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Acceptability of Social Media Incentives to Increase Physical Activity

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ABSTRACT

Background: Contingency management can be effective in promoting physical activity, but the change frequently does not sustain after the intervention is withdrawn. A feasible and sustainable physical activity intervention is needed. Social media may meet the criteria for a sustainable intervention, as it is free to use and enormously popular.

Introduction: The goal of the current study was to assess acceptability of using social media as an incentive for a physical activity intervention.

Materials and Methods: The current study surveyed 102 Mechanical Turk users on their social media use, physical activity habits, and interest in a proposed physical activity intervention.

Results: There was moderate interest in social media as an incentive, with 32.35% of participants indicating initial interest in the intervention and 62.75% of participants interested in a free trial. Interest in increasing physical activity predicted interest in the intervention.

Discussion and Conclusions: Social media can be an acceptable incentive for use in a physical activity intervention.

Introduction

Centers for Disease Control (CDC) guidelines specify that U.S. adults ages 18-64 should engage in moderate intensity physical activity 150 minutes per week, and muscle strengthening twice a week.¹ Currently only about 1 in 5 of U.S. adults meet these recommendations.² Failing to meet CDC guidelines for physical activity is associated with increased risk of heart disease, stroke, and some cancers.² Because of the low rate of physical activity in the population and the substantial health consequences of inactivity, effective interventions designed to increase physical activity are needed.

One type of intervention that may promote physical activity is contingency management (CM). In CM, some material (often monetary) incentive is delivered contingent upon meeting a goal or engaging in specified behaviors. Conducting a CM intervention requires two things: (1) objective measurement of the target behaviors and (2) a means of delivering consequences based on the occurrence or non-occurrence of the target behaviors. CM has been shown to be effective in promoting drug abstinence across multiple drug classes,³ increasing medication adherence,⁴ and increasing physical activity.⁵

Contingency management interventions designed to increase physical activity typically have used either money or prizes as reinforcement for meeting step goals. For example, a study by Donlin Washington et al.⁶ used prize-based reinforcement to promote physical activity. Participants wore a Fitbit every day during the study. Participants were given a daily step goal during the intervention. Every day that they met or exceeded the goal, they were given the opportunity to draw from a prize bowl. Prizes ranged in value from \$5 to \$120. Eight out of the eleven participants increased their steps from baseline to intervention, but only one participant maintained the elevated physical activity after the intervention was withdrawn. In a similar experiment, Kurti and Dallery⁷ used monetary reinforcement to promote steps in sedentary adults. All six participants increased steps from baseline to intervention, but there were no follow-up data, so it is unknown whether this increase was maintained.

Though CM interventions have been successful in promoting physical activity, once the intervention is withdrawn, physical activity typically returns to near baseline levels. For example, in the study by Donlin Washington et al.,⁶ only one out of eight participants that increased physical activity maintained that increase during a follow-up period. The follow-up period could be considered entering extinction, in which they complete the target behavior, but the incentive is withheld. Eventually, the behavior stops occurring. A solution to this problem is finding a sustainable incentive. To be sustainable, an incentive must continue to have its effects on behavior over long time periods, and must be practical to use over long time periods. Practicality can be judged by a consideration of the ease

with which the incentive can be delivered immediately upon demonstration of the relevant behavior, along with the cost of the incentive itself. The most practical incentives are those that are very easy to deliver immediately and cost nothing.

Access to social media may meet the criteria for a sustainable incentive. Social media is free to use and is widely available. Social media is also enormously popular. Facebook is used by 79% of online adults, and 76% of Facebook users visit at least daily.⁸ Facebook is only one of several social media websites that are freely available. Given that social media is free, widely available, and incredibly popular, it is plausible that gaining access to social media is a sustainable incentive for increasing physical activity.

