

Investigating Efficacy of Regulatory Fit Theory in Design of Persuasive Systems that Promote Physical Activity

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1 Background

Although the benefits of regular physical activity on individuals' health have been demonstrated extensively through research, motivating people to perform regular physical activity has proven challenging. To achieve this goal and to help individuals adopt a healthier lifestyle, many technological interventions have been designed that are grounded in well-known behavior change theories. These interventions employ a variety of persuasive mechanisms to influence users' attitudes and behaviors [1,2,3,4]. One commonly used strategy involves tailoring the communication between a persuasive system and its users. Research shows that different individuals may react to the same persuasive message differently [5,6]. Thus, in order to increase a system's efficacy, its messages should be adjusted to individuals' psychological characteristics [7].

Over the last decade, researchers have investigated a variety of tailoring approaches to use in the design of the persuasive systems. For example, based on a psychological construct named Need for Cognition [8], Kaptein and colleagues [9] developed a Susceptibility to Persuasion Scale (STPS) that measures individuals' susceptibility to six different influence strategies, including commitment, scarcity, authority, and consensus. Other examples include the work of Halko and Kientz [10], who used tailoring based on the Big Five personality traits [11] to design a system that promotes exercising, or the work Orji and colleagues [12], who used tailoring based on Bartle's taxonomy of gamers [13] to design a persuasive health game that improves individuals' eating habits.

These are only a few examples of studies in which tailoring of persuasive communication was done according to users' psychological characteristics. Although in recent years numerous other studies have also examined diverse tailoring strategies, many questions remain unanswered, and there are not sufficient guidelines on the best approach for tailoring as a persuasive mechanism.

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2 Objectives

To address this issue, by drawing on the public health communication and consumer psychology literature, we decided to examine the efficacy of a physical activity promoting system that sends its users messages structured based on the concept of regulatory fit.

Regulatory fit theory, introduced by Higgins in the late 1990's [14], describes two different self-regulatory orientations that individuals are inclined to while pursuing their goals: promotion-orientation and prevention-orientation. Individuals with promotion-orientation employ a motivational strategy that focuses on accomplishment and potential gains, whereas individuals with prevention-orientation employ a motivational strategy that focuses on safety and security, and preventing potential losses. According to Higgins, when individuals' self-regulatory orientation matches their goal-pursuit strategy, they are more engaged in the process of pursuing their goals.

This theory has played an important role in persuasion [15], and since its introduction many public health scholars have conducted studies to investigate this tailoring strategy's efficacy in communicating health related content that can persuade individuals to adopt a healthy lifestyle [16,17,18].

Health messages can be framed to have either a promotion or a prevention focus. An example of a promotion-focus message is: *Regular physical activity can lead to better physical health*, and an example of a prevention-focus message is: *By adding 10-minute bouts of regular physical activity you will reduce your risk of heart attack and stroke*. Research shows that promotion-orientation individuals are more influenced by promotion-focus messages, and prevention-oriented people by prevention-focus messages [19].

To examine the efficacy of employing such strategies in designing persuasive systems that promote physical activity, we designed and developed an email intervention that sends participants daily health messages. The messages were adapted from those used in similar studies which investigated the effect of message framing to promote physical activity and their persuasiveness were rated in a prior study by a group of participants whose demographic characteristics matches those of the current study [20].

Over the period of the study, participants are repeatedly exposed to messages that are framed to either match or not match their regulatory orientation. We postulate that using this approach to tailor system-user communication increases the chance of participants adopting target behavior—in this case performing regular physical activity.

3 Method

Sixty participants with sedentary lifestyles and between the age of 18 and 65 are recruited. The study takes place over 23 days. On Day 1, individuals interested in participating are provided with a web link, where they can read the study information letter, containing a brief explanation about the study purpose and procedures, as well as a consent form. Additionally, they are asked to provide an email address, where the health messages can be sent over the period of the study. After indicating their consent to

participate, they are asked to complete a demographic questionnaire, and only those who meet the recruitment criteria (performing less than 150 minutes moderate physical activity per week) are allowed to continue to the experiment. Consequently, participants are required to answer a set of questionnaires that identifies their psychological characteristics (i.e., regulatory-orientation and self-efficacy). Once the questionnaires are answered, participants are assigned to one of three experimental conditions in a counter-balanced order, in which the type of health messages varies. In Condition 1, participants receive messages that match their regulatory orientations, and in Condition 2, participants receive non-match messages. In addition, there is a control group (Condition 3) in which participants only receive reminders (as opposed to tailored health messages).

Between Days 2 and 15, depending on their experimental condition, the participants continue receiving health messages that match or do not match their regulatory orientations. Each day and after reading the message, they answer a short online questionnaire (through a link provided in an email) that investigates their perceived persuasiveness of that message, and to what degree they are motivated to go for a 20-min leisure-time brisk walk that day. Additionally, they report how many minutes they did go for a leisure-time brisk-walk the day before (after Day 2) and if they did not, why?

On Day 16, participants complete a questionnaire that measures their self-efficacy in performing regular physical activity within the next 7 days. Between Days 16 and 23, they receive no messages, and on Day 23, they answer how many minutes, in total, they did go for leisure-time brisk walks during the past 7 days. On this day, they are required to complete the physical activity self-efficacy questionnaire for the third time. At the end of study, they are entered in a draw to win a \$200 gift card for compensation.

4 Results

This is an on-going study and we are still collecting data. The anticipated completion date is May 2017. We anticipate that participants' levels of physical activity and self-efficacy, as well as their intentions to become more active would be higher in the match condition (Condition 1) compared to those in other two conditions, suggesting that using tailoring health messages based on Higgins' Regulatory Fit theory will increase the efficacy of the persuasive physical activity intervention.

5 Conclusions

The outcome of this research will demonstrate if and how a tailoring mechanism grounded in Higgins' regulatory fit theory can be effective in persuading people to become more physically active. It will also provide a deeper insight into the relationship between regulatory fit theory, persuasive message construction, and individuals' physical activity behavior.

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