manage healthcare expenses for employees and their dependents. Studies show that 42% of employees report feeling stressed at work and are linked to 15-30% greater healthcare costs (Milenkovic, 2019). This capstone project explores the combination of Attention Restoration Theory and virtual reality (VR) technology as a novel therapy for short- and long-term stress reduction in the workplace. Study participants were guided through a nature or urban environment using the virtual reality program and booth provided by Even Health, or provided with a 2D experience of the same images through a laptop. The participants completed a 10-

minute Cognitive Demand Battery that consisted of a Serial 3's subtraction task, a Serial 7's subtraction task, and a Rapid Visual Information Processing task in order to induce minor stress or fatigue prior to the VR and 2D experiences. Biometric data such as heart rate, blood pressure, and galvanic skin response were collected from the participants at various points throughout study in order to measure the changes in stress levels before, during, and after both the “micro-vacation” experiences. The results were analyzed in Qualtrics and R by comparing the VR experience versus 2D experience and the two sub-conditions, participants viewing nature scenes and participants viewing urban scenes, to determine if the nature scenes in VR significantly reduce stress. Statistical tests were used to determine there was a statistically significant difference between the two conditions and corresponding sub-conditions. Based on the previous literature review, we hypothesize that both the conditions in the VR booth will reduce stress levels in participants to a greater degree than the 2D images, but that the extent will be greatest within the nature condition.

Asian Americans have unique cultural values and perspectives that shape how they experience mental illness. Currently, the American mental health system is not adapted to support their cultural needs, which leads to underutilization of mental health resources among Asian Americans. This underutilization is part of a negative feedback loop as it can contribute to even fewer culturally appropriate resources for Asian American since funding is partially dependent on demand and usage. Underutilization can be attributed to a number of factors, such as cultural upbringing, familial dynamics, and societal expectations. It is important to consider the effects of model minority myth and cultural practice of prioritization of family over the individual when evaluating mental health of Asian Americans. The STS frameworks of technological momentum and coproduction is used identify and analyze these factors in order to

create a mental health infrastructure that is culturally relevant and effective. The analysis is conducted through literature review of historical cases and examination of clinical studies. Recommendations for increased resource usage for Asian Americans include destigmatizing mental illness through community interventions and education, culturally sensitive training for mental health professionals, incorporating Asian American perspectives when establishing clinical best practices, and increasing awareness about current available resources.

Conducting both projects simultaneously has allowed me to gain a better understanding of the multifaceted nature of mental health through both a business and cultural perspective. It has provided me with a more holistic perspective on the topic of mental health. There are different factors to consider when creating a product for mental health support than analyzing the reasons for poor mental health. Researching both topics has highlighted how multifaceted and unique each individual's experience with mental health is, and the many moving components that are involved in treating and supporting better mental health. Understanding these components and how individuals manifest and react to poor mental health is essential, especially in increasingly stressful environments such as the workplace or academia.