THE IMPACT OF IMPLEMENTATION INTENTIONS IN A WORKSITE PEDOMETER CHALLENGE

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ABSTRACT

The prevalence of sedentary lifestyles has led to progressively more unhealthy individuals, which contributes to an unproductive workforce. To address these issues and the related expenditures due to healthcare and lost productivity, workplace health promotion programs have acknowledged the capacity of various physical activity interventions including pedometer-based walking programs. Employing an implementation intention approach to these programs and delivering these planning messages through email has potential to strengthen health promotion programs. The purpose of this study is to determine the impact that email-delivered implementation intentions have on physical activity behaviors of participants in a worksite pedometer program. Fifty-six employees at American University who participated in a six-week pedometer challenge were part of a randomized controlled experiment in which intervention group participants received planning emails that featured implementation intentions over the course of the challenge as well as six-weeks post challenge. The results of the study demonstrated a significantly greater increase in walking among intervention group participants during the pedometer program. It was concluded that the use of implementation intention emails may increase adherence to walking in association with a worksite pedometer challenge and that health promotion practitioners should include this approach when designing programs to increase physical activity.

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CHAPTER 1

INTRODUCTION

Benefits of Physical Activity and Consequences of a Sedentary Lifestyle

The United States Department of Health and Human Services (DHHS) released its first-ever Physical Activity Guidelines for Americans in 2008 (U.S. Department of Health and Human Services, 2011). These guidelines recommend minimum durations of weekly aerobic exercise that promotes significant health benefits among Americans. For adults, recommendations include at least 150 minutes of moderate-intensity, or 75 minutes of vigorous-intensity aerobic activity, or an equal blend of both moderate- and vigorous-intensity exercise every week. To gain substantial benefits, it is recommended that this physical activity be spread throughout the week in bouts of at least 10 minutes at a time. The numerous benefits of physical activity include reduced risk of stroke, type 2 diabetes, some cancers, osteoporosis, depression, high blood pressure, and premature death. Furthermore, a compelling amount of research has demonstrated a link between physical inactivity and cardiovascular disease (Hamer et al., 2012; Blair et al., 1989), which is the leading cause of death in America (Centers for Disease Control and Prevention, 2012). Despite the abundance of research supporting engagement in physical activity, 80% of American adults still do not meet the recommended guidelines (U.S. Department of Health and Human Services, 2012a). In addition to the increasing prevalence of medical conditions related to this inactivity, the country is also confronted with overwhelming healthcare expenditures generated by these complications. In many cases, these costs become organizations' responsibility.

Worksite Health Promotion Interventions to Address Lost Productivity

Goetzel et al. (1998) found that employees classified as at high risk for poor health outcomes contributed to significantly higher expenditures than lower risk employees. These costs not only represent higher healthcare expenditures, but increased health risks also translate into higher costs related to diminished productivity in the workplace (Schultz & Edington, 2007). This lost productivity is often evaluated in terms of absenteeism, however, this concept only partially explains the costs associated with the diminished productivity. Presenteeism is the other factor that helps describe costs associated with lost productivity. In their review, Schultz and Edington (2007) define presenteeism as "decreased on-the-job performance due to the presence of health problems," (p. 549) which is typically measured as costs related to decreased work output, errors, and inability to meet company production standards. Corporations are beginning to understand the impact of costs in lost productivity, and some have assessed such expenditures. Schultz and Edington refer to the former Bank One corporation, which calculated that 84% of its productivity costs were explained by presenteeism (as cited in Hemp, 2004). Schultz and Edington (2007) acknowledge the importance of managing high-risk employees, and also emphasize the benefits of targeting low and moderate risk workers as well.

The evidence connecting health risks with healthcare expenditures as well as with costs in lost productivity compels some employers to address the issues by implementing health promotion interventions. Accordingly, the worksite has been identified as an effective setting for implementing health promotion programs (Mills, Kessler, Cooper & Sullivan, 2007). Since the majority of Americans spend a considerable amount of time at their jobs, such interventions can reach a large portion of the population and contribute to effective changes (Prodaniuk, Plotnikoff, Spence & Wilson, 2004). The necessity of worksite health interventions is also

highlighted in Healthy People 2020, the DHHS' national agenda for communicating health promotion goals. Objectives in this plan aim to "increase the proportion of worksites that offer an employee health promotion program to their employees" (U.S. Department of Health and Human Services, 2012b). Many workplaces have realized the potential for these programs and have begun implementing health promotion interventions into this setting.

Use of Pedometers in Physical Activity Programs

Of the various types of worksite wellness programs, physical activity interventions are among the many that have demonstrated success in this setting (Proper et al., 2003). In particular, researchers have observed that programs implementing the pedometer as a tool to increase physical activity have proven to be effective. A pedometer is a small, body-worn device that detects motion and counts number of steps walked (Tudor-Locke & Bassett, 2004). Siegel, Braekbill, and Heath (1995) stated that walking is the most commonly promoted form of physical activity and Rafferty, Reeves, McGee, and Pivarnik (2002) added that it is also the most common type of leisure time activity (as cited in Tudor-Locke & Lutes, 2009). Since pedometers provide immediate feedback, they allow for increased awareness of physical activity levels. In this way, pedometers can facilitate self-monitoring and behavior change, and thus have also been regarded as valuable goal-setting tools (Tudor-Locke & Lutes, 2009). Furthermore, these behaviors may continue in the long-term with regular pedometer use. Several studies promote the utility of the pedometer and support pedometer-based walking programs as an approach to address health behaviors and the negative effects of sedentary lifestyles (Tudor-Locke et al., 2004; Freak-Poli et al., 2011; Faghri et al., 2008).

E-Technology in Health Promotion Interventions

In addition to pedometers, many workplaces have also realized the potential for incorporating e-technology into health promotion programing. The current increase in worksite computer and Internet access provides a validation for the use of e-technology (Faghri et al., 2008). Seventy-seven million Americans report using a computer at the worksite, which corresponds to 55.5% of employed individuals (Bureau of Labor Statistics, 2005). Accessing the Internet or email was the most predominant activity among these users. Nearly 88% of Internet users report email as the most common online practice (National Telecommunications and Information Administration, 2004). Considering the prevalence of e-technology in the workplace and the corresponding supportive research evidence, messages delivered via email are capable of promoting healthy lifestyle changes. Specific studies have observed positive effects of Internet interventions that use behavioral email counseling (Tate, Jackvony & Wing, 2003) as well as email reminders (Dinger, Heesch, Cipriani & Qualls, 2006; Plotnikoff, McCargar, Wilson & Loucaides, 2005) to promote healthy behaviors such as improved nutrition and physical activity practices.

Implementation Intentions and Promoting Healthy Behavior Change

Internet-based interventions have also been applied to study goal-planning behaviors, and many focus specifically on improving various health-related behaviors (Sniehotta et al., 2007; de Nooijer, de Vet, Brug & de Vries, 2006; Skar, Sniehotta, Molloy, Prestwich & Araujo-Soares, 2011). Several of these interventions highlight implementation intentions as key to achieving goals. Implementation intentions are action plans that specify the when, where, and how an individual will achieve an intended goal-directed behavior (Gollwitzer 1993, 1999). Implementation intentions are described as a form of if-then planning, which connects situational

cues to behavioral responses in an effort to attain a goal. Research has demonstrated the positive impact of implementation intentions on changing health behaviors and achieving related goals (Milne, Orbell & Sheeran, 2002; Prestwich, Perugini & Hurling, 2009; Sheeran & Silverman, 2003; Gollwitzer & Oettingen, 1998). Moreover, these studies have identified the effectiveness of implementation intentions across various health behaviors and settings, including physical activity and the worksite. Several findings support the application of implementation intentions in promoting such healthy behavior changes and many health promotion interventions have demonstrated its potential.

Significance of the Study

As the prevalence of sedentary lifestyles and other poor health behaviors continue to expand, the nation is faced with progressively more unhealthy individuals. This translates to rising healthcare costs and an unproductive workforce. To address these concerning issues, workplace health promotion programs have acknowledged the capacity of various interventions including pedometer-based walking programs. Furthermore, employing an implementation intention approach and delivering such interventions through email has potential to strengthen health promotion programs. This study aims to build on the literature by combing all of these approaches in the workplace setting as well as by implementing multiple emails over the course of several weeks. Consequently, this study may provide insights to health promotion practitioners on increasing adherence to physical activity programs.

Purpose

The purpose of this study is to determine the impact that email-delivered implementation intentions have on physical activity behaviors of participants in a worksite pedometer challenge.

Specifically, this study used a sample of participants from the 2012 Steps to A*healthy*U Pedometer Challenge at American University (AU) to examine these effects.

Primary Hypothesis

1. Relative to the control group, participants in the intervention group will demonstrate greater physical activity levels during the Pedometer Challenge.

Secondary Hypotheses

2. In relation to the control group, intervention group participants will exhibit greater levels of physical activity six-weeks post Pedometer Challenge.

3. Compared to the control group, the intervention group will log steps for a greater number of weeks over the course of the Pedometer Challenge.

Definition of Terms

The following terms are used throughout this document.

Absenteeism: an employee's lack of physical presence at work.

A*healthy*U: American University's faculty and staff wellness program.

Body Mass Index (BMI): a height-to-weight ratio used as an indicator of body fatness to screen for weight categories that may result in health problems (Centers for Disease Control and Prevention, 2011).

Implementation intentions: action plans that specify the when, where, and how an individual will achieve an intended goal-directed behavior (Gollwitzer 1993, 1999).

Motivational Phase: first action phase for behavioral performance in which the individual weighs the pros and cons of performing the behavior; similar to the concept of intention (Milne, Orbell & Sheeran, 2002).

Physical Activity: "any bodily movement produced by skeletal muscles that requires energy expenditure" (World Health Organization, 2012).

Pedometers: small, body-worn devices that detect motion and count number of steps walked (Tudor-Locke & Bassett, 2004).

Presenteeism: "decreased on-the-job performance due to the presence of health problems" (Schultz and Edington, 2007, p. 549).

Protection Motivation Theory: a framework developed by Rogers (1983) that proposes we protect ourselves based on four factors, which include perceived severity of a threatening event, perceived vulnerability, efficacy of the recommended preventive behavior, and perceived self-efficacy.

Volitional Phase: the post-intentional phase for behavioral performance in which the individual develops strategies and plans in order to ensure behavioral enactment of the intention; similar to the concept of implementation intentions (Milne, Orbell & Sheeran, 2002).

Worksite: place of employment; also referred to as workplace.

Limitations

Participants self-selected to take part in the study, which creates a sample that may not be representative of the population. The majority of participants who volunteered for the study were female (82%), Caucasian (84%), and between the ages of 26 and 35 years old (48%). This lack of diversity in gender, race/ethnicity, and age in the study creates difficulty in generalizing results to a larger population. Additionally, participation track (either competition or challenge) status was unbalanced between control and intervention groups, which cause challenges in identifying the intervention treatment as the primary driver for intervention group participants' behavior. Another limitation to the study is that outcomes were based on self-reported data.

Although participants were instructed to answer survey questions honestly and thoroughly, it is possible that misinformation was provided.

Delimitations

Participants recruited were exclusively American University faculty and staff members. All participants were over the age of 18 years old. Additionally, participants were not required to reply to emails to confirm receipt and intervention group participants were not required to state their implementation intentions or report adherence to these plans.

Assumptions

It is assumed that participants were truthful in the answers they provided to survey questions. It is also assumed that the randomization tool evenly assigned participants into control and intervention groups.

CHAPTER 2

REVIEW OF LITERATURE

Overview

This chapter reviews literature on the impacts of physical inactivity and some of the strategies developed to overcome such negative effects. Among the strategies discussed, implementation intentions are highlighted along with worksite interventions, Internet-based programs, and pedometer programs.

