Study On Active and Adaptive Behavior Change Support System

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Abstract:
Numerous technologies exist for promoting a healthier lifestyle. These technologies are collectively referred to as "Behavior Change Support System" (BCSS). To effectively induce a behavior change, it is essential to present information to users and let them comprehend it. However, the existing systems tend to adopt a passive approach that only reports the user's status upon opening the app. The existing systems also rely heavily on quantitative data representations, which has been shown that this approach might harm users' motivation and lead to a failure of promoting behavior change since it is hard to understand the meaning behind the data. Even though these systems provide explanations for the data, they would face another issue that different communication styles of explanations for the same data may lead to different outcomes. Therefore, an approach that is more active and more adaptive is needed. In this dissertation, we focus on two challenges to realize the active and adaptive behavior change support system: 1) the design of the active BCSS, and 2) the design of the active and adaptive BCSS that considers different communication styles. Before realizing the active and adaptive approach, it is necessary to investigate the impact and feasibility of active BCSS on inducing behavior change. Regarding the first challenge, we designed and developed an interactive signage system that actively talks to the passing user for promoting behavior change. Through the experiment, we confirmed that the proposed approach can effectively induce behavior change with low labor and lot time cost. For the second challenge, we extended the system to the smartphone platform so that the system can track users' status and interact with users in real-time. The extended system focuses on the improvement of physical activity as the common physical activity support systems are precisely the systems that rely heavily on quantitative data representations. The extended system promotes users to walk more by providing different levels of indirectness and elaborateness of explanations for the quantitative data. The result of the experiment indicated that our system had a positive effect on increasing the users' daily step count. The indirect and elaborate communication style led to the highest step increase rate (32.8%), while the direct and elaborate and direct and concise communication styles led to the lowest step increase rate (4.82%, 5.0% respectively).