One study to date has used access to social media as a reward for engaging in physical activity. Larwin and Larwin⁹ developed a physical intervention for a 14-year-old girl who reported wanting to increase physical activity and lose weight. Her parents were used as a “coach”, making sure that she was adherent to the program and recording her data correctly. During baseline, she had free access to the treadmill and to internet and cellphone. During phase 1 of the study, the participant could earn one hour of non-school related internet time for walking one mile on the treadmill. During phase 2 of the study, the participant could earn 1.5 hours of phone and/or internet time for 1.5 miles of walking. Each additional half mile walked earned a half hour of phone (but not internet) time. The participant did not use the treadmill at all during the two-week baseline. The participant averaged .98 miles per day during phase one, and 1.8 miles per day during phase two. Although these results are promising, the intervention required considerable involvement of her parents. For this type of intervention to be effective for adult populations, technology is required to withhold reinforcement until the occurrence of the target behavior or outcome is verified. With current technology, it is feasible to create a social media incentive intervention program available via smartphones and computers.

While research using social media as an incentive for physical activity is limited, there have been several studies using access to television as a consequence for engaging in physical activity.¹⁰⁻¹² One study by Faith et al. investigated the effectiveness of contingent access to TV on physical activity in ten obese children.¹⁰ The investigators used a device called the “Contingent TV”, which consisted of a TV, an exercise bike, and a power controller. The Contingent TV could power the TV based on the rate of pedaling on the exercise bike, and measured RPM, duration of pedaling, and duration of TV watching. A Contingent TV was provided to each participant. The children were randomized either to the contingent TV group or the control group. The control group participants had free access to both the exercise bike and to the television. The contingent TV group had to pedal the bike at a specified rate in order to access the television at either a 1:1 or 1:2 ratio (one minute of pedaling equaled either one or two minutes of television watching). Time spent

pedaling increased for the experimental group from baseline to intervention, but decreased for the control group. The experimental group also lost significantly more body fat than the control group.

While feasible to create a social media incentive program for exercise, interest in such a program is unknown. Thus, the purpose of the present study was to assess the acceptability of incentive-based physical activity interventions, with a special focus on the use of access to social media as an incentive. This study was intended to guide the initial development of an intervention that makes access to social media contingent upon meeting a physical activity goal.

Method

Materials

A web-based survey was created to investigate opinions on the social media based physical activity intervention. The survey assessed social media use, workout habits, interest in increasing their physical activity, and demographics. Initial interest in the program was measured on a five-point rating scale anchored with *not at all interested* and *extremely interested*. Any participant who indicated that they were not interested or indifferent received a follow-up question regarding whether they would revise their opinion if the program had been clinically demonstrated to be effective. Those that did not revise their opinion were then given a follow-up question regarding reasons that they would not revise their opinion about the program, including that social media was too valuable or not valuable enough, the program was too complicated or hard to use, or that they do not trust the program is secure. A series of questions were asked about possible ways to increase their interest, such as telling them that it is no more complicated to operate than the typical application, includes a tutorial viewable at any time, and the ability to pick which social media websites were blocked as part of the program.

The next series of questions were designed to assess interest in the social media incentive program compared to other kinds of physical activity programs. A brief description was given for an array of programs including deposit contract, competition with friends, competition with anonymous players, goal setting, goal setting with public results (such as posting to Facebook), financial incentive program, and the social media incentive program. Given this list, participants were asked which of these they would consider trying to increase their physical activity level. Participants were then asked to rank order some of the approaches in terms of what they preferred and what they thought would be most effective.

Lastly, participants were asked about their preferences for specific features of the social media incentive program. For instance, participants were asked their

preference between having personalized goals or setting their own goals. The entire survey was designed to take about 15 minutes.

Procedure

Participants were recruited from Amazon Mechanical Turk© (MTurk). MTurk is an online labor market where “Requesters” (researchers or organizations requesting information) can post jobs for “Workers” (the employees). The jobs are called human intelligence tasks (“HITs”), and can be almost anything, including answering surveys, transcribing audio, conducting web searches, and comparing receipts. The survey for the current study was created using Qualtrics© and posted as a HIT on MTurk.

The survey was only visible to those that met inclusion criteria. Participants had to live in the United States, have at least a 95% acceptance rate on MTurk, and have completed at least 500 HITs on MTurk to qualify for this study. All data were collected within 48 hours of initial posting. Participants were paid \$2.75 for completing the survey.

Data Analysis

Data was analyzed using Minitab statistics software. Logistical regressions were used to predict interest in the social media incentive program. For the question, “how many hours per day do you typically spend on social media”, for any values over 24 it was assumed that they input minutes instead of hours. The values were changed to equivalent hour values (e.g., 60 changed to 1).

