Socio-technical Synthesis: Laryngology Patient Discomfort and User Configuration

Socio-technical Synthesis
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By

Marissa Marine

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My technical and STS projects work together to address aspects of the socio-technical problem of patient discomfort during in-office laryngology procedures. This is accomplished by developing a technical device design and an understanding of the importance of knowing the user of the device. In what follows, I will describe how the technical project delivered a medical device to reduce patient pain, and how the STS project of analyzing the design of the crash test dummy provides insight into the importance of understanding the diversity of users of our device. I will also explain the benefit I found from working on these two projects simultaneously.

The technical project delivered a wearable vibrational device and an augmented reality experience to reduce patient discomfort during in-office laryngology procedures. The vibrational device is worn on the neck and delivers an appropriate level of vibration to induce tactile stimulation at or around the site of the procedure in order to reduce pain. The device consists of vibration motors encased in silicone, connected by an adjustable band that sits on the back of the neck. The augmented reality experience is a simple game that requires minimal movement and helps to distract the patient from the procedure. This device combines vibratory stimulation with augmented reality to reduce patient discomfort and the need for general anesthesia.

The STS project analyzes the design of the crash test dummy using the framework of user configuration. This project discusses how designers embedded the assumption that the average male is an accurate representation of the whole population of car users into the design of the crash test dummy. I support this argument by analyzing the development of the crash test dummy, as well as many of its physical features. In this case, the configured user is not representative of the whole population of actual users. Specifically, the configured user does not include women, and I analyzed the impact of this on the safety of women in car accidents. The

findings from this project highlight the critical importance of taking into account the diversity of users of our medical device in order to effectively improve the procedure experience for all patients.

Working on both of these projects simultaneously instead of independently was very beneficial. I was inspired to research my STS topic by a presentation given by someone from UVA's Center for Applied Biomechanics which does crash test dummy research. The presenter mentioned the lack of female test dummies, which really bothered me and prompted me to look further into this. My research made me realize how it is extremely important to configure your user as accurately as possible in order for a technology to be effective for all users. I realized the importance of considering the diversity of the patients who will use our device, or else our device could end up being ineffective or even harmful for a user who does not align with our configured user. Completing these projects simultaneously gave me insight into many of the important factors that we had to consider when designing our technical project. This also highlighted the importance of having diverse teams of engineers who understand and can design technologies for a diverse population.

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