Physical Activity

In the Healthy People objectives, the U.S. Department of Health and Human Services declares that more than 80% of American adults do not meet physical activity guidelines (U.S. Department of Health and Human Services, 2012a). To promote significant health benefits, these guidelines recommend that adults engage in minimum durations of weekly aerobic exercise. The minimum recommendations are at least 150 minutes of moderate-intensity, or 75 minutes of vigorous-intensity aerobic activity, or an equal blend of both moderate- and vigorous-intensity exercise. Physical activity should be spread over the course of the week and in minimum bouts of 10 minutes at a time (U.S. Department of Health and Human Services, 2011).

The guidelines state that some amount of physical activity is better than none, and highlight the many health benefits gained from being physically active. These benefits include reducing the risk of stroke, type 2 diabetes, some cancers, osteoporosis, depression, high blood pressure, and premature death (U.S. Department of Health and Human Services, 2012a). Additionally, research has demonstrated a causal association between physical inactivity and cardiovascular disease (Hamer et al., 2012; Blair et al., 1989), which is the leading cause of death among Americans (Center for Disease Control and Prevention, 2012).

In one particular study, Hamer et al. (2012) recruited 1429 participants diagnosed with cardiovascular disease. Participants' physical activity was measured along with risk markers such as body mass index, total-to-HDL cholesterol ratio, diagnosed diabetes, systolic blood pressure, resting heart rate, and C-reactive protein. Of the 446 deaths recorded during a 7-year follow-up, 213 were attributed to cardiovascular causes. The researchers observed that participants who engaged in moderate or vigorous physical activity at least three times per week demonstrated lower risk of cardiovascular disease death. These participants also exhibited lower levels of body mass index, diabetes, and C-reactive protein. These metabolic and inflammatory risk factors accounted for roughly 12.8% and 15.4%, respectively, of the physical activity and cardiovascular death correlation. While this study demonstrates the positive role of physical activity in reducing cardiovascular death among participants already diagnosed with the disease, other studies examine the preventive effects of exercise on healthy adults.

Blair et al. (1989) studied 13,344 healthy men and women who had no personal history of heart attack, hypertension, stroke, or diabetes at baseline. Researchers compiled data from the participants' recent medical examinations and performed a maximal treadmill test to determine participants' fitness categories. At an average 8-year follow-up, 283 deaths were reported. Health history, demographics, medical examination measures, and health habits were all adjusted before data analysis. The outcomes of the study demonstrate a strong correlation between physical activity and mortality due to all causes, cardiovascular disease, and cancer. Moreover, the findings suggest that a low level of physical activity is a significant risk factor for all-cause mortality among men and women. The researchers also note that higher levels of physical activity seem to slow the rate of all-cause mortality, which is mainly explained by the lower frequency of cardiovascular disease and cancer.

The health benefits of physical activity are clearly documented. Despite the abundance of supportive evidence, the majority of Americans still do not meet recommended physical activity guidelines (U.S. Department of Health and Human Services, 2012a). In addition to the health risks associated with inactivity, the country is also faced with overwhelming healthcare expenditures and costs associated with lost productivity, many of which are connected to sedentary lifestyles (Schultz & Edington, 2007). In many cases, these costs fall burden to employers.

Worksite Wellness

The worksite has been identified as an effective setting for implementing health promotion interventions (Mills, Kessler, Cooper & Sullivan, 2007). Since the majority of Americans spend a considerable amount of time at their jobs, interventions in this setting can reach a large portion of the population (Prodaniuk, Plotnikoff, Spence & Wilson, 2004). Many workplaces have realized the potential for health promotion programs and numerous studies have indicated the value of these interventions.

The effects of a sedentary lifestyle and other poor health behaviors contribute to rising healthcare expenditures. Goetzel et al. (1998) found that employees at high risk for poor health outcomes contributed to significantly higher expenditures than those classified at lower risk. Seven risk categories support this result: employees classified as depressed contributed to 70% higher expenditures, high stress (46%), high blood glucose levels (35%), extremely high or low body weight (21%), former and current tobacco users (20%, 14%), high blood pressure (12%), and sedentary lifestyle (10%) all contributed to this outcome. Furthermore, workers with multiple risk profiles for certain diseases were associated with higher expenditures. Heart

disease contributed to 228% higher expenditures, along with other conditions including psychosocial problems (147%), and stroke (85%) (Goetzel et al., 1998).

These costs not only represent higher healthcare expenditures, but increased health risks also translate into higher costs related to diminished productivity in the workplace (Schultz & Edington, 2007). This lost productivity is often evaluated in terms of absenteeism, however, this concept only partially explains the costs associated with the diminished productivity. Presenteeism is the other factor that helps describe costs associated with lost productivity. In their review, Schultz and Edington (2007) define presenteeism as "decreased on-the-job performance due to the presence of health problems," (p. 549) which is typically measured as costs related to decreased work output, errors, and inability to meet company production standards. Corporations are beginning to understand the impact of costs in lost productivity, and some have assessed such expenditures. Schultz and Edington refer to the former Bank One corporation, which calculated that 84% of its productivity costs were explained by presenteeism (as cited in Hemp, 2004). Schultz and Edington (2007) acknowledge the importance of managing high-risk employees, and also emphasize the benefits of targeting low and moderate risk workers as well.

Mills, Kessler, Cooper, and Sullivan (2007) stated, "a well-implemented multicomponent workplace health promotion program can produce sizeable positive changes in health risk status, absenteeism, and work performance in engaged individuals" (p. 51). In this 12-month study, participants completed pre and post health risk appraisals and work performance questionnaires. Respondents in the intervention group received personalized health reports that provided tailored information and recommendations on improving specific health-related behaviors. These participants received emails every two weeks and had access to an interactive online portal that

offered education and tips on self-improvement related to their specific health needs. Participants in the control group only completed the baseline and follow-up questionnaires, and did not receive any other feedback or information regarding their health status. Results of the study revealed significant improvements for all three measures in the intervention group. The intervention condition exhibited a .45 mean decrease in risk factors, a .36 decrease in monthly absenteeism days, and a .79 increase in work performance. Additionally, the intervention generated a positive return on investment. This study, along with a plethora of related research, supports the worksite as a setting for health promotion interventions.

Physical activity interventions are among the many programs that have been implemented in the worksite setting. In one review, Proper et al. (2003) analyzed the effectiveness of worksite physical activity programs. The researchers examined studies that involved randomized and nonrandomized controlled trials, a healthy working population, a worksite program that promoted employees' physical activity or physical fitness, and outcome measures of physical activity, physical fitness, or health. Based on analysis, the researchers concluded that worksite physical activity programs are effective in increasing physical activity levels and reducing the risk of musculoskeletal disorders (2003).

Pedometers

Pedometers are small, body-worn devices that detect motion and count number of steps walked. Researchers and practitioners have used pedometers to measure physical activity and encourage corresponding behaviors (Tudor-Locke & Bassett, 2004). The device gained popularity in Japan in the 1960s, when it was first marketed as *manpo-kei*, which translates as "ten thousand steps meter" (Hatano, 1993). This concept of 10,000 steps is recognized not only in Japan, but it has also gained acceptance in the U.S.

Accumulating 10,000 steps per day has been evaluated as a sound estimate of daily activity for healthy adults and corresponds to U.S. physical activity recommendations (Tudor-Locke & Bassett, 2004). An abundance of research also supports this step count goal and has correlated it with indicators of good health. Such studies have demonstrated that achieving at least 10,000 steps per day is associated with less body fat (Tudor-Locke et al., 2001; Hatano, 1993) and lower blood pressure (Hatano, 1993).

One particular intervention, the First Step Program, yielded substantial physical activity improvements among diabetic participants using pedometers (Tudor-Locke et al., 2004). The program addressed behavior modification through approaches based on principles of self-efficacy, social support, goal-setting, self-monitoring, and feedback. The participants used pedometers to determine baseline physical activity levels, demonstrate the typical number of steps taken in a given amount of time, and assist in goal-setting, self-monitoring, and feedback. In addition to physical activity assessments, anthropometric measurements, resting heart rate, blood pressure, oral glucose tolerance, and blood samples to determine insulin, haemoglobin A1c, and plasma lipid profiles were also taken. Participants in the intervention group were instructed to set step count goals and use their pedometers to monitor their daily steps over the 16-week study. Results of the study support the First Step Program as an intervention to significantly improve walking behavior among sedentary, overweight and obese adults with type II diabetes. From baseline, participants increased their daily steps by 3,000, which equates to roughly 30 minutes of additional walking per day. Physiological outcomes showed an inverse relationship between steps per day and blood glucose, HbA1c, and triglyceride concentrations among participants who were taking oral hypoglycemic medications. There was also an association between participation in the program and minor reductions in waist and hip girths.

The researchers note that although the physiological impact of increased walking were slight, the study supports the program as an initial step in promoting the adoption of a more physically active lifestyle. The authors also conclude that the present study supports "the utility of the pedometer approach with a population known to have little interest in, and high dropout rates from, formal exercise programs" (Tudor-Locke et al., 2004, p. 118).

A similar pedometer study was performed in a worksite setting. Freak-Poli and colleagues (2011) examined the effects of a four-month physical activity program on the reduction of risk factors for diabetes and cardiovascular disease among employees. The intervention was part of the Global Corporate Challenge event, which is an organization that administers worksite pedometer programs. In the program, participants form teams of seven and wear pedometers to self-monitor daily steps. Participants are assigned a goal of 10,000 steps per day and record these steps using an interactive website. The website also offers participants additional health communication materials, such as dietary information. Throughout the program, weekly encouragement messages are delivered via email and participants can compare their team ranking against the other teams. Behavioral, anthropometric, biomedial, and risk scores were measured at baseline and four-month follow-up. The researchers observed the employees participating in the program and noted several improvements upon completion of the intervention. These results included improvements in risk factors for diabetes and cardiovascular diseases, as well as observed improvements in meeting physical activity guidelines and fruit consumption guidelines. Decreased waist circumference, blood pressure, and sitting time were included in these results as well as improvements for meeting fruit and vegetable intake guidelines and eating less takeaway dinners. Since the program website provides dietary information, the researchers speculate that this may have encouraged fruit and vegetable intake

and thus explains the improvements in these areas. The primary objective of the present study, however, was not focused on dietary intake, therefore data collection in this area were limited. The authors concluded that participating in the pedometer-based intervention positively impacted behavioral and anthropometric risk factors for diabetes and cardiovascular disease. The researchers also supported the workplace as a setting for chronic disease prevention, noting that this setting can reach individuals across a range of demographics (Freak-Poli et al., 2011).

Further studies support the worksite as a setting for physical activity interventions, and some specifically document the effectiveness of implementing pedometer walking programs at this setting. In one such study, Faghri et al. (2008) examined the impact of a Transtheoretical Model of Behavior Change approach to increasing physical activity through a worksite pedometer walking program. The program also applied internet-based motivational messages to the intervention. Participants' pre and post health history and stage of behavior change questionnaires were completed, and measurements of weight, height, blood pressure, and BMI were collected for the 10-week program. Participants were instructed to attach their pedometers and record the number of steps taken and minutes walked during the time they arrived and left work each day. Weekly motivational messages were delivered to participants via email and postings on the program website. These emails encouraged participants to continue walking and also informed them on setting goals and overcoming barriers. The website also included additional materials such as walking routes and information on healthy living seminars available. Researchers recorded baseline steps per week as defined by the steps taken during the first week of the program and compared the number of steps on a weekly basis. The results showed a significant increase in both physical activity participation and in the number of steps taken per week compared to baseline data. Participants walked an average of nearly 5,000 steps during the

eight-hour workday and there was a 33% increase in participants who moved from the "not active" to "active" status. There was a significant reduction in blood pressure, and the researchers also noted that 40% of baseline hypertensive participants became normotensive at the conclusion of the program. One-third of the participants lost at least 0.5% of their body weight and an additional 23% maintained their weight. Finally, there were no significant outcomes between the weekly number of steps and the participants' stage of change. The researchers conclude that the baseline stage of change or level of physical activity did not predict steps taken during the program. The authors note that this may provide support for pedometer walking programs at the worksite setting, since the intervention demonstrated effectiveness for all people, regardless of participants' beginning stage of change and activity level. The study also supports the pedometer-based walking program as an approach to address the negative effects of sedentary lifestyles.

