Thesis Project Portfolio

Development of a Custom 3D-Printed Ankle Brace for Chronic Ankle Instability
(Technical Report)

Brandy Melville's "Ideal Body": A Technological Politics Analysis of Brandy Melville's One-size-fits-all Model
(STS Research Paper)

An Undergraduate Thesis

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Sociotechnical Synthesis

My technical work and STS research are connected through their association with the one-size-fits-all model, and examining the issues that this model causes. One-size-fits-all means that a specific product is designed to fit a person of any size. This model has been commonly used in various bracing options such as knee braces and ankle braces and is also used in clothing. Companies employ this model because it allows the manufacturer to mass produce the product, thus reducing the cost and hassle of manufacturing. My technical work focuses on issues with the one-size-fits-all model's application in ankle braces and provides a solution to address the shortcomings of this model in addressing ankle instability, while my STS research explores the negative societal impact that one-size-fits-all clothing has.

My technical work analyzes the issues with traditional one-size-fits-all ankle braces and proposes a solution to address them. The specific problem my capstone group and I addressed is chronic ankle instability (CAI), which is the failure of functional rehabilitation after an acute ankle injury. Current bracing options are limited in their treatment of CAI because they use the one-size-fits-all model which ignores the needs of atypical users. In order to address these issues my capstone team and I designed and prototyped a 3D-printed ankle brace that is custom fit to each patient's ankle, has adjustable stability, and is minimally intrusive. These design specifications allow patients to more effectively manage their unique case of CAI and address their specific needs. To execute this project my group and I developed a functional prototype and validated its efficacy by collecting data. The development of this highly specialized device caters to each individual's needs and provides a personalized, cost-effective ankle bracing option to combat CAI and acute ankle injuries.

My STS research also analyzes the issues and negative impact that the one-size-fits-all model has, but instead focuses on its application in clothing. The specific company I focus on is Brandy Melville, a popular teen clothing company. Winner's framework of technological politics is employed to explain how Brandy Melville's one-size-fits-all model exhibits explicit bias that results in the privileging of some groups and marginalizing of others. My claim is that Brandy Melville's one-size-fits-all model reflects the company's idea of an "ideal" body type and intentionally empowers groups that conform to this body type while marginalizing groups that do not. My paper explores this idea by analyzing the company's advertising and physical clothing. The goal of my research is to educate individuals on the harmful impact that the one-size-fits-all model is having on perpetuating the fallacy that the "ideal" body type for teenage girls is slim and above average height.

Working on these two projects simultaneously added value to both works and gave me new insights that allowed me to better evaluate each. My technical work gave me a better understanding of why the one-size-fits-all model is used, which helped me consider perspectives of advocates of the model for my research paper. Similarly, the research conducted for my STS research paper helped me understand the effects that the one-size-fits-all model has and the factors in its design that led to its discrimination of certain groups. Using this insight, I am able to ensure that the 3D-modeled ankle brace I create is an equitable device that can be used by all demographics and groups to treat CAI. In summary, working on both my STS research paper and my technical project together this past year has allowed me to explore the one-size-fits-all model from different perspectives, which proved to be beneficial to the quality of each work.