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Designing Digital Applications to Promote Physical Activity and Healthy Eating among Young Population

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Abbreviations

AI: Artificial Intelligence; GPS: Global Positioning System; m-health: mobile health; PA: Physical Activity

Letter to the Editor

The study by Grieben et al. [1] recruited 36 young office workers to discuss the design points for interventions using digital technology for promoting physical activity (PA) and healthy eating. One of the major concerns regarding the use of digital applications is to sustain user engagement over time [2-4]. A conclusion of the aforementioned study emphasizes that providing users with feedback is an effective strategy for users' engagement to take into consideration in the design phase. We totally agree with their results showing that tailored feedback can contribute to raising users' engagement in PA. We previously showed similar results in a study targeting training platforms to promote wellness, self-care and PA in the home setting [5]. Participants in several studies reported feeling more motivated when using a digital application that can provide both performance information and an action plan for improvement. However, including feedback systems in digital applications may not always have a positive outcome, especially if the feedback does not match well to the users' performance or if it is not accurate enough. Recent studies point that real-time feedback, or feedback provided as soon as possible have a more positive impact in users than delayed feedback [6,7]. Planning the type, frequency and amount of feedback to provide may be a challenge for engaging different users in PA. Determining how the feedback is going to be communicated is also a key factor to consider when designing the interfaces of this kind of interventions. This is one reason among many that justifies the need of high interdisciplinary teams (high number of disciplines included in the team's member background) to design and implement this kind of interventions. Historically, digital technology has been designed by teams of mainly technologists. However, technology is a tool that drives all other important aspects of the intervention. In our experience, including practitioners, artists and sociologists among other researchers resulted in a more efficient design of the solution from several

points of view, which also integrates important elements of behavioral theory.

As part of the results of the study done by Grieben et al. [1], we see that participants proposed video clips or even full videos of workouts as guide for PA. However, on the other hand, participants expressed their desires to have an interactive platform, but with some reservation and concerns regarding interacting with other human trainees and sharing data. Previous experiments in several fields demonstrated that including human-like interfaces such as embodied avatars can improve the user-application interaction. Using speech techniques, intonation and emotional interaction such as humor, can also have a positive impact on users' motivation [8-10]. We believe that training platforms including embodied trainers may provide users with two main advantages: a human-like interface that users can follow and mimic when performing exercises, and a highly interactive platform with human-like communication. These features are currently possible given the addition of artificial intelligent (AI) techniques to carry human-like conversation, and the current computational power to render high quality animations in most available platforms including mobile devices.

Several participants in the study by Grieben et al. [1] wanted to document their development and personal successes, ideally using self-monitoring tools. Previous studies targeting platforms for PA incorporated the use of tracking systems and the ability to keep past training tracks. In that case, users also reported that the feature was very convenient and useful for motivation in long-term training [11,12].

Regarding keeping users engaged in the long-term, several participants in the study by Grieben et al. [1] reported the convenience of using this technology in the form of an app on their smartphones. We developed a set of mobile apps to promote health (m-health) among a population of young children and are currently in the process of evaluating its efficacy. M-health applications present several advantages when compared with web-platforms. Modern mobile devices integrate up to 12 different sensors, including accelerometer, gyroscope and GPS that can be used as a tracking system to monitor PA and keep a diary of performance. In addition, most mobile devices

are internet capable, which makes it possible to include effective reminders through notifications systems to keep users engaged in their goals that are not intrusive [10,11,13].

In addition to tailored feedback and reminders, the need for goal settings has been demonstrated in this and several other studies. We are in the process of evaluating two different interventions targeting weight loss: healthy eating and PA. Given that these two interventions share the same goal, we believe that merging planning phases within a training program and monitoring users' success to improve feedback cues may reduce drop-out rates for long-term goals.

One important strategy that was not presented in the study by Grieben et al. [1] is the use of gamification, which is the technic of applying game-like features to digital applications to achieve a higher user's engagement. The gamification technic may also include augmented or virtual reality technology, which has also been proved to be highly engaging for goals such as PA [14]. Serious games and exer-games are becoming popular to motivate the use of m-health tools. This is particularly important among young population, who may be more prompted to play videogames than the elderly. However, elderly may also become more aware of the positive impact of digital technology if presented in a game form [15-17].

Disclosure Summary

The authors have nothing to disclose.

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