The interventions discussed vary on program structures including setting, length of program, Internet components, step goal assignment versus step goal choice, team versus individual structure, and team size. While various program structures exist among the studies, this research demonstrates the versatility of pedometer program designs. These programs also support the use of pedometers in promoting physical activity and improving health outcomes.

E-Technology and Health Behavior Change

The increase in computer and Internet access has been observed in households and worksites over the past several years (Faghri et al., 2008). Seventy-seven million Americans report using a computer at the worksite, which corresponds to 55.5% of employed individuals (Bureau of Labor Statistics, 2005). Accessing the Internet or email was the most predominant activity among these users. Nearly 88% of Internet users report email as the most common

online practice (National Telecommunications and Information Administration, 2004). Given its prevalence, e-technology in the worksite may provide a new means for health promotion interventions to help employees change unhealthy behaviors.

In particular, messages delivered via email can promote healthy lifestyle changes. Tate, Jackvony, and Wing (2003) explored the impact of email counseling in an Internet-based weight-loss program for overweight and obese adults at risk for type 2 diabetes. Ninety-two participants were split into either a basic Internet weight loss program or an Internet weight loss program that included behavioral e-counseling. Measurements of weight, waist circumference, and fasting blood glucose were collected at baseline and throughout the 12-month study. All participants attended an introductory session, which included a lesson on navigating the Internet program as well as general instruction on diet, exercise, and behavior change as it pertains to weight-control. Participants were also instructed to record their daily dietary and physical activity behaviors. The basic Internet program provided general weight loss tips and information, and all participants received weekly email reminders to review the information provided and submit their current weight. In addition to these procedures, individuals in the behavioral e-counseling group also communicated with a certified counselor. These participants emailed their daily and weekly behavior progress to the counselor, who then offered feedback, reinforcement, recommendations for change, answers to questions, and general support. The results demonstrated that participants in the behavioral e-counseling group lost significantly more weight and showed greater reductions in waist circumference than those who received no e-counseling. Additionally, the initial percent body weight lost in the e-counseling group was double that of the group without e-counseling. This study supports the application of Internet interventions that use behavioral counseling via email. The researchers note that this approach

has the ability to yield positive effects in weight loss and corresponding type 2 diabetes risk (Tate, Jackvony & Wing, 2003).

A related study that focused specifically on physical activity interventions used email delivery to promote walking among inactive women (Dinger, Heesch, Cipriani & Qualls, 2006). In this study, participants completed baseline physical activity and stage of change questionnaires. Participants were assigned to either a pedometer-only group or a pedometer-plus group. Both conditions were instructed to wear pedometers throughout the day and to log their daily steps during the six-week intervention. At the start of the second week, participants set daily step goals based on the first week's logged steps. Both groups were sent weekly email reminders to wear the pedometers and to submit their logs for the week. In addition to these emails, the pedometer-plus group received commercial brochures as well as supplementary emails that included strategies based on the Transtheoretical Model (TTM). Results showed that together, participants in both groups increased their weekly walking minutes and advanced at least one stage of change. Separately, however, the groups did not differ significantly in the post-intervention measures. The researchers remarked that although the study did not support the application of weekly emails employing TTM-based strategies, it did support the utility of pedometers, step count logs, goal setting, and email reminders among these participants (Dinger, Heesch, Cipriani & Qualls, 2006).

Email reminders to promote healthy behaviors have also been specifically tested in the workplace setting. Plotnikoff, McCargar, Wilson, and Loucaides (2005) examined a worksite email intervention that targeted physical activity and nutrition behavior among employees. Participants completed baseline and follow-up measures on physical activity and nutrition related knowledge, attitudes, and behaviors. Throughout the 12-week study, participants in the

intervention group received one weekly physical activity and nutrition email, while those in the control condition did not receive any messages. Participants in the intervention group reported improved self-efficacy, pros, cons, intentions, and behavior associated with physical activity as well as improvement in practicing healthy eating, balancing food intake with activity level, healthy cooking methods, and avoiding consumption of high-fat foods. The researchers conclude that email is an effective approach in promoting workplace nutrition and physical activity (Plotnikoff, McCargar, Wilson & Loucaides, 2005).

Internet-based interventions have also been applied to study goal-planning behaviors. In one study, researchers explored the role of an online planning intervention on increasing physical activity among university students (Skar, Sniehotta, Molloy, Prestwich & Araujo-Soares, 2011). Participants in the study completed baseline and follow-up questionnaires on self-reported physical activity and theory of planned behavior measures. Participants were assigned to a control group, Action Plans group (AP), Coping Plans group (CP), or a combined group (AP+CP). Action planning is part of a goal-attaining strategy that specifies the when, where, and how a behavior will be performed in order to achieve a goal. Coping plans apply strategies to handle situations that might interfere with achieving planned goals. At the end of an online questionnaire, participants in the AP group were instructed to create plans that addressed when, where, and how they plan to engage in physical activity in the following semester. Those in the CP group were asked to reflect on difficulties that might interfere with their physical activity and were instructed to plan how they will overcome these impediments. Participants in the AP+CP group received instructions to complete both AP and CP tasks. Results demonstrated that participation in a specific goal-planning group was not associated with increased physical activity. The researchers noted several limitations of the study however, including lack of

adherence in formulating plans, insufficiently engaging intervention materials, and participant confusion in the central purpose of the study (2011). Although this particular study does not support the use of online planning methods to promote physical activity among the university student population, other studies have observed effective outcomes of similar online interventions (Sniehotta et al., 2007; de Nooijer, de Vet, Brug & de Vries, 2006).

This research indicates how the evolving field of e-technology can impact health behaviors relating to physical activity and nutrition. Many of the interventions highlight the effectiveness of email reminders. This approach can be employed across various types of settings and interventions, including the workplace and pedometer programs.

Implementation Intentions

Peter Gollwitzer introduced the concept of implementation intentions and its relationship with goal attainment and behavior change. In describing implementation intentions, Gollwitzer first explains the role of goal intentions. Goal intentions identify specific behaviors to perform or outcomes to achieve, and assume the format of "I intend to reach x" (Gollwitzer, 1999). After setting goal intentions, individuals often experience a sense of commitment and motivation toward reaching the goal. This, however, is just the first phase of adopting a behavior and achieving a goal (Heckhausen & Gollwitzer, 1987). Goal intentions do not always translate into behavior change, and thus a gap exists between intention and action. To address this gap, Gollwitzer conceptualized the idea of implementation intentions. Implementation intentions are action plans that specify the when, where, and how an individual will achieve an intended goal-directed behavior (Gollwitzer 1993, 1996, 1999). Implementation intentions are described as a form of if-then planning, which connects situational cues to behavioral responses in an effort to attain a goal. These plans follow the format of "If situation Y is encountered, then I will initiate

behavior Z in order to reach goal X" (Gollwitzer & Sheeran, 2006). An abundance of research has demonstrated positive effects of implementation intentions on changing health behaviors and achieving related goals.

One particular study examines the role of implementation intentions and physical activity. In this study, Milne, Orbell, and Sheeran (2002) explored how implementation intentions influence exercise participation. The researchers first applied a motivational intervention to investigate how exercise intentions and behavior are impacted by Protection Motivation Theory (PMT) variables. These variables, which include perceived severity, perceived vulnerability, perceived self-efficacy, and response efficacy, relate to the previously described concepts of motivation and intention. The researchers also assessed the impact of supplementing this motivational intervention with an implementation intention intervention on adopting exercise behavior. This condition was referred to as the volitional intervention, which relates to the previously described implementation intention strategy. In the study, participants were assigned to the motivational intervention group, the motivational and volitional intervention group, or a control group. All participants completed baseline questionnaires that assessed exercise behavior patterns. In addition, the two intervention groups were instructed to read a brochure based on PMT variables that contained information on coronary heart disease and the benefits of exercise. Immediately following, participants were measured on PMT variables and intentions. One week later, participants reported their exercise behavior during the previous week, and completed a second set of PMT and intention measures. Also during this session, participants in the motivational and volitional intervention group were informed of the effectiveness of implementation intentions and were instructed to form plans that specified when and where they would exercise in the subsequent week. After another week, all participants

were measured on PMT variables, intention, and behavior. At this time, they also reported when and where they exercised, as well as reasons for not engaging in exercise if this was the case. Results demonstrated that PMT variables increased intentions to exercise, although subsequent exercise behaviors were not performed in both intervention groups. In the second assessment, the three groups did not differ on the number of exercise sessions; however, at the third assessment, the condition that received both the motivational and volitional intervention engaged in more exercise than either the motivational intervention only group or the control condition. The implementation intention intervention group also showed strong correspondence between the time and place specifications in their plans and when and where they actually exercised. In concordance with other supporting research, the authors of the present study conclude that "implementation intentions are powerful strategies for behavioural enactment" (p. 179).

Further studies support the use of implementation intentions, and several have observed positive effects in the workplace setting specifically. In one study, Sheeran and Silverman (2003) examined the effects that implementation intentions had on promoting employee attendance at a worksite health and safety training course. In the study, participants received a postal questionnaire one week before the scheduled training courses. Participants were randomly assigned to a motivational intervention, a volitional intervention, a combined motivational and volitional intervention, or a control group. The questionnaires included the six dates of the scheduled training courses, and also contained the varying intervention messages. The message presented in the motivational intervention questionnaire was formulated to strengthen participants' intentions to attend a health and safety training course. The volitional intervention message was meant to increase the likelihood that employees would attend a course. This message provided places for employees to write implementation intentions, specifying the when

and where for attending a training course. The combined condition received both messages, while the control group received neither. Based on course records, the outcomes showed that participants in the volitional and combined intervention groups were more likely to attend a training course compared to the motivational and control groups. These findings indicate that participants who developed implementation intentions were twice as likely to attend a course. The researchers noted a strong correspondence between the training courses specified in the participants' implementation intentions and the courses they actually attended (2003). The study provides support for the effectiveness of implementation intentions on promoting health behaviors in the workplace setting.

Further studies also support the utility of implementation intentions in achieving healthy behavior changes. Prestwich, Perugini, and Hurling (2009) studied whether text message reminders could strengthen the impact that implementation intentions have on exercise. Participants were allocated to the implementation intention condition, the SMS condition, the combined implementation intention plus SMS condition, the Protection Motivation Theory (PMT) control group, or a full control group. Exercise behavior was assessed at baseline and four-week follow-up. All conditions except the full control group were presented with a PMT message, which they read before completing PMT variable measures. Participants in the implementation intention group were provided with information on this concept and were then instructed to form their own plans. Participants in the SMS group were informed that they would receive messages reminding them to exercise. They were instructed to decide what they wanted the message to say, how many messages they wanted to receive, and the days and times they wanted to receive the messages. The combined implementation intention plus SMS group was instructed to complete both tasks, and were given the option of receiving messages that reminded

them of their plans. Roughly 59% of this group chose this option. The full control group was not presented with any additional material. The outcomes of the study demonstrated that a combined implementation intention and text message approach is more instrumental in promoting exercise than a control condition or either intervention separately. The researchers believe the effectiveness of the approach is in part due to increasing the accessibility of the environmental cue through the reminder, associating the environmental cue and behavioral outcome by reminding an individual to implement the plan, or both. The authors conclude that plan reminders are an effective approach to strengthen the effectiveness of implementation intentions for physical activity.

These studies illustrate the value that implementation intentions have on behavior change. Implementation intentions have been successfully applied to improve physical activity among various populations and settings including the worksite. The research also demonstrates the utility of implementation intentions in conjunction with e-technology. Plan reminders delivered through e-technology have demonstrated the ability to strengthen the effectiveness of implementation intentions for physical activity.