Results

Demographic data for all 102 participants are detailed in Table 1. Participants were primarily white, college educated, social media users in their late twenties to early thirties. 56.86% of participants were either overweight or obese, and 63.73% indicated an interest in increasing their physical activity levels.

Table 1
Participant Demographics

Variable	Categories	Sample (%)	
Gender	Man	61 (59.8)	
	Woman	41 (40.2)	
Age	18-24	14 (13.73)	
	25-34	56 (54.90)	
	35-44	21 (20.59)	
	45-54	7 (6.86)	
	55-64	2 (1.96)	
	65<	2 (1.96)	
Race/ethnicity	White	83 (81.37)	
	Black or African American	9 (8.82)	
	American Indian or Alaskan Native	1 (.98)	
	Asian	7 (6.86)	
	Native Hawaiian or Pacific Islander	1 (.98)	
	Hispanic	1 (.98)	
	BMI Category	Underweight	5 (4.90)
		Normal	39 (38.24)
Overweight		31 (30.39)	
Obese		27 (26.47)	
Education	Less than high school degree	1 (.98)	
	High school or equivalent	16 (15.69)	
	Some college	21 (20.59)	
	Associate Degree	15 (14.71)	
	Bachelor's Degree	44 (43.14)	
	Master's Degree	2 (1.96)	
	Doctorate Degree	1 (.98)	
	Professional Degree (JD, MD)	2 (1.96)	
Income	Less than \$10,000	2 (1.96)	
	\$10,000 – \$19,999	7 (6.86)	
	\$20,000 - \$29,999	13 (12.75)	
	\$30,000 - \$39,999	17 (16.67)	
	\$40,000 - \$49,999	19 (18.63)	
	\$50,000 - \$59,999	15 (14.71)	
	\$60,000 - \$69,999	7 (6.86)	
	\$70,000 - \$79,999	1 (.98)	
	\$80,000 – \$89,999	6 (5.88)	

	\$90,000 - \$99,999	7 (6.86)
	\$100,000 – \$149,999	7 (6.86)
	\$150,000 or more	1 (.98)
Survey Region	Midwest	23 (22.55)
	Northeast	20 (19.61)
	South	38 (37.25)
	West	20 (19.61)
	Missing	1 (.98)
Physical Activity	Light	78 (76.47)
	Moderate	72 (70.59)
	Intense	45 (44.12)
Social Media	Strength Building	36 (35.29)
	Facebook	81 (79.41)
	Twitter	60 (58.82)
	Snapchat	28 (27.45)
	Instagram	44 (43.14)
	Reddit	67 (65.69)
	Tumblr	15 (14.71)
	Pinterest	31 (30.39)
Youtube	5 (4.90)	

Interest in Intervention

Of the 102 participants, 33 (32.35%) indicated initial interest in a physical activity program that involved unlocking access to social media (see Figure 1). Of the 69 that were not initially interested, 28 (40.58%) indicated that they would revise their opinion of the program if it had been shown to be clinically effective. Reasons why they would not revise their opinion are shown in Figure 2. Other reasons included concern that it limited personal freedom, that they use social media for their job, they use messenger as a main source of communication, and that they already work out enough or their weight is not an issue. Participants also indicated the possibility of the program helping them increase engagement in physical activity and the ability to set their own goals as attractive features of the program (see Figure 3).

