

Do Computer-Generated Text Messages Motivate Teenage Girls to Exercise as Much as Human Sent Ones?

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Abstract. Levels of physical activity begin to decline during adolescence, particularly among girls. Research aimed at interventions to reverse this decline suggests that support from friends and family is correlated with higher levels of physical activity. Text messaging is a popular communication tool for teenagers and automated text messaging systems have shown promise in smoking cessation programs and diabetes management. Why is this so? Is it because the system acts as a nagging reminder or that it is perceived as someone looking out for you? We are currently conducting a user study to compare the effects of computer-generated messages versus those sent by a real person in the girl's social support network on the uptake of physical activity. In this paper we discuss factors that may impact the persuasiveness of such a system, suggesting that automated messages will not work as effectively as those sent by a human.

Keywords: Persuasive technology, text messaging, social support, teenage girls

1 Introduction

Physical activity is an important component of a healthy lifestyle, contributing to a decreased risk of obesity and chronic diseases. Although increased physical activity among teenagers has been recommended for many years, levels still decrease during these formative years, particularly among adolescent girls [8]. This is of particular concern because the rate of obesity among adolescents has tripled in the past 20 years [9]. One approach is the Trial of Activity for Adolescent Girls which aims to identify interventions that will reduce the decline of physical activity in adolescent girls. The results of this trial reveal verbal persuasion, modeling, and social support from family and peers help girls become more physically active [13, 16], a finding supported in other studies [4, 10, 15]. We are investigating whether text messages tailored to encourage teenage girls to increase physical activity are an effective intervention.

2 Can text change our norm?

Computing systems that are designed to change people's attitudes and/or behaviors are what Fogg calls *Persuasive Technology* [5]. The use of text messaging as persuasive technology to motivate behavior change is also grounded in social cognitive theory [2] in that text messages can be tailored to support personal goals, enhancing motivation through increased self efficacy [3]. Health promotion

professionals (e.g. teachers, coaches, exercise specialists) do not have the resources to send personal text messages to the girls they are trying to help on a daily basis. Therefore an easy and inexpensive application that prompts girls to exercise may be a useful tool. However, the impact and acceptance of this type of system has not been evaluated. We seek answers to questions like Will girls respond to such messages or simply ignore them? We would like to determine if computer generated messages are as persuasive as those from a human. Social ecological theory assumes that health behaviors are shaped by environmental subsystems including the network of social relationships in which people are embedded [1], suggesting that messages from a human may be more effective than those generated by a machine.

2.1 The Promise of Text Messages

Sweet Talk is a text-messaging support system that is designed to help improve compliance with insulin therapy in Type I diabetic adolescents [6]. The system allows the teen diabetic to set goals which are reinforced by daily text messages that serve as reminders and encouragement. Although not shown to improve glycemic control, the system was shown to improve self efficacy of this traditionally difficult to manage group [6]. Eighty two percent of the patients reported that they felt the system improved their diabetes self management [6].

Rodgers et al conducted a randomized trial of a smoking cessation program that sent personalized text messages, from a database of over 1000 messages, on a daily basis [12]. Services included Quit Buddy which placed participants with similar characteristics and quit days together, as well as TXT crave which sent tips for cravings. The researchers found that of 1705 smokers participating in the study, more participants had quit at 6 weeks in the intervention compared to the control group: 239 (28%) versus 109 (13%) [12].

Text messaging has also been studied as a relapse prevention intervention for patients in a bulimia nervosa aftercare program. This program was not well accepted with over 12 of 14 participants suggesting they would not participate again [11]. The researchers found that some of the patients viewed the lack of personal contact as negative and some found the program “too computerized” stating that the content of the text messages were “impersonal” or “patronizing” [11]. One participant commented that “Text messages are usually from friends so when I was contacted by yourselves I felt that therapy was invading my life.” [11]

Although text message support systems show promise as means of motivating adherence to insulin therapy and smoking cessation, it is not clear that this type of system will motivate increased physical activity. We feel this is an intervention with potential and that a system designed to promote physical activity in girls should be evaluated. Next we describe considerations in the development of such a system.

3 Factors that may impact persuasiveness

Why was the automated text messaging system effective for smoking cessation and diabetes management? Is it because the system acts as a nagging reminder or that it is

perceived as someone looking out for you? Further, why were patients turned off by a similar system designed to prevent relapse of bulimic symptoms? Was the system too impersonal? These questions and others are ones that we would like to examine in our research. The following are a list of factors that may be important for the success of a text messaging system to encourage teenage girls to be more physically active.

3.1 Personal Connection with the Message Sender

Given the established importance of support from peers and family on teenage girls' physical activity levels [4, 10, 13, 15, 16] we can infer text messages may be helpful. This is not to say that computer generated messages would be of no value, particularly if the model established in Sweet Talk is utilized. In this system the patients 'contract' personal diabetes self management goals with their health care provider and Sweet Talk schedules a series of appropriately tailored messages [6]. The notion of contracting could similarly be used with teenage girls, specifying goals for physical activity. In both scenarios there is a personal connection between the sender and the teen. This personal connection may have been the missing element in the system for bulimia recovery. Taylor and Harper have described the underlying significance of text message sending and receiving behavior of teenagers as ritualized gift giving [14]. It follows that receiving automated messages that are not at least indirectly tied to an important person in the teenager's social network may adversely affect the acceptance and uptake of such a system.

3.2 Positive, Personalized Message Content with Appropriate Context

Positive peer pressure from friends, loving support from family members, and goal directed messages from health care providers are just a few of the possible categories for message content. Positive messages should yield a positive response but what happens with a message that is perceived negatively? Grinter and Elderidge have found that teens sometimes have problems determining intent from the content of text message [7]. Thus, given the possibility of a misunderstood message, it may be better to utilize an automated text message delivery system with controlled content that has been developed and tested by health care professionals. Another option would be to provide these messages as list of ready-made text messages for cell phone use. Friends and family members are also in the best position to determine if the context of a message is correct due to their interpersonal relationship with the teen. A machine cannot make these types of decisions and thus is less able to give an uplifting message with perfect timing in the way a close friend or family member can.

4 Discussion

We are exploring how text messaging can help empower and motivate young women to be more physically active. There is evidence that automated text message systems can be an effective means to support behavior modification, but there have not been

any studies targeting physical activity. We are currently conducting a user study to compare the effects of computer-generated messages versus those sent by a real person in the girl's social support network on the uptake of physical activity. Informed by research about promoting physical activity in teenage girls [4, 10, 13, 15, 16] and social ecological theory [1], we are hypothesizing that text messages sent from friends and family will be more motivating than those sent automatically from a computer. However, a hybrid intervention may also provide an acceptable, cost effective and reliable intervention.

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