Summary

Physical inactivity is a serious issue in America. Health risks associated with a sedentary lifestyle are numerous and have proven negative effects both in terms of disease and economic impact. Fortunately, researchers and practitioners continue to develop promising approaches for managing this burden, including pedometer programs and Internet-based interventions. Further studies incorporate implementation intentions, which have demonstrated measurable impact on behavior change. Research also identifies the worksite as an appropriate setting to implement such types of interventions. Combining these program designs and strategies can enable strong

effects for preventing and overcoming the negative consequences of an unhealthy lifestyle. The current study attempts to build on these concepts through integrating implementation intention messages delivered via email to facilitate physical activity in a worksite pedometer program. The study will advance the literature base by investigating the use of multiple email messages over a 12-week period and examining the lasting effects.

CHAPTER 3

METHODOLOGY

Overview

This chapter will discuss the methodology for the current study, including a description of the sample, study design, independent and dependent measures, study procedure, and data analysis.

2012 Steps to A*healthy*U Pedometer Challenge

The 2012 Steps to A*healthy*U Pedometer Challenge is a six-week program promoting physical activity among American University employees. The Pedometer Challenge is one of many health interventions presented by A*healthy*U, American University's Faculty and Staff Wellness Program. All full- and part-time AU faculty and staff members were invited to participate in this free program through postings in the University's electronic newsletter, bulletin boards, and email postcards. Faculty and staff members interested in participating completed an online registration form located on A*healthy*U's website. Participants were required to form teams of four to six individuals, including one designated team captain. If individuals had not organized a team, they indicated that they were a "free agent" on the registration form and A*healthy*U assigned them to a team.

The registration form included general demographic questions and contact information such as name, employment status, email address, and campus phone number. See Appendix A for the complete registration form. At registration, participants were also asked for their personal step goal. Each participant chose a personal daily step goal and typed the desired number into the space provided. As a guide to help participants choose a goal, a statement was presented that read: "It is recommended that healthy adults should strive to accumulate 10,000 footsteps a day

(or the equivalent of 5 miles). The average adult takes about 5,000 footsteps per day, and sedentary adults take about 3,000 footsteps per day."

Each team had the option to participate in either the Competition Track or the Challenge Track, and noted their choice on the registration form. Teams participating in the Competition Track competed against other teams in the Competition Track to be the top stepping group. Teams were ranked based on the average step total per team member over the course of the entire six-week Pedometer Challenge. All members from the top three stepping teams were awarded prizes, including Nike SportBands, iPod Shuffles, and heart rate monitors.

Teams in the Challenge Track participated in a non-competitive manner and were challenged to beat their own team goal. Team goals were calculated as the sum of each team members' daily step goal that was submitted during registration. All members whose team met or exceeded their team goal received their choice of an A*healthy*U yoga mat, A*healthy*U athletic wicking t-shirt, or CoolMax walking socks. Participants in both the Competition and Challenge Tracks earned individual prizes for meeting or exceeding their personal daily step goal established at registration, regardless of their overall team performance.

During the Pedometer Challenge, faculty and staff members wore their Elite Walk4Life Pedometer given to them by A*healthy*U and recorded the number of steps they accumulated over the course of the day. The intention was that participants would increase their number of steps through various forms of physical activity. A*healthy*U offered fitness opportunities to faculty and staff members during the week to encourage additional participation in physical activity. These activities were free of charge for faculty and staff members, and included group walks, run club, and yoga. Although A*healthy*U encouraged different types of physical activity, the

program acknowledged that pedometers are most accurate in counting steps for ambulatory movements.

Each week, team members sent their weekly step totals to their team captains, who then submitted step totals for the entire team to A*healthy*U using an online form. A*healthy*U compiled this data in a Microsoft Excel workbook. Team captains were required to submit their team step totals every Tuesday by 6:00 pm. On the following Wednesday, A*healthy*U staff members sent weekly team standing emails to all participants. For the Competition Track participants, the email included rankings of the top five teams. Challenge Track participants received emails informing them of their team step average for the week and whether they were above or below their predetermined team goal. Both Competition and Challenge Track emails included information on the fitness opportunities available for faculty and staff members. See Appendix B for sample of "Team Standing" emails.

Intervention

In addition to the weekly "team standing" emails, participants in the experimental condition received additional weekly "planning" emails. These planning emails were delivered using the A*healthy*U account and signed by the graduate assistant, who is also the primary investigator of the current study. These emails were sent every other week during the six-week Pedometer Challenge, and continued every other week for an additional six weeks after the Challenge concluded. Thus, three planning emails were sent during the Pedometer Challenge, and three were sent after the Challenge ended for a total of six planning emails. These emails were personalized for each participant by using the Mail Merge feature in Microsoft Outlook. The three emails sent during the Pedometer Challenge were customized to include each participant's name, weekly step goal, and whether the participant met, exceeded, or was slightly

under the weekly goal. Weekly goals were determined by multiplying the participants predetermined daily step goal by the number of days in the week. The three emails sent after the Challenge ended were customized to only include each participant's name.

Each email incorporated a different theme and included various facts, tips, and ideas related to walking. For example, one email informed intervention participants that lack of time is the top excuse for not exercising. The email continued to describe tips for accumulating more steps throughout the day, such as marching in place while watching television and using a restroom on a different floor at home or work. Themes of other planning emails coincided with current circumstances such as holidays and weather. These topics included social support, addressing busy schedules, and calories to steps conversions for popular Fourth of July foods.

Each planning email also included a guide intended to facilitate participants to plan their walking for the week. These guides were based off of Gollwitzer's concept of implementation intentions, which are action plans that specify the when, where, and how an individual will achieve an intended goal-directed behavior. Participants were offered the opportunity to tailor the guides by filling in the blank spaces of the templates with their own plans. Each of the guides contained the elements of implementation intentions to facilitate participants to plan the day/s, time/s, places/s, and how they will accomplish their walking for the week. The templates also incorporated components from the facts, tips, and ideas portion of each email in an effort to keep participants engaged in reading and using the guides. Examples of tailored guides were presented below the templates to demonstrate how participants were to use the guides. See Appendix C for samples of the planning emails.

Measures

Independent Variables

The independent measure of the study was the planning emails sent to the intervention group every other week during the six-week Pedometer Challenge and six-weeks post Pedometer Challenge. These emails were intended to facilitate intervention group participants to plan their physical activity. The control group did not receive these emails.

Dependent Variables

There were two dependent variables in the current study. The first dependent variable was participants' self-reported physical activity for before, during, and after the Pedometer Challenge, which was collected in the 6-Week and 12-Week Surveys. The second dependent variable was participants' total number of weeks logged during the Pedometer Challenge. This information was obtained from the A*healthy*U Pedometer Challenge spreadsheets, and was used to compare the total number of weeks that control and intervention group participants logged steps over the course of the Challenge.

Sample

Roughly 2,400 full- and part-time faculty and staff members are employed at American University. Four hundred ninety-one of these employees registered for the 2012 Steps to A*healthy*U Pedometer Challenge, which began on May 29. By May 24, 225 employees had registered for the Challenge and were invited to participate in the current study via email. This recruitment email was sent over a ten-day period by the Health Promotion Manager at A*healthy*U. The email briefly explained the opportunity and informed employees that study participants would receive an A*healthy*U moisture-wicking t-shirt. Pedometer Challenge

registrants who were interested in participating in the study were instructed to respond to the email by a specific deadline. Refer to Appendix D for a sample recruitment email.

Of the 225 Pedometer Challenge registrants who received the recruitment email, 86 volunteered to partake in the study. By the end of the study, three subjects resigned. One participant terminated employment at the university, one withdrew from the Pedometer Challenge, and another chose to drop out of the study. One of these participants who resigned had been randomly assigned to the intervention group and the other two were part of the control group. This left a total of 83 participants who completed the Pedometer Challenge registration form and volunteered for the study. Of the 83 participants, 71 completed the 6-Week Survey, 64 participants completed the 12-Week Survey, and 56 participants completed both of the surveys. See Table 1 below for breakdown of employment status of American University employees, Pedometer Challenge participants, and control and intervention group participants. See Table 2 below for breakdown of control and intervention group participants in each of the survey categories. Since the research hypotheses seek to examine questions that were included in both of the surveys, the statistical analyses will focus on the 56 participants who completed both the 6-Week and the 12-Week surveys.

Table 1
AU Faculty and Staff, Participation in Pedometer Challenge and Study

Participants	Faculty	Staff
AU Employees	800	1600
Pedometer Challenge Participants	47	444
Control Group Participants	6	35
Intervention Group Participants	5	37

Note. Survey responses of "Student Worker" and "Other" were categorized as "Staff"

Table 2
Participants and Surveys Completed

Condition	Completed Registration Form		Completed 6-Week Survey		Completed 12-Week Survey		Completed 6- and 12-Week Surveys	
	#	%	#	%	#	%	#	%
Control	41	49%	38	54%	32	50%	30	54%
Intervention	42	51%	33	46%	32	50%	26	46%
Total	83	100%	71	86%	64	77%	56	67%

The majority of the 56 research participants were female. There was no significant difference in gender distribution between control and intervention groups. See Table 3 below for a complete gender breakdown of control and intervention group participants.

Table 3
Breakdown of Gender

Gender	Control		Intervention		Total	
	#	%	#	%	#	%
Male	5	17%	5	19%	10	18%
Female	25	83%	21	81%	46	82%

The majority of participants were between 26 and 35 years old. There was no significant difference in age group distribution between control and intervention groups. See Table 4 below for the breakdown of control and intervention group participants in each age group.

Table 4
Breakdown of Age Groups

Age Group	Control		Intervention		Total	
	#	%	#	%	#	%
18 – 25	4	13%	3	12%	7	13%
26 – 35	14	47%	13	50%	27	48%
36 – 45	10	33%	5	19%	15	27%

Age Group	Control		Intervention		Total	
46 – 55	0	0%	4	15%	4	7%
56 – 65	2	7%	1	4%	3	5%
66+	0	0%	0	0%	0	0%

The majority of participants were White, Non-Hispanic. There was no significant difference in the distribution of race/ethnicity between the two conditions. See Table 5 below for the breakdown of control and intervention group participants by race/ethnicity.

Table 5
Breakdown of Race/Ethnicity

Race/Ethnicity	Control		Intervention		Total	
	#	%	#	%	#	%
White, Non-Hispanic	25	83%	22	85%	47	84%
Black or African American	0	0%	0	0%	0	0%
Hispanic or Latino	0	0%	0	0%	0	0%
Asian	3	10%	1	4%	4	7%
Native Hawaiian or Other Pacific Islander	0	0%	0	0%	0	0%
American Indian or Alaska Native	0	0%	0	0%	0	0%
Other	2	7%	3	11%	5	9%

As previously described, Pedometer Challenge registrants had the choice of participating in either the Challenge Track (non-competitive) or the Competition Track. An independent samples t-test found that there was a significant difference between the control and intervention groups regarding participation track. See Table 6 below for the complete breakdown of participants by participation track status.

Surveys

For the purpose of this study, two surveys were developed to investigate the effect that planning emails, which incorporated elements of implementation intentions, had on participants' physical activity during and after the 2012 Steps to A*healthy*U Pedometer Challenge. Surveys

administered to the control and intervention groups consisted of the same core content, but were tailored to the appropriate condition. The first survey was administered upon conclusion of the six-week Pedometer Challenge (6-Week Survey) and the second survey was administered six weeks after the Challenge ended (12-Week Survey). These online surveys were created using www.limeservice.com. The registration form developed by A*healthy*U for the Pedometer Challenge served as an additional questionnaire, and was administered to all individuals interested in registering for the Pedometer Challenge. For samples of all surveys, refer to Appendix E.