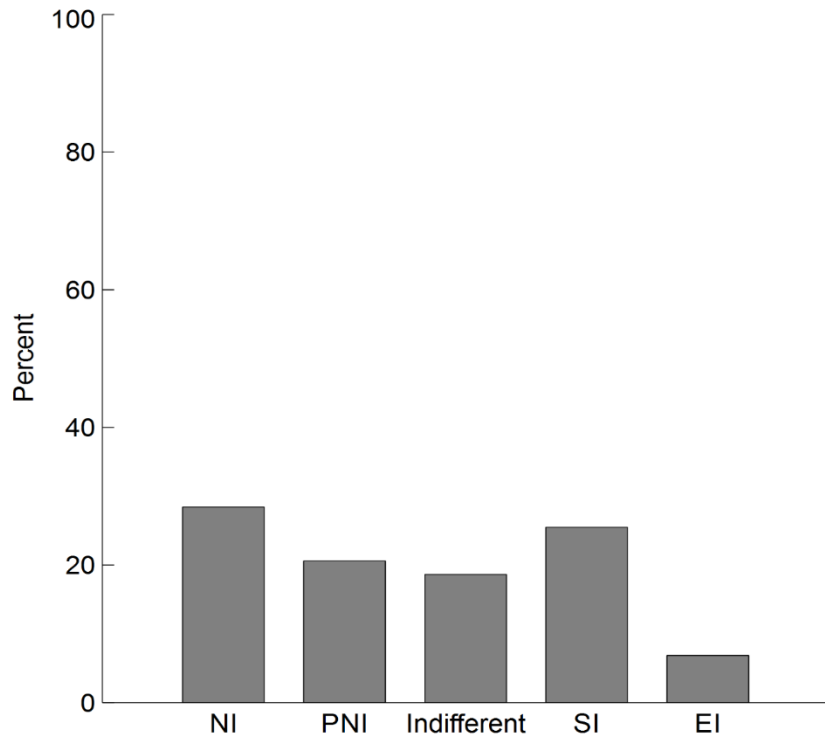


Figure 1. Percent of participants reporting initial interest in the social media incentive program. NI = Not interested, PNI = Probably not interested, SI = Somewhat interested, and EI = Extremely interested.

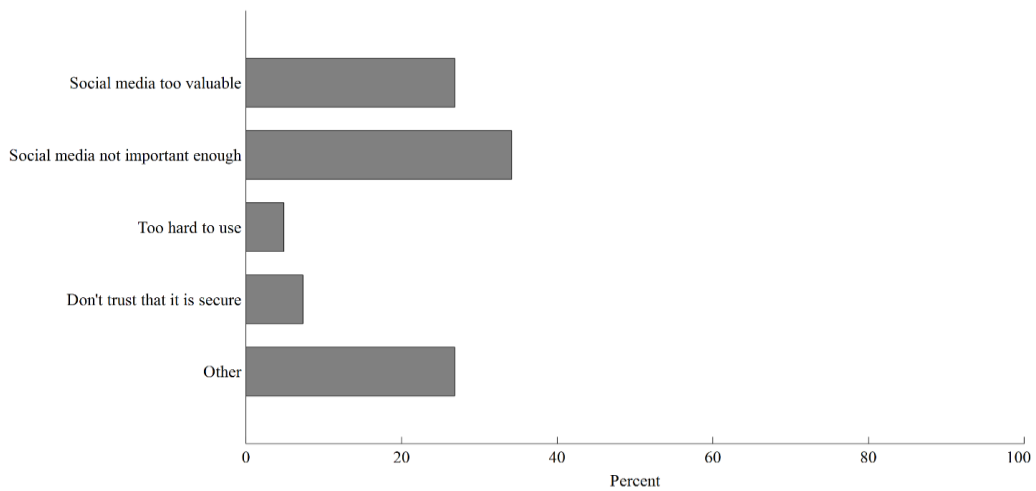


Figure 2. Percent of participants that chose given potential reasons for disinterest in the program after being told that it has been shown to be clinically effective.

