

An Online Health Community for Preventive Health Behavior

A Social Cognitive Perspective on Audio-Based Peer Support for Families with Low-Socioeconomic Status

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Storywell is a family fitness app with an online health community (OHC) aimed at supporting preventive health behavior (i.e., physical activity). Guided by Social Cognitive Theory and its social modeling process, I investigated how an OHC within a fitness tracking app can drive adoption, nurture engagement, and help develop health attitudes that facilitate health behavior. Given that physical inactivity is linked to socioeconomic status, I conducted the evaluation studies with families of low socioeconomic status backgrounds. Informed by these studies, I shared design opportunities for designing OHCs aimed at preventive health behavior in marginalized communities.

Keywords: family exercise, low-socioeconomic status, online health community, social modeling

1 INTRODUCTION

Regular physical activity provides many health benefits, yet people with low socioeconomic status often found it hard to be active. Scientific evidence is clear that regular exercise can reduce the risk of chronic illnesses, enhance mental health, and improve quality of life [22]. However, living an active life is challenging for many who are not well off. In the United States, people with low income and non-college degrees, as well as minoritized ethnic and racial groups, are less likely to meet the recommended exercise recommendations [19]. This inactivity is often due to the perception of crime and the urban built environment that inhibit active living [6, 10], which are rooted in unjust public policies. Therefore, given the physical activity disparities, preventative interventions on physical activity must be prioritized to equitably support low socioeconomic status households.

Fitness trackers have the opportunity to support physical activity. They are relatively affordable and provide a means of behavioral self-monitoring. With features like goal-setting [18], visualization [5], and gamification [15, 27], these trackers can support people to develop exercise behavior. Put more broadly, fitness trackers belong to a class of tools called personal informatics (i.e., tools for collecting and reflecting on personal data) [12].

However, although fitness trackers are promising tools, my fitness tracking studies with families of low-socioeconomic status neighborhoods show that families rarely reflect on their fitness data [26]. Parents who did reflect on their fitness data often had health concerns that direct their focus on physical fitness. In contrast, parents who did not reflect on their data often had other pressing caregiving concerns that led them to deprioritize physical activity.

To make sense of this conundrum, I brought a historical context of personal informatics for health [9]. Historically, personal health informatics were seen as tools for patients to have a more active role in their health. Falling under the umbrella of patient-centered care, such tools shift away from the paternalistic model of care and towards collaboration to produce positive health outcomes. In other words, personal health informatics tools are not meant to completely exclude health experts. Instead, personal health informatics tools were meant to facilitate patients, health experts, and the patients' social environment to work together and support the patients' health behavior.

Thus, I argue that the limitation of fitness trackers to facilitate health behavior change is due to the oft-missing guidance on what the user should do next to increase their physical activity. While self-monitoring is beneficial to health behavior, its value is limited if (1) the users do not develop the knowledge, beliefs, and skills that support their ability to perform the behavior, nor (2) gain a sense of whether their behavior-as-tracked is adequate [1, 2]. To investigate how families can develop physical activity with the help of their peers, I developed Storywell, a family fitness app with an

online health community (OHC) component [24, 25]. While OHCs are typically being used by people who have health concerns or goals [8, 11, 13, 20, 21, 23], preventive OHCs provide online support spaces for people who deprioritize preventive health because they have other taxing life priorities, especially in marginalized communities

2 STORYWELL AND SOCIAL COGNITIVE THEORY

Storywell is a fitness tracking app designed to support families to be active by providing these three features. *Social rewards* feature gives storybook chapters when families made physical activity progress as tracked by their fitness wearables [25]. *Social reflection* feature allows families to audio-record their own health stories. *StoryMap* feature that allows families to (1) see how active other families were, and (2) listen to audio-recorded stories about other families' experiences in being active. Specifically, families who lived near their area. The StoryMap is an OHC and is aimed to facilitate exercise social modeling among people who may not have health concerns yet.

To protect the user's privacy, Storywell asks the participants not to share personal information in the story then randomly offset the story location on the map. Participants can also limit their personal information from their profile.

Storywell's design was guided by Social Cognitive Theory (SCT), a well-established theory of human cognition and behavior [1, 2]. In SCT, human behavior is influenced by humans' cognition as well as their social environment. Furthermore, human behavior is facilitated by two key attitudinal factors. *Self-efficacy* is a person's belief whether they can perform the behavior successfully. *Outcome expectations* are the beliefs about what would happen after performing the behavior. In the case of physical activity, self-efficacy is the belief about one's ability to be active whereas outcome expectations are one's beliefs about the positive and negative effects of being active.

Central to SCT is social modeling, in which humans learned new behavior by observing the behavior of other people [3]. Storywell facilitates social modeling symbolically, by enabling families to learn through verbally-told audio stories. Since the stories came from families within their area, the stories have a greater chance to receive users' attention.