Table 6
Breakdown of Participation Track

Participation Track	Control		Intervention		Total	
	#	%	#	%	#	%
Challenge	17	57%	6	23%	23	41%
Competition	13	43%	20	77%	33	59%

6-Week Survey

The 6-Week Survey consisted of eight categories: Demographics, General Pedometer Challenge, Emails, Content of Emails, Team Participation, Motivation, Physical Activity, and Concluding Remarks. The first section gathered basic demographic information, such as gender, age, and employment status. The next set of questions related to the Pedometer Challenge, and asked which participation track individuals chose, if they served as a team captain, if they could recall their personal daily step goal, and if so, what this number was.

The Email section asked both control and intervention group participants how often they received and read the team standing emails, and reasons for not reading them if this applied. The

intervention group was presented an additional set of questions in this section pertaining to the planning emails. This additional set of questions in the Email section was in the same format as the team standing email questions. The questions in this section employed conditional logic, which allowed questions and answer choices to appear based on the user's response to previous questions.

The Content of Emails category also used conditional logic for those who read at least one of the planning emails. This section only appeared in the intervention group surveys, and asked these participants questions relating to the degree that the planning emails were relevant, useful, kept their attention, and the degree to which the planning guides were helpful. Participants responded to answers using a five-point scale relating to the question. In this section, intervention group participants were also asked how many of the guides they tailored and in what way/s they used the planning emails. At the end of this section, these respondents were given the opportunity to use free text to explain any additional positive or negative impressions of the planning emails.

Both the control and intervention groups responded to questions in the Team Participation category. These questions asked participants the amount they communicated with and walked with their teammates during the Pedometer Challenge, as well as the amount their team contributed to their motivation during the Challenge. Answer choices were organized in days per week. At the end of this section, participants were provided space for free text to explain how their team may have either positively or negatively influenced their participation in the Pedometer Challenge.

The Motivation section of the 6-Week survey asked participants about the extent that setting a personal daily goal impacted their motivation during the Pedometer Challenge as well

as the extent that logging their steps impacted their motivation during the Challenge. A five-point scale was used for the answer choices for these questions. Participants were also given the opportunity to explain any barriers or obstacles that hindered their participation in the Pedometer Challenge as well as any triumphs or milestones that occurred during their participation in the Challenge.

In the Physical Activity section of the 6-Week Survey, both groups were asked to indicate how often they participated in various activities before the Pedometer Challenge and during the Pedometer Challenge. These activities included walking, jogging/running, biking, swimming, elliptical, resistance training, and yoga. Participants were provided with three extra spaces to include additional activities that were not listed and how often they participated in them before and during the Challenge. Answer choices were organized by activity and days per week in an array by column.

The concluding section allowed participants to use free text to provide additional comments about their experience in the Pedometer Challenge.

12-Week Survey

The 12-Week Survey consisted of seven categories: Introduction, Emails, Content of Emails, Team Communication, Motivation, Physical Activity, and Conclusion. In both the 6-Week Survey and the 12-Week Survey, a space was included for participants to enter a unique identifying code. These codes consisted of the first two letters of the participants' first name, the first two letters of the participants' last name, followed by the last two digits of their birth year. Participants were instructed to enter their identifying codes in the first question under the first category of both surveys, and it was intended that individuals would enter their same unique codes on both surveys.

In the 12-Week Survey, the Emails and Content of Emails sections only appeared in the intervention group surveys. The questions under these categories were similar to those in the 6-Week Survey, but the questions strictly pertained to the planning emails.

In the Team Communication category, questions were similar to those in the 6-Week Survey, but participants answered questions based on "since the Pedometer Challenge ended." The Motivation category in the 12-Week Survey was also similar to that in the 6-Week Survey. These questions gathered information about participants' current habits in using pedometers and logging their steps.

The Physical Activity category in the 12-Week Survey presented the same activities that appeared in the 6-Week Survey. In the 12-Week Survey, however, participants were asked to indicate how often they participate in the activities since the Pedometer Challenge ended, instead of before and during the Pedometer Challenge. This allowed for the collection of information on physical activity behaviors after the Challenge was over.

The final section of the 12-Week Survey offered participants with the opportunity to provide additional comments pertaining to the emails, communication, motivation, or physical activity in general since the Pedometer Challenge ended. Participants were also asked to indicate their race/ethnicity in this section.

Design

This was a randomized controlled experimental research study that attempted to investigate the effect in which emails incorporating elements of implementation intentions had on participants' adherence to physical activity during and after a worksite pedometer challenge.

Procedure

The following section will explain the step-by-step process of implementing the intervention. This includes procedures prior to data collection, recruitment of participants, intervention implementation, and data compilation.

Prior to Data Collection

The current study received approval from the American University Institution Review Board (IRB) on May 3, 2012. The following events occurred before approval:

- February 5, 2010: The "Social and Behavioral Responsible Conduct of Research" Collaborative Institutional Training Initiative (CITI) ethics training course was completed
- May 1, 2012: The IRB Application for Approval to use Human Participants in Research was submitted to the AU Institutional Review Board (IRB), along with the appropriate attachments and Internet in Research Supplemental Form D
- May 2, 2012: The IRB requested revisions, and these modifications were submitted on the same day
- May 3, 2012: The IRB approved the submitted protocol and granted permission to begin the research

Recruitment

A total of 491 university employees registered for the 2012 Steps to A*healthy*U Pedometer Challenge, which began on May 29. By May 24, 225 employees had completed the online registration form for the Challenge and were invited to participate in the current study via email. The recruitment email was sent over a ten-day period by the Health Promotion Manager at A*healthy*U. The email briefly explained the opportunity and informed employees that study

participants would receive an A*healthy*U moisture-wicking t-shirt. Pedometer Challenge registrants who were interested in participating in the study were instructed to respond to the email by a specific deadline. See Appendix D for the recruitment email.

Informed Consent

Of the 225 Pedometer Challenge registrants who received the recruitment email, 86 volunteered to partake in the study. These participants were provided with a copy of the informed consent, which was sent by email or hand-delivered. The participants reviewed the document and communicated their consent to participate in the research study by signing the form. Participants also reviewed and signed the American University Release, Waiver of Liability and Assumption of Risk for Participation in 2012 AhealthyU Programs. Participants returned the forms to the investigator either by email, fax, or campus mail. Refer to Appendix F and Appendix G for copies of these forms.

Assignment to Groups

Using an online randomization tool, participants were randomly assigned to either a control or intervention group. A list of recruited study participants was compiled in a Microsoft Excel sheet. The random-number generator assigned participants a number, which corresponded with either the control or intervention group. Forty-three participants were randomly assigned to the control group, and another 43 participants were randomly assigned to the intervention group.

Intervention Emails and Surveys

Planning emails were sent to intervention group participants using the Mail Merge feature in Microsoft Outlook. The three planning emails that were sent during the 6-week Pedometer Challenge were delivered every other Wednesday afternoon, succeeding the general team

standing emails that were sent to all Pedometer Challenge participants. Shortly after the Challenge ended, all study participants were emailed an invitation to complete the 6-Week Survey. See Appendix H for a sample survey invitation. Surveys administered to the control and intervention groups consisted of the same core content, but were tailored to the appropriate condition. Links to the surveys were included in each participant's invitation email. Participants were given two weeks to complete the 6-Week Survey, and reminder emails were sent one week after the initial invitation. Refer to Appendix I for a sample survey reminder email.

The fourth planning email was sent to intervention group participants shortly after the Pedometer Challenge ended. These planning emails continued to be delivered every other Wednesday afternoon for six weeks. Soon after the final planning email was sent, all study participants were invited via email to complete the 12-Week Survey. Similar procedures to the 6-Week Survey were followed for the 12-Week Survey. Upon conclusion of the 12-Week Survey completion period, all study participants were compensated with A*healthy*U moisture-wicking T-shirts as stated. T-shirts were delivered via campus mail. See Table 7 below for a timeline indicating delivery of emails and surveys.

Table 7
Timeline of Emails and Surveys Sent

Date	Item Sent
5/29 – 7/9	Team Standing Emails; Planning Emails 1, 2, & 3
7/12	6-Week Survey Invitation
7/19	6-Week Survey Reminder
8/1	Planning Email 5
8/15	Planning Email 6
8/29	12-Week Survey Reminder

Note. Team Standing emails were sent every Wednesday from 5/29 to 7/9. Planning Emails were sent on 6/6, 6/20, and 6/27. All items were sent in 2012.

Data Compilation

After the survey period ended, responses to both the 6-Week Survey and 12-Week Survey were exported to Microsoft Excel. Separate Excel workbooks were arranged by control and intervention group and by 6-Week and 12-Week surveys. Responses were then sorted using the column that contained participants' unique identifying codes. These codes consisted of the first two letters of the participants' first name, the first two letters of the participants' last name, followed by the last two digits of their birth year. Duplicate identifying codes occurred, in which case the row containing the second appearance was deleted. Rows that contained incomplete responses were also deleted.

Participants who completed both the 6-Week Survey and the 12-Week Survey were established using the identifying codes. Similar yet not identical codes were reevaluated to determine if the user mistyped his or her identifying code in one of the surveys. A confidential list of participants' full names was referred to in order to verify and coordinate codes of participants who completed both surveys. The responses of these participants were compiled into a subsequent Excel sheet. An answer code sheet was developed for survey question responses and these codes were applied to the Excel sheets in order to prepare data for analysis in SPSS.

To address the third hypothesis relating to the number of weeks logged during the Challenge, data was obtained from the A*healthy*U Pedometer Challenge spreadsheets. Information in these Microsoft Excel sheets included data on total weeks logged for all Pedometer Challenge participants. Research study participants (n = 56) were extracted from this list to create separate Microsoft Excel sheets for control and intervention group participants using this data.

Data Analysis

Data analyses were performed using SPSS, and a p-value of less than or equal to 0.05 was considered significant for all tests. Analyses were performed using only the sample of participants who completed both surveys (n = 56), since the hypotheses refer to items included in both the 6-Week and 12-Week Surveys. Furthermore, since the Pedometer Challenge is a program that promotes walking, analyses were primarily focused on the activity of walking.

An independent samples t-test was performed to compare the difference between control (n = 30) and intervention (n = 26) groups' in the number of days individuals participated in various activities before, during, and after the Pedometer Challenge. Activities analyzed from the surveys included walking, jogging, biking, swimming, elliptical, resistance training, and yoga.

Using responses from the 6-Week and 12-Week surveys, an independent samples t-test was used to compare the difference between control (n = 30) and intervention (n = 26) groups' changes in activity levels over several time frames of the Pedometer Challenge. These time frames included: before the Pedometer Challenge, during the Pedometer Challenge, and after the Pedometer Challenge. Using the activities previously mentioned, the t-tests measured the change in activity levels over the different time frames. For each activity, data on activity levels of a specific time frame was subtracted from that of another time frame. Therefore, for each activity, changes in activity level were measured for "during from before" the Pedometer Challenge, "during from after" the Pedometer Challenge, and "after from before" the Pedometer Challenge.

An independent samples t-test was also used to compare control (n = 30) and intervention (n = 26) group participants' total number of weeks that they logged steps during the Challenge. Additional descriptive analyses were performed for variables including gender, age, race/ethnicity, participation track, planning emails read, and how planning emails were used.

CHAPTER 4

RESULTS AND DISCUSSION

Overview

This chapter reviews the results of the data analysis as it relates to the three hypotheses of the study. A discussion of the research findings and possible explanations of the results follows.

