Prospectus

Creating Salient eHealth Experiences
(Technical Topic)

Configuring the Anxious Digital User
(STS Topic)

By

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Combatting Attrition in eHealth

Online health treatments, or eHealth interventions, are a promising alternative to traditional mental health treatments. Unfortunately, these health modules are rarely successful due to high attrition rates. In light of this widespread problem, our team will conduct a redesign of one such online program: MindTrails. Our goal is to incorporate stronger implementation-intentions, a goal-forming strategy, and to add elements of personalization to the MindTrails application and website. Both of these subprojects can help mitigate MindTrails' staggering attrition rate.

In the past, eHealth programs like MindTrails have attempted to engage users by incorporating gamification, design elements found in video games, and other techniques meant to augment user retention. Engagement techniques have been developed by powerful technology companies that invest in good design and compelling user experience to keep users hooked. These apps often capitalize on psychological research around engaging users with an app and have been seen to foster addictive behaviors. It is imperative that we better understand how designers can take advantage of sensitive or vulnerable users. Striking an appropriate balance between designing for users' clinical specifications and designing for user experience requires a thorough understanding of the user as both an anxious individual and as a consumer of digital media and entertainment. The User Configuration framework will be applied to MindTrails to understand how the designer's ideas about the users are intentionally and unintentionally embedded into the MindTrails platform. Claim should go here.

Creating Salient eHealth Experiences

Anxiety is widespread in the United States ("Facts & statistics," n.d.) but there are many barriers to treatment such as cost, availability of professionals, and cultural stigmas against receiving mental health treatment. While face-to-face therapy is relatively common (Eisenberg, Golberstein, & Gollust, 2007, p. 2), eHealth interventions afford a cheaper alternative via the Internet, providing a more accessible anxiety treatment. The National Institute for Mental Health funds one such eHealth intervention, Mindtrails, through the University of Virginia to help bridge the treatment gap.

Mindtrails is an online anxiety management tool that employs cognitive bias modification (CBM) to identify and redirect negative thinking patterns. Specifically, MindTrails leverages cognitive bias modification interpretation (CBM-I), a branch of CBM that uses repeated activities to help users overcome negative biases they might have towards neutral situations (Bowler et al., 2012). Users are presented with two types of tasks which allow the system to identify general thought patterns that may contribute to anxiety.

The first task challenges users to assign positive emotions to neutral scenarios. To accomplish this, users drag the missing letter to complete a word describing a positive reaction displayed on the screen. The second task prompts users to imagine and respond to different scenarios that might induce anxiety. This task uses CBM-I to address the underlying biases that contribute to anxiety in non-threatening situations. The purpose of these scenarios is for users to face everyday situations that cause anxiety and then to prompt a healthier response. Repeated exposure to these scenarios can help users overcome their negative biases towards neutral events (MacLeod & Mathews, 2012). It has been proposed that introducing implementation-intentions, if-then statements, could make these scenarios more salient and effective in the user's real life.

Like other eHealth interventions, Mindtrails is plagued with high attrition rates and poor user retention. In previous years, Mindtrails' dropout rate was as high as 77% (Stevens, et al., 2018), meaning approximately three out of every four users failed to complete all five lessons in the Mindtrails curriculum. This is attributed to a bland design, an excessive amount of wordy questions, and a weak personal connection to users. The current scenarios are generic and do not reflect the background or preferences of the user, which results in less relatable scenarios. Additionally, these scenarios are not actionable and users are not strongly prompted to set real life goals.

Development of improved engagement strategies in MindTrails may help establish better practices around eHealth interventions. If the implementation of these strategies is successful, similar approaches can be suggested to other eHealth providers to help further the understanding of anxious users and better-quality treatment for its users. Research conducted in previous years by the Mindtrails team suggests that incorporating more personalized and goal-focused interventions could help decrease attrition. The initiative has already outlined several gamification techniques that could improve engagement and user experience among the users of MindTrails (De Paiva Azevedo et al., 2019, p. 1).

Our team will update the design of MindTrails, establish appropriate use of personalization, and develop scenarios that include implementation-intentions, if-then statements, to help with goal setting. Inclusion of a personalization aspect where the questions are adapted to the user's gender, age, and life situation could make the interventions more relatable. Creating a stronger emphasis on goal setting and follow-up may encourage users to return each session.