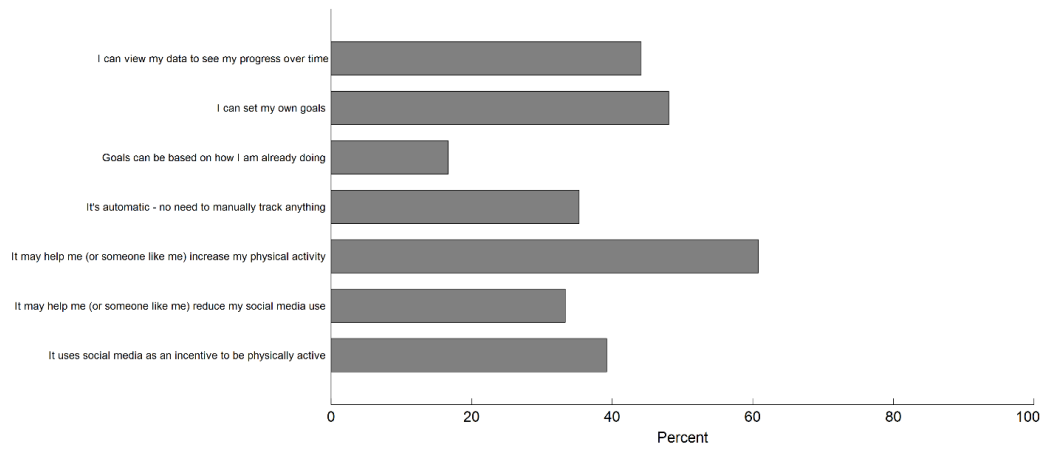


Figure 3. Percent of participants that chose given attractive features.

Over half (62.75%) of participants indicated that they were willing to try a free trial of the program. Figure 4 shows a survival curve for willingness to pay for the program. The median price that they were willing to pay was \$5.00.

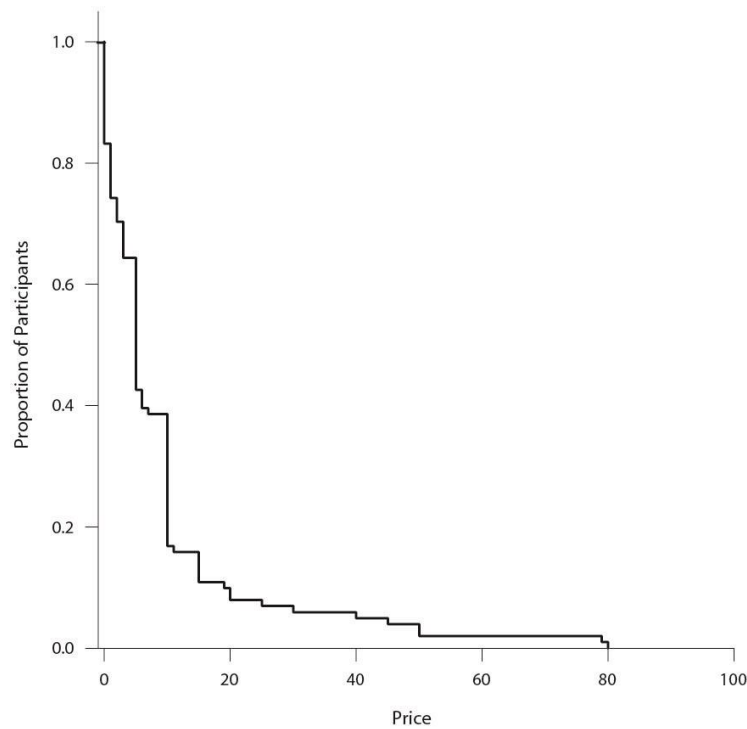


Figure 4. Survival curve for willingness to pay for the social media incentive program.

To identify potential predictors of interest in the social media incentive program, two logistical regressions were run, one to predict initial interest in the program (Yes/No) and one to predict interest in a free trial (Yes/No). Age, BMI, self-reported daily social media use, whether they engage in physical activity (Yes/No), and interest in increasing physical activity (Yes/No) were used as predictors. Interest in increasing physical activity was the only significant predictor for initial interest in the program, $\chi^2(1, N = 102) = 17.49, p < .001$. Those who were interested in increasing their physical activity were 10.16 times more likely to report initial interest in the social media incentive program than those who were not interested in increasing their physical activity. Interest in increasing physical activity was also the only significant predictor for interest in a free trial, $\chi^2(1, N = 102) = 17.46, p < .001$. Those who were interested in increasing their physical activity were 6.66 times more likely to be interested in a free trial than those who were not interested in increasing their physical activity.