I qualitatively evaluated Storywell with 29 families of low-socioeconomic status backgrounds in 2019 and 2020 [24, 25]. The participants were recruited through a community organization serving low-income families. Through multiple interviews, I collected a total of 56 hours of recordings. These recordings were transcribed and analyzed using the constant comparative method [7]. The findings were published in 2020 and 2021 [24, 25].

3 STORYWELL AS AN ONLINE HEALTH COMMUNITY (OHC)

During the four-week study, caregivers shared 86 audio-recorded stories ($M = 6$ stories, $SD=6$) [24]. Using the findings from the evaluation studies, and guided by SCT, I synthesized the design opportunities of OHC for preventive health.

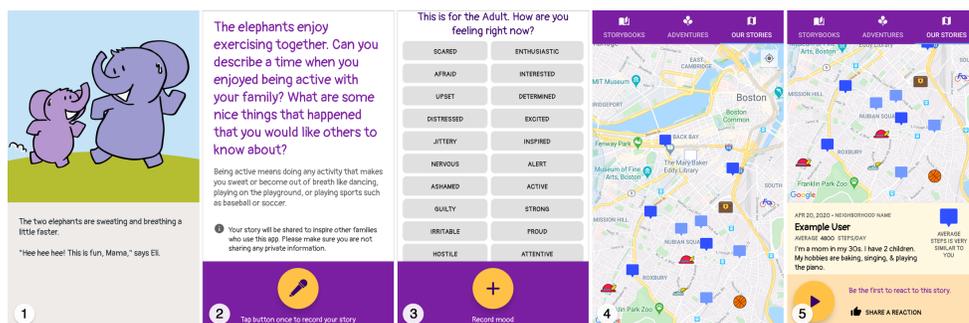


Figure 1: Storywell screenshots. (1) A family begins with reading a storybook, then (2) the caregiver shared a community story. After that, (3) the caregiver logs their emotions. (4) Families can see other families' stories on the StoryMap, and (5) listen to the stories.

3.1 Aligning OHC Design with Users' Aspirations Supported Adoption

Storywell participants joined and engaged with the OHC were not simply because of health concerns but also because using Storywell was aligned with their proximal and distal goals [25]. The parents were interested to try Storywell because they envisioned their children can improve their reading skills from the social rewards storybooks in the app. Thus, while pursuing their main aspirations, the families gained the opportunity to develop preventive health behavior.

This is not to suggest that the parents did not have wellbeing aspirations for their children. Rather, there is a greater desire to support their children's education so that their children will have employment and financial stability. The goal is to ensure, their children will be able to live in a safer neighborhood – which is also a wellness aspiration. Here, education was seen as a means of social mobility, and such an aspiration encourage the parents to use Storywell its OHC.

3.2 Nurturing Relationships Nurtured OHC Engagement

Although the long-term aspirations led parents to use Storywell and participated in the OHC, it was the social connectedness that appeared to nurture their engagement. Parents in the study reported they enjoyed being able to bond with their children [25]. They also liked learning that other parents are trying to support their children's wellbeing because it gave validation of their efforts [24]. Similar to prior work on a social fitness dashboard [17], Storywell's OHC created a social norm that being active is valued.

Indeed, the need to belong is an innate human need facilitated by frequent interactions, stable relationships, and mutual caring [4]. Thus, I suggest that nurturing OHC engagement can be facilitated by incorporating features that highlight a sense of reciprocal caring as well as a sense of validation.

3.3 OHC Provided Data and Stories That Develop Positive Health Attitudes

By facilitating the exchange of fitness data and audio stories, Storywell's OHC enabled parents to learn adequate goals, the steps to be active, and the joys of family physical activity [24]. In other words, Storywell's OHC supported social modeling by providing the necessary (1) information of optimal goals which supports self-monitoring, (2) information that enhanced the self-efficacy to be active, and (3) information that reinforced positive emotional outcomes of physical activity. This finding echoed with other findings in the sociality of healthy eating tools [14, 16].

In short, from the perspective of SCT, OHCs for preventive health is a space for social modeling in which the members can learn from each other and develop the necessary attitudes for acquiring health behavior – specifically self-efficacy and outcome expectations.

4 CONCLUSION

Through the deployment and evaluation of Storywell, I identified three design opportunities for designing an online health community aimed at supporting social modeling for preventive health behavior. These three design opportunities are: aligning aspirations, nurturing relationships, and data-stories exchange. The evaluation study was conducted with families of low socio-economic backgrounds who – in the United States – typically face a greater barrier to be active. Thus, this work highlights the design opportunities of OHCs for supporting preventive health behavior among marginalized communities. Through this workshop, I am interested to learn how these findings confirm and contribute to the body of research in online health communities.

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