Results

The primary hypothesis of the study stated that relative to the control group, participants in the intervention group would demonstrate greater levels of participation in physical activity *during* the Pedometer Challenge, as indicated by the 6-Week Survey responses. To test this hypothesis, an independent samples t-test was used to compare participants' engagement in several types of physical activity during the Pedometer Challenge. The types of physical activity examined in the 6-Week Survey included walking, jogging/running, biking, swimming, elliptical, resistance training, and yoga. As previously noted, participants in the Pedometer Challenge were encouraged to engage in different types of physical activity, however, the program acknowledged that pedometers are most accurate in counting steps for ambulatory movements. Because of this, the planning emails referred to the activity of walking, and analyses focused on this activity as well. The independent samples t-test comparing the mean scores of walking during the Pedometer Challenge (Walking_During) resulted in a higher mean in the intervention group (m = 4.65, sd = .892) compared to the mean of the control group (m = 4.20, sd = 1.297), however this difference was not significant at the .05 level. Additional data on participants' walking levels *before* the Pedometer Challenge were also collected in the 6-Week Survey. The outcomes of an independent samples t-test comparing the mean scores of walking *before* the Pedometer Challenge (Walking_Before) resulted in a higher mean in the control group

(m = 3.73, sd = 1.660) relative to the intervention group (m = 3.31, sd = 1.594), however these results were also not significant at the .05 level. See Table 8 and 9 below for mean and standard deviation of this information.

Table 8
Independent Samples T-Test for Walking_During Between Control Group and Intervention Group

Condition	n	Mean	Standard Deviation
Control	30	4.20	1.297
Intervention	26	4.65	.892

Note. Survey responses were coded such that 1 represents walking 0 days per week, 2 represents walking 1 – 2 days per week, 3 represents walking 3 days per week, 4 represents walking 4 days per week, and 5 represents walking 5 – 7 days per week

Table 9
Independent Samples T-Test for Walking_Before Between Control Group and Intervention Group

Condition	n	Mean	Standard Deviation
Control	30	3.73	1.660
Intervention	26	3.31	1.594

Note. Survey responses were coded such that 1 represents walking 0 days per week, 2 represents walking 1 – 2 days per week, 3 represents walking 3 days per week, 4 represents walking 4 days per week, and 5 represents walking 5 – 7 days per week

To further investigate this data, an independent samples t-test was used to compare participants' changes in activity levels over several time frames relating to the Pedometer Challenge. The 6-Week and 12-Week surveys contained questions regarding activity level of various activities (e.g. walking, swimming, etc.) across each of the different time frames. These time frames included: before the Pedometer Challenge ("before"), during the Pedometer Challenge ("during"), and after the Pedometer Challenge ("after"). The t-tests measured the *change* in activity levels, thus, for each activity, data on activity levels of a specific time period

was subtracted from that of another time period. Therefore, for each activity, changes in activity level were measured for "during from before" ("db") the Pedometer Challenge, "during from after" ("da") the Pedometer Challenge, and "after from before" ("ab") the Pedometer Challenge. Results of these tests demonstrated a significant difference in activity levels of walking for "during from before" (change_walking_db) between the control and intervention groups. The mean of the intervention group was significantly higher at the .05 level of significance (m = 1.3462, sd = 1.41258) compared to the mean of the control group (m = .4667, sd = .73030) for this variable. Although not a direct support for the primary hypothesis, these results provide evidence that the intervention treatment may have impacted participants' levels of physical activity during the Pedometer Challenge. See Table 10 for data on this variable.

Table 10
Independent Samples T-Test for change_walking_db Between Control Group and Intervention Group

Condition	n	Mean	Standard Deviation
Control	30	.4667	.73030
Intervention	26	1.3462	1.41258

The second hypothesis of the study stated that in relation to the control group, the intervention group participants would exhibit higher levels of physical activity after the Pedometer Challenge concluded. An independent samples t-test was performed to investigate this hypothesis. Just as the t-test that compared participants' engagement in walking *during* the Pedometer Challenge, this test compared the means for walking between the control and intervention groups *after* the Pedometer Challenge ended (Walking_After). Results showed a higher mean in the intervention group (m = 4.65, sd = .892) compared to the control group (m = 4.20, sd = 1.297) for Walking_After, however this difference was not significant at the .05 level

and therefore did not support the second hypothesis. See Table 11 below for this data.

Table 11
Independent Samples T-Test for Walking_After Between Control Group and Intervention Group

Condition	n	Mean	Standard Deviation
Control	30	3.50	1.432
Intervention	26	3.69	1.379

Note. Survey responses were coded such that 1 represents walking 0 days per week, 2 represents walking 1 – 2 days per week, 3 represents walking 3 days per week, 4 represents walking 4 days per week, and 5 represents walking 5 – 7 days per week

As previously described, *changes* in activity level were measured for "during from before" ("db") the Pedometer Challenge, "during from after" ("da") the Pedometer Challenge, and "after from before" ("ab") the Pedometer Challenge. Although not statistically significant at the .05 level, changes in walking for "during from after" ("da") the Pedometer Challenge and "after from before" ("ab") the Pedometer Challenge resulted in higher means for the intervention group compared to the control group. See Table 12 and Table 13 below for this data.

Table 12
Independent Samples T-Test for change_walking_da Between Control Group and Intervention Group

Condition	n	Mean	Standard Deviation
Control	30	.7000	1.17884
Intervention	26	.9615	1.66086

Table 13
Independent Samples T-Test for change_walking_ab Between Control Group and Intervention Group

Condition	n	Mean	Standard Deviation
Control	30	-.2333	1.25075
Intervention	26	.3846	1.76809

In the 6-Week and 12-Week surveys, data was collected on the number of planning emails that intervention group participants reported reading. For the 6-Week Survey 80% of participants read at least 2 of the 3 emails during the Pedometer Challenge, while only 20% read less than 2 emails. Similarly, for the 12-Week Survey, the majority of participants also reported reading at least 2 of the 3 emails *after* the Pedometer Challenge. See Tables 14 – 17 below for a complete breakdown as well as means and standard deviations of this data.

Table 14
Planning Emails Read by Intervention Group During the Pedometer Challenge

Number of Planning Emails Read	Number	Percent
0 emails	3	12%
1 emails	2	8%
2 emails	4	15%
3 emails	17	65%

Note. Percentages were rounded to the nearest whole number

Table 15
Mean and Standard Deviation of Planning Emails Read by Intervention Group During Pedometer Challenge

n	Mean	Standard Deviation
26	2.346	1.056

Note. A total of 3 planning emails were sent during the Pedometer Challenge

Table 16
Planning Emails Read by Intervention Group After Pedometer Challenge Ended

Number of Planning Emails Read	Number	Percent
0 emails	3	12%
1 emails	2	8%
2 emails	2	8%
3 emails	19	73%

Note. Percentages were rounded to the nearest whole number

Table 17
Mean and Standard Deviation of Planning Emails Read by Intervention Group After Pedometer Challenge Ended

n	Mean	Standard Deviation
26	2.423	1.0648

Note. A total of 3 planning emails were sent after the Pedometer Challenge ended

The 6-Week and 12-Week surveys also gathered data on how intervention group participants used the planning emails over the course of the Pedometer Challenge. The majority of participants reported using the emails as a reminder to walk both during and after the Challenge. See Table 18 and Table 19 below for a complete breakdown of this data.

Table 18
Utilization of Planning Emails During Pedometer Challenge

Utilization	Number	Percent
Did Not Use	6	23%
Plan Walking	4	15%
Reminder to Walk	12	46%
Motivation to Walk	9	35%

Note. Participants could choose multiple responses for this survey question.

Table 19
Utilization of Planning Emails After Pedometer Challenge Ended

Utilization	Number	Percent
Did Not Use	8	31%
Plan Walking	2	8%
Reminder to Walk	15	58%
Motivation to Walk	7	27%

Note. Participants could choose multiple responses for this survey question

An independent samples t-test was performed to analyze the impact that using the planning emails as reminders to walk had on actual walking levels. For both the 6-Week and 12-Week surveys, results showed that those who used the emails as reminders exhibited higher levels of walking before and after the Pedometer Challenge. These results, however, were not significant at the .05 level. See Table 20 and Table 21 below for this data.

Table 20
Emails Used as Reminders to Walk During the Pedometer Challenge

Used Emails as Reminders	Mean	Standard Deviation
Yes	4.917	.2887
No	4.429	1.1579

Table 21
Emails Used as Reminders to Walk After the Pedometer Challenge

Used Emails as Reminders	Mean	Standard Deviation
Yes	3.933	1.2799
No	3.364	1.5015

The third hypothesis stated that the intervention group (n = 26) would have a higher number of total weeks logged during the six-week Pedometer Challenge as compared to the control group (n = 30). An independent samples t-test indicated that there was no significant difference at the .05 level between the control (m = 6, sd = .0000) and intervention (m = 5.962, sd = .1961) groups for this variable. Therefore, this hypothesis was not supported. See Table 22 below for means and standard deviations of this data.

Table 22
Independent Samples T-Test for Weeks_Logged Between Control Group and Intervention Group

Condition	n	Mean	Standard Deviation
Control	30	6.000	.0000
Intervention	26	5.962	.1961

Discussion

The three hypotheses of this study focused on how planning emails, which applied concepts of implementation intentions, can influence adherence to physical activity in a worksite pedometer program. Since walking is the primary activity promoted in the Pedometer Challenge, language used in the planning emails referred to walking, and thus analyses focused on this type of activity as well.

The primary hypothesis of the study proposed that relative to the control group, intervention group participants would demonstrate greater levels of physical activity, defined as more steps in their daily walking, during the Pedometer Challenge. The primary hypothesis was not directly supported, due to a lack of statistically significant results. The second hypothesis proposed that intervention group participants would exhibit greater levels of physical activity, defined as more steps in their daily walking, post Pedometer Challenge. This hypothesis was not supported. The third hypothesis was also not supported, indicating that there was not a significant difference in the number of weeks that control and intervention group participants logged steps during the Challenge. The remainder of this chapter will discuss possible explanations for these results as well as limitations to the study and emerging evidence to the trend.

Physical Activity During the Pedometer Challenge

The primary hypothesis proposed that compared to the control group, participants in the intervention group would exhibit higher levels of physical activity *during* the Pedometer Challenge. As previously explained, the analyses focused on the activity of walking. Results indicated that the *intervention* group demonstrated a greater amount of walking *during* the Pedometer Challenge as compared to the control group, however these results were not statistically significant. Further investigations found that *before* the Pedometer Challenge, *control* group participants demonstrated a slightly greater amount of walking compared to the intervention group, however these results were also not significant. Even though these results lack significance, it indicates that the intervention group began the Pedometer Challenge with slightly lower levels of walking, but surpassed the control group during the Challenge, when intervention treatment was administered. This data was used to evaluate participants' *changes* in activity levels from before the Pedometer Challenge to during the Challenge. Outcomes were statistically significant, indicating that the intervention group who received implementation intention treatment exhibited a greater change in walking levels from before the Pedometer Challenge to during the Challenge compared to the control group. These results provide evidence that the intervention treatment may have impacted participants' levels of physical activity during the Pedometer Challenge. It is observed that the standard deviation of this outcome is slightly higher than the mean. Because of this variability, the mean is not stable. Upon reflection, this outcome is likely due to the grouping of days in the answer choices such as 5 – 7 days. To correct for this, the answer choices should not be grouped, but rather broken down into individual days.

The foundation of the primary hypothesis was based on previous research that determined a correlation exists between the use of implementation intentions and behavior change (Prestwich, Perugini & Hurling, 2009; Sheeran & Silverman, 2003; Milne, Orbell & Sheeran, 2002; Gollwitzer & Oettingen, 1998). Peter Gollwitzer introduced the concept of implementation intentions and its relationship with goal attainment and behavior change. Implementation intentions are action plans that specify the when, where, and how an individual will achieve an intended goal-directed behavior (Gollwitzer 1993, 1996, 1999). Implementation intentions are described as a form of if-then planning, which connects situational cues to behavioral responses in an effort to attain a goal. These plans follow the format of "If situation Y is encountered, then I will initiate behavior Z in order to reach goal X" (Gollwitzer & Sheeran, 2006). Research has demonstrated positive effects of implementation intentions on changing health behaviors like physical activity participation and achieving related goals (Prestwich, Perugini & Hurling, 2009; Sheeran & Silverman, 2003; Milne, Orbell & Sheeran, 2002; Gollwitzer & Oettingen, 1998).