Intervention and Incentive Preferences

Preferences for intervention types are shown in Figure 5. Monetary incentive was ranked highest as the most preferred physical activity intervention and the intervention perceived to be most effective. Competition with friends was ranked second, and social media incentive was ranked third for most preferred and fourth for most effective

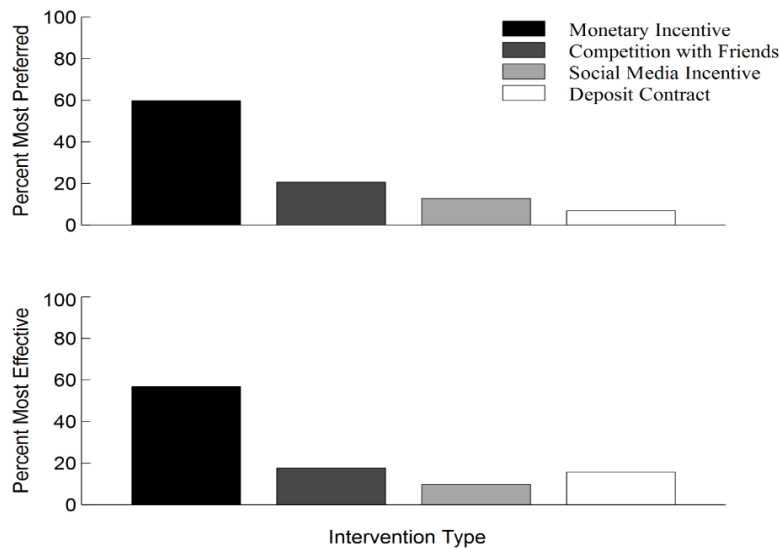


Figure 5. Percent of participants that ranked each intervention first. The top panel shows rankings for most preferred interventions. The bottom panel shows rankings for interventions that they thought would be most effective.

Preferences for potential program features are detailed in Table 2. There were clear preferences for being able to set goals for specific days of the week, being able to set own activity goals, and having social media as an incentive rather than donating to charity. When asked for additional attractive features to include, common responses were achievements or trophies, posting to social media, competition with friends, and earning money.

Table 2
Preference for Program Features

Variable	Categories	Sample (%)
Unlocking Timing	Unlock social media for rest of day after meeting activity goal	46 (45.10)
	Unlock social media for 24 hours after meeting activity goal	25 (24.51)
	Indifferent	31 (30.39)
Setting Goal Days	Set specific days that I need to meet my goal (such as Monday, Wednesday, and Friday)	67 (65.69)
	Set a number of days in a row that I need to meet my goal (such as the next three days)	17 (16.67)
	Indifferent	18 (17.65)
Setting Goals	Personalized goals given to me	26 (25.49)
	Set my own goals	57 (55.88)
	Indifferent	19 (18.63)
Preferred Consequence	Access to preferred websites, such as Facebook, Reddit, or Instagram, after meeting my activity goals	63 (61.76)
	Donate money to charity if I don't meet my activity goals	22 (21.57)
	Indifferent	17 (16.67)

Discussion

Approximately 30% of participants reported initial interest in the social media program and 63% reported willingness to try it. Interest in increasing physical activity was a significant predictor of interest in the social media incentive program. Taken together, these results indicate that the use of social media as an incentive for physical activity is highly acceptable among people who would have access to and need such an intervention.

Daily social media use was not predictive of interest in the program. This finding could be due to the sample including both those who find social media too valuable to risk as well as those who do not find social media valuable at all. Given that there is some interest in the program, it seems like there is a happy medium of people who use social media, find it valuable, but are also willing to risk it, although more research is needed.

A limitation of the current study was that there was a small sample of approximately 100 people. The sample size was chosen to reduce costs while maintaining an acceptable level of margin of error of 10%. Given that the purpose of the study was to investigate whether there was any interest in the proposed intervention, the margin of error, and thus the sample size, was deemed acceptable as long as over 1% of the participants showed interest. Another limitation was that the efficacy of using social media as an incentive to promote physical activity was not investigated in the current study. An interest in a physical activity program does not necessarily mean that it would be beneficial. The results of Larwin and Larwin (2008) indicate that social media can be used as an incentive to increase physical activity, but more research is certainly needed. Given the reasonable level of interest in this intervention, its development and clinical evaluation is warranted.

In summary, this study demonstrated that social media can be an acceptable incentive for use in a physical activity intervention. Even a low interest in the general population indicates a large pool of potential users. Interest in increasing physical activity predicts interest in the proposed intervention. More research is needed to determine the efficacy of using social media as an incentive to promote physical activity.

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