The year-long project will conduct a redesign of MindTrails that establishes an appropriate amount of gamification and introduces more relatable scenarios. The backend framework for this design will be developed in React Native and the user interface will be produced and prototyped in Figma. Once a working version of this design is complete it will undergo usability testing. The testing will likely include focus groups and interviews. Some new features may be piloted on the existing version of MindTrails to determine whether added personalization or if-then scenarios have any impact on attrition rates.

Configuring the Anxious Digital User

MindTrails is designed to help users who struggle with anxiety. The original idea of the users revolved around the user's anxiety, and MindTrails shaped its content and design to meet the clinical needs of this anxious user (Teachman, 2018). Despite the emphasis on providing quality treatment, MindTrails' attrition rates remain high. MindTrails incorporated gamification into its design in an attempt to mitigate the high attrition. Gamification is the application of badges, levels, and other competitive elements traditionally used in video games to non-gaming contexts. Although gamification could help to increases user engagement, it can also have a negative impact on users. Preying on a healthy user's sense of competition and natural reaction to continuous stimuli, like notifications, can lead to technology addiction (Freed, 2018). Therefore, implementing gamification in MindTrails' design demands a more nuanced understanding of its users. The process of gamification has created a second version of the MindTrails configured user. But is this second generation a closer match to real users or does it stray even farther than the original conception?

MindTrails argues that its incorporation of gamification will enhance the experience of its website and ensure users will return to benefit from its services (De Paiva Azevedo et al., 2019). This view overlooks how configuring the user as a young digital consumer may not align with actual users and could ultimately exacerbate the problem of anxiety. Psychological research suggests that using gamification features can actually induce anxiety (Rosen, Whaling, Rab, Carrier, & Cheever, 2013). MindTrails' revised image of the user as digitally savvy, young, and competitively motivated may not correspond to the profile of actual users with anxiety, potentially creating a barrier between the treatment and the users.

To understand the relationship between the configured user and product design I will analyze MindTrails' interface using the user configuration framework (Woolgar, 1990). Woolgar's metaphor of designers as authors describes how the interface is configured for an intended user who may not align with real users. Similarly, writers share their perspective in a script that is left for readers to interpret. As Woolgar emphasizes, what a script says can be different than what it means to readers and the experience of actual users can be very different from the purpose of the interface. For this reason, the relationship between the experience developed for the configured user and the impact on actual users must be understood. By analyzing differences between the configured user and the real user we might better understand the requirements of the real user.

If there is a mismatch between the configured user and actual user, MindTrails users will not benefit from its service. Understanding the relationship between designers' ideas and the interaction of users with products, and how these ideas influence user interactions, can help describe the risks involved in a mismatch in the configured and actual user profile (Harris,

2016). In the event of a mismatch, users might further disengage and fail to receive the help they sought out.

In this research paper, I will first look at how MindTrails' original interface caters to the user as an anxious individual and how this treatment is embedded in the design. Next, I will examine the updated interface, which revolves around the user as a digital consumer. Both designs will be compared to the needs of the real user to determine the possible drawbacks. These analyses will determine the extent to which the configured users correspond to real users.

A Multi-Faceted Approach to Engaging Anxious Populations

The MindTrails initiative will establish a new design for the website that includes elements of gamification and delivers CBM-I based treatments to help engage users. The new design will address both the user experience of the interface and its content with the broader goal of decreasing attrition. The scenarios in the redesign will place a stronger emphasis on setting and achieving goals. The technical portion will establish whether popular engagement boosters will work for eHealth intervention. The STS research paper will help provide a better understanding of how designers configure and design for their intended users, looking specifically at how mismatches between configured and actual users could exacerbate the problem of attrition. This paper will look at design techniques and options made available to vulnerable user populations and whether or not these are appropriate for the actual users. For MindTrails to be successful it must balance the engagement techniques required to reduce attrition with the risks involved with designing for anxious users. Before designers attempt to boost engagement in mental health modules with gamification and persuasive design found in

popular apps, the impact of these designs on users other than well-adjusted, healthy adults should be understood.

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