This current study examines the influence of implementation intentions on increasing physical activity, which researchers Milne, Orbell, and Sheeran (2002) similarly explored. Their study included a motivational intervention group, a motivational and volitional intervention group, and a control group. Both intervention groups received treatment meant to increase their motivation and intention to exercise. Additionally, the motivational and volitional intervention group was instructed to form plans that specified when and where they would exercise during the upcoming week (implementation intentions). Results showed that the group receiving implementation intention treatment engaged in more exercise than the other two conditions. Additionally, results from this group showed a strong correspondence between the time and

places specified in the action plans and when and where the participants exercised. The research of Milne, Orbell, and Sheeran provides evidence that implementation intentions are effective strategies for influencing behavior. Specifically, this research supports the use of implementation intentions to increase participation in physical activity and provides further support that implementation intentions likely impacted the intervention group's walking behavior.

In addition to using implementation intentions to influence physical activity participation, the current study also incorporated e-technology in the form of email messages. A similar approach by Prestwich, Perugini, and Hurling (2009) applied text messaging rather than emails to study whether these messages could strengthen the impact that implementation intentions have on exercise. The study included an implementation intention condition, an SMS condition, a combined implementation intention plus SMS condition, a Protection Motivation Theory (PMT) control group, and a full control group. All conditions except the full control group read a motivational messaged based on the Protection Motivation Theory. Participants in the implementation intention group were provided with information on this concept and were instructed to form their own plans. Participants in the SMS group were informed that they would receive messages reminding them to exercise and were instructed to decide what they wanted the message to say, how many messages they wanted to receive, and the days and times they wanted to receive the messages. The combined implementation intention plus SMS group was instructed to complete both tasks, and were given the option of receiving messages that reminded them of their plans. Roughly 59% of this group chose this option. The results showed that the combined implementation intention and text message approach was the most effective in promoting

exercise. The researchers concluded that plan reminders are an effective approach to strengthen the effectiveness of implementation intentions for physical activity.

In the current study, data was collected on how participants used the planning emails during and after the Pedometer Challenge. The majority of these participants reported using the emails as reminders to walk. This indicates that the emails worked in a similar manner as the messages used in the work of Prestwich, Perugini, and Hurling, by reminding intervention group participants to implement their walking plans. This therefore increased the likelihood that they would follow through with their intentions, which assisted in greater increases in walking during the Pedometer Challenge compared to the control group. These findings provide support that the implementation intention emails impacted participants' walking levels during the Pedometer Challenge.

It is possible that other elements of the emails influenced participants' walking levels. During the Challenge, planning emails stated the participants' individual cumulative steps for that week along with their *weekly* goal, which was calculated by multiplying the individual's personal goal by the number of days in the week. Control group participants received the team standing emails, which were sent to all participants in the Pedometer Challenge. Individuals participating in the Competition Track received team-standing emails that included rankings of the teams participating in this Track. Challenge Track participants received team-standing emails that stated their *team's* cumulative weekly steps along with their *team* goal. Differences in the numbers that were referenced may have impacted motivation and walking behavior. Intervention group participants were provided individual reports, while control group participants in the Challenge Track received reports that combined the team's current steps and goal of their team. Receiving this individual feedback may have impacted intervention group

participants' motivation and walking behavior. Furthermore, intervention group participants received emails that stated their *weekly* goal, whereas this information was not presented to control group participants. Presented with their weekly goal, intervention group participants may have reflected on the bigger picture of the week as a whole, which possibly could have affected their subsequent walking behaviors and motivation. Therefore, it is possible that the intervention group's greater increases in walking was not just attributed to the implementation intentions, but also to these numbers referenced in the planning emails.

In summary, it is important to consider the factors that may have contributed to the results, including the presentation of goals in the emails. Moreover, research connecting implementation intentions and increasing physical activity participation is convincing and supports the implication that participants' walking levels during the Pedometer Challenge were likely impacted by the implementation intentions. These studies have demonstrated that when individuals create specific action plans for physical activity, they are more likely to adhere to their plans and achieve their goals. Finally, incorporating e-technology can function as a reminder to individuals to complete these plans, further increasing the likelihood of following through with intentions. All in all, it is likely that the implementation intentions contributed to the intervention group's greater increases in walking during the Pedometer Challenge.

Physical Activity After the Pedometer Challenge

The second hypothesis of the study stated that compared to the control group, intervention group participants would exhibit higher levels of physical activity *after* the Pedometer Challenge ended. During this six-week period, three additional planning emails were sent to intervention group participants. The second hypothesis was not supported due to a lack of significant results. Similar to the primary hypothesis, it was believed that individuals

receiving implementation intention treatment through email messages would be more likely to adhere to their walking plans and exhibit higher levels of physical activity even after the Pedometer Challenge concluded. This was based on previous research that supported the effectiveness of implementation intentions as strategies for behavior change, and the use of e-technology as plan reminders to strengthen these action plans (Sheeran & Silverman, 2003; Milne, Orbell & Sheeran, 2002; Gollwitzer & Oettingen, 1998; Prestwich, Perugini & Hurling, 2009). The following section attempts to explain the lack of support for this hypothesis.

Firstly, these outcomes convey that the Pedometer Challenge itself likely affected participants' motivation and adherence to physical activity. The Pedometer Challenge consisted of several components, which required that participants were members of a team, set a goal, wore a pedometer, and logged and reported steps. Participants also had the opportunity to win prizes at the conclusion of the Challenge. Some, if not all, of these components may have contributed to participants' motivation and adherence to physical activity during the Pedometer Challenge. After the Pedometer Challenge ended, these requirements were no longer enforced, which may help explain the lack of support for the secondary hypothesis.

Alternatively, the plausible support that the planning emails impacted participants' walking levels during the Pedometer Challenge indicates that these implementation intention messages likely contributed to the intervention group's greater adherence to physical activity as well. This indicates that the planning emails may have served as a supplement to the pedometer program to further improve participants' physical activity levels. The lack of support for the second hypothesis demonstrates that perhaps the two systems work best together to provide an outcome greater than each of the methods could have provided independently.

Other explanations may help in understanding the lack of support for the second hypothesis. To begin with, it may be possible that participants had less time to walk and were less motivated during the months in which planning emails were sent *after* the Pedometer Challenge. These took place during the later months of the summer, closer to the start of the new semester. Planning emails sent *during* the Pedometer Challenge were in the beginning months of summer, when faculty and staff members may have had less work. It was also presumably less humid and hot during these months compared to later in the season, which may have also impacted walking behaviors. Given these circumstances, the timing of the post Pedometer Challenge planning emails may help to further explain the lack of support for the second hypothesis.

Additionally, planning emails sent after the Pedometer Challenge ended no longer stated participants' self-determined step goals and if they were meeting these goals. Since the Pedometer Challenge had concluded, participants were no longer required to wear pedometers and submit steps, therefore it was impossible to inform participants about their performance and how it related to their goals. It is likely that setting a goal and being reminded of it impacts participants' motivation to walk, whether as part of a pedometer program or not. Furthermore, receiving feedback on whether this goal is being attained may also influence motivation. These speculations may also aid in further explaining the lack of support for the second hypothesis.

Steps Logged

The third hypothesis, which proposed that compared to the control group, the intervention group would log steps for a greater number of weeks over the course of the Pedometer Challenge, was not supported. It was believed that participants who received the planning emails were more likely to stay engaged in the pedometer program and report higher levels of physical

activity as a result. This belief emerged from the previously discussed research on implementation intentions. Prior studies demonstrated a correlation between individuals receiving implementation intention treatment and increased physical activity participation (Milne, Orbell & Sheeran, 2002; Prestwich, Perugini & Hurling, 2009). In the current study, it was believed that those who received the implementation intention treatment were more likely to participate in higher levels of physical activity compared to those without the treatment. Therefore, the higher levels of physical activity would indicate that these individuals were more engaged in the pedometer program and more likely to follow the protocol of logging their steps.

The lack of support for this hypothesis may be in part due to the nature of the research participants. All subjects volunteered to participate in the study. By self-selecting, these individuals were likely already engaged in the program and conceivably more motivated to complete the entire six-week Challenge than those who did not volunteer for the study.

Limitations

Further limitations may have influenced the results of the study. Firstly, the majority of participants were female, Caucasian, and between the ages of 26 and 35 years old. This lack of diversity in gender, race/ethnicity, and age in this study creates difficulty in generalizing results to a larger population.

In addition to unequal proportions of demographic variables, participation track status was also unbalanced between control and intervention groups. Individuals who registered for the Pedometer Challenge chose to participate in either the Competition Track or the Challenge Track. Individuals on teams participating in the Competition Track competed against other teams in this track to be the top stepping group. Teams in the Challenge Track participated in a non-competitive manner and were challenged to beat their own team goal. Participants in both

tracks were eligible to win prizes, though the prizes awarded to the top three stepping teams in the Competition Track were more costly than those awarded to qualified Challenge Track participants.

In the current study, there was a statistically significant difference in team composition regarding participation status, with more Competition Track participants in the intervention group than in the control group. It is recognized that individuals participating in the Competition Track are by nature, more competitive and highly motivated to be in the top stepping group than those in the Challenge Track. Additionally, there were higher stakes for members of top teams in the Competition Track. Therefore, it is postulated that Competition Track participants were more likely to exhibit greater levels of physical activity during the pedometer program in order to achieve this ranking. The greater proportion of Competition Track participants in the intervention group may have contributed to the higher levels of physical activity exhibited by this group. This may help explain why the intervention group demonstrated a greater change in walking levels from before the Pedometer Challenge to during the Challenge compared to the control group, and may indicate that this increase in walking was not only attributed to the implementation intentions.

Another limitation to the study is that outcomes were based on self-reported data. Although participants were instructed to answer survey questions honestly and thoroughly, it is possible that misinformation was provided. Using self-report instruments is a simple and flexible method for assessing physical activity, although its validity is considered mediocre compared to objective measures (Matthews, 2002). Because of this, researchers should take caution in analyzing and generalizing results of self-reported data. Thus, the outcomes of the current study may be weaker due to this type of data.

The survey responses to physical activity questions may also be flawed for additional reasons. Questions regarding participants' physical activity levels *before* the Pedometer Challenge appeared in the 6-Week Survey, which was administered at the end of the Challenge. Therefore participants had to recall their activity levels at least six weeks prior from when they were responding to these survey questions. Recalling activity levels from six weeks earlier may result in distorted reporting, which leads to inaccurate data. In addition to responses identifying behavior from *before* the Pedometer Challenge, questions inquiring about activity levels *during* the Pedometer Challenge may have also lead to flawed data. The 6-Week Survey also instructed participants to recall how often they participated in various activities *during* the Pedometer Challenge. The Challenge was six weeks long, and therefore participants may have differed on which part of the Pedometer Challenge they recalled to answer this question. Those who responded to this question based on their activity level toward the beginning of the Challenge may provide different answers compared to if they had responded based on their activity level toward the middle or end of the program. A similar issue may have occurred in the 12-Week Survey when participants were asked about their activity levels *after* the Pedometer Challenge. Participants again may have differed on which part of the six-week period after the Challenge they recalled to answer these questions.

A final limitation to the current study is the use of self-selection sampling. This type of sampling was a suitable approach since the American University employee population is relatively sensitive and private in disclosing health-related information. Allowing participants to volunteer for the study helped to avoid any individual discomfort surrounding this issue. Using self-selection sampling was also beneficial, since these individuals were likely more committed to the study and willing to provide personal insights. This method, however, creates a sample

that may not be representative of the population (Utts & Heckard, 2007). It is possible that those who volunteered for the study are more naturally motivated individuals. This may have affected the outcomes of the study and may help explain results, specifically those associated with the lack of support for the third hypothesis.

Previous Research

The current study used elements of previous research as its framework for development, and therefore several similarities and differences exist between them. The literature reviewed applies concepts of using pedometers, implementation intentions, and e-technology to influence behaviors like physical activity participation across various settings including the worksite. Few studies, however, combine all of these approaches into a single intervention. This section reflects on the literature to compare and contrast its features with the present study.

The current study can be evaluated with respect to previous research that implemented pedometer programs to increase physical activity. Freak-Poli et al. (2011) examined an intervention that was part of the Global Corporate Challenge event, which is an organization that administers worksite pedometer programs. Although the worksite setting was a parallel to the current study, the structure of its pedometer program differed; in this study, teams were comprised of seven members and goals were assigned to individuals. In the study by Tudor-Locke et al. (2004), participants set their own step goals like the current study, yet differed on other key elements. These programs did not incorporate many of the additional features of the Pedometer Challenge, which included different participation tracks, prizes, and teams of four to six individuals. Alternatively, the present study shared a commonality with the intervention by Freak-Poli et al. (2011), by including weekly email messages. These emails were purely

encouragement messages however, and therefore differed from the implementation intention emails sent in the present study.

E-technology in the form of email messages was a key component to the present study. Several other interventions in addition to that of Freak-Poli et al. (2011) incorporated the use of emails (Tate, Jackvony & Wing, 2003; Dinger, Heesch, Ciprianai & Qualls, 2006). Although these studies applied a similar form of e-technology, the core content of the emails differed from the present intervention. In this intervention, emails included concepts of implementation intentions.

Previous research establishes implementation intentions as a powerful strategy in impacting behaviors, including engagement in physical activity (Milne, Orbell & Sheeran, 2002; Sheeran & Silverman, 2003; Prestwich, Perugini & Hurling, 2009). These studies shared some common key features with the present intervention as well, however they did not combine all of the approaches discussed. The intervention by Prestwich, Perugini, and Hurling (2009), was most similar to the present study. The intervention successfully demonstrated that plan reminders are an instrumental approach in strengthening the effectiveness of implementation intentions for physical activity. The researchers similarly combined the use of implementation intentions and e-technology to influence physical activity participation. The intervention, however, used text messaging rather than emails and did not incorporate pedometers or the workplace setting.

Together, these past studies capture all of the major components as the current study: implementation intentions, pedometers, e-technology, the worksite setting, and influencing physical activity participation. Additionally, these research studies provide convincing evidence that is valuable to the present intervention. The current study builds on this literature by

incorporating all of the components into one intervention. This study further advances on previous research by using multiple emails with different implementation intention messages over the course of several weeks, whereas the studies reviewed only presented a single message over a shorter duration. Furthermore, this intervention was incorporated into a pedometer program that consisted of several key components that differed from many other programs. With these similarities and variations, it is intended that the current study build on the existing literature base.

Summary

Although none of the three hypotheses of this study were supported, the findings may still provide convincing evidence for the use of implementation intentions to assist in physical activity adherence. Specifically, intervention group participants demonstrated a significantly greater change in walking levels from before the Pedometer Challenge to during the Challenge compared to the control group. These outcomes suggest that emails featuring implementation intentions may help enhance pedometer programs in the workplace. The findings of this study may provide insights to health promotion practitioners on increasing adherence to physical activity programs and may be used in designing interventions to increase physical activity levels and improve health risk factors.

CHAPTER 5

SUMMARY AND RECOMMENDATIONS

Summary

The purpose of this study was to determine the impact that email-delivered implementation intentions have on physical activity behaviors of participants in a worksite pedometer challenge. There was a sample of 56 faculty and staff members who were participating in the 2012 Steps to A*healthy*U Pedometer Challenge at American University that completed both of the online surveys required for the current study. During the six-week Pedometer Challenge, intervention group participants received three planning emails, which featured concepts of implementation intentions. These participants received an additional three emails over the course of six weeks after the Pedometer Challenge ended. The online surveys assessed control and intervention group participants' physical activity levels before, during, and after the Challenge. There were three hypotheses in this study:

- Relative to the control group, participants in the intervention group will demonstrate greater physical activity levels during the Pedometer Challenge.
- In relation to the control group, intervention group participants will exhibit greater levels of physical activity six-weeks post Pedometer Challenge.
- Compared to the control group, the intervention group will log steps for a greater number of weeks over the course of the Pedometer Challenge.

None of the three hypotheses were supported by the results of the study. However, intervention group participants demonstrated a significantly greater change in walking levels from before the Pedometer Challenge to during the Challenge compared to the control group.

These findings suggest that emails featuring implementation intentions may help enhance pedometer programs in the workplace. Several speculations may help explain these outcomes.

It is proposed that the Pedometer Challenge itself likely affected participants' motivation and adherence to physical activity. Furthermore, the intervention group's greater increase in walking indicates that the implementation intention messages influenced physical activity adherence as well. Therefore, the results of the study suggest that perhaps the two systems work best together to provide an outcome greater than each of the methods could have provided independently.

Recommendations

Based on the results of this study, there are several recommendations for future studies that examine the impact that implementation intentions have on participants in a worksite pedometer challenge:

- Future studies may request that intervention group participants reply to the emails and tailor the guidelines.
- Additional survey questions may inquire whether control group participants used the team-standing emails in any way. This may help in comparing the two groups in greater detail and determining how emails are used.
- In the present study, the three emails sent after the Pedometer Challenge no longer mentioned participants' personal step goals. Future studies may incorporate goals back into the emails to remind participants of their previous goals. This may help maintain similar message formatting for planning emails and provide more opportunity for assessing the impact that these goals have on physical activity behaviors.

- Subsequent studies may extend the duration of the Pedometer Challenge to longer than six weeks. This may provide insight into how long the pedometer program and supplemental planning emails should be in order to significantly impact participants' physical activity behaviors.
- An update to this study may be to send out additional planning emails more frequently during and after the pedometer program.
- Additional factors of the Pedometer Challenge may be measured in future studies to understand the impact that these components have on participants' physical activity behaviors. Additional factors may include team support, goal setting, incentives, and community impact. Information on goal setting and team support were collected in the present study, but were not utilized in data analyses.

APPENDIX A

REGISTRATION FORM

First Name

Last Name

Email Address Camps Phone Number

Department

Employment Status
Full-time Staff
Part-time Staff
Full-time Faculty
Part-time/Adjunct Faculty
Student Worker
Other

Participation Status
Free Agent
Team

How many days per week do you currently participate in 30+ minutes of moderate intensity physical activity?
0
1-2
3-5
6-7

How did you hear about the Pedometer Challenge?
Today@AU
Personal Email
AhealthyU Website
AhealthyU Facebook Page
AhealthyU Staff Member
Friend/Colleague
Mass Email Flyer/Postcard
Campus Mail Flyer/Postcard

Will you serve as a Team Captain during the 2012 Pedometer Challenge?
Yes
No

Team Name

Team Member 1

Team Member 2

Team Member 3

Team Member 4

Team Member 5

Participation Type
Competition (Compete against other teams to be the top stepping team)
Challenge (Work as a team to surpass your team step goal in a non-competitive environment)

Team Captain Name

What is your daily step total goal during the 2012 Pedometer Challenge?

APPENDIX B

SAMPLE TEAM STANDING EMAIL

Competition Track Email

Good Afternoon Steppers,

Your hot stepping seemed to bring out the sun during Week 2 of the Pedometer Challenge. Let's give it up for the top five teams in our standings this week:

Michael Scott's Dunder Mifflin - 19729
Your Pace or Mine? - 17791
Step Sisters - 17329
Sensible Shoes 1 - 16932
Wonky Walkers - 15749

If you're looking for ways to boost your team's ranking during Week 3 of the Challenge, we invite you to join us for one of our many AhealthyU fitness opportunities:

- On Mondays and Wednesdays, join us at noon in the lobby of Jacobs Fitness Center for our 45-minute Learn N Burn. This group takes walks around campus while discussing a variety of health and wellness topics.
- On Tuesdays and Thursdays, join us at noon for 45-minute Yoga sessions for all levels. On Tuesdays we meet in the East Quad Building Lounge. On Thursdays we're on Tenley Campus in Federal 173.
- Tuesday mornings (7:00am) and evenings (5:30pm) we also lead the AU Run Club. Meet in the lobby of Bender Arena for group fun runs. Runs of various distances are provided for runners of all levels.
- Of course we always have fun on Fridays too. The AU Laugh Club meets from noon to 12:45pm in the AhealthyU Office, Letts Lower Level 3. Come enjoy this unique form of exercise and stress reduction and start your weekend with a big smile.

Visit www.american.edu/hr/ahealthyu/steps2012-week2.cfm to see a complete list of standings all participants who took over 10,000 steps per day during Week 2 of the Pedometer Challenge.

Happy Stepping in Week 3!

In health,
Amy, Matt and Leah

Challenge Track Email

Good Afternoon Steppers,

Your hot stepping seemed to bring out the sun during Week 2 of the Pedometer Challenge.

Your team, _____ is averaging _____ steps per day as a team through Week 2. That puts you JUST BELOW your team goal of _____ steps per day.

If you're looking for ways to boost your steps during Week 3 of the Challenge, we invite you to join us for one of our many AhealthyU fitness opportunities:

- On Mondays and Wednesdays, join us at noon in the lobby of Jacobs Fitness Center for our 45-minute Learn N Burn. This group takes walks around campus while discussing a variety of health and wellness topics.
- On Tuesdays and Thursdays, join us at noon for 45-minute Yoga sessions for all levels. On Tuesdays we meet in the East Quad Building Lounge. On Thursdays we're on Tenley Campus in Federal 173.
- Tuesday mornings (7:00am) and evenings (5:30pm) we also lead the AU Run Club. Meet in the lobby of Bender Arena for group fun runs. Runs of various distances are provided for runners of all levels.
- Of course we always have fun on Fridays too. The AU Laugh Club meets from noon to 12:45pm in the AhealthyU Office, Letts Lower Level 3. Come enjoy this unique form of exercise and stress reduction and start your weekend with a big smile.

Visit www.american.edu/hr/ahealthyu/steps2012-week2.cfm to see a list of all participants who took over 10,000 steps per day during Week 2 of the Pedometer Challenge.

Happy Stepping in Week 3!

In health,
Amy, Matt and Leah

APPENDIX C

PLANNING EMAILS

Planning Email 1

Subject: Pedometer Challenge—How Was Your First Week?

Hi [*First Name*],

I hope you're off to a good start of the pedometer challenge! The daily personal goal you set was [*daily step goal*] steps per day, which converts to [*weekly step goal*] steps each week. This past week you accumulated [*weekly steps*] steps and [*met/exceeded/were slightly under*] your weekly goal. By meeting or exceeding this goal every week you may experience several advantages, including a sense of personal accomplishment, team success, and/or the many health benefits associated with physical activity.

Many people find that they intend to walk during the week, but then forget or 'never get around to it.' By forming a definite plan of when and where you'll walk, you're more likely to follow through with it.

I've provided you with a guide below that will help you form a plan for the upcoming week:

During the next week, I will walk on _____(day or days)
at _____(time of day) at/in _____(place). In order to fulfill this goal, I will need to _____(preparations or reminders that need to be set).

Here is an example of how this might look:
During the next week, I will walk on Monday, Tuesday, Thursday, and Friday at 12pm during lunch at the AU campus. In order to fulfill this goal, I will need to pack my walking shoes and socks the night before and set a reminder in my calendar.

Please take a moment to plan your walking this week.

Be well,
Leah

Planning Email 2

Subject: Pedometer Challenge—Rack Up More Steps During the Day

Hi [*First Name*],

What's the number one excuse for not engaging in physical activity? Lack of time. By making small changes to your daily schedule, you can increase the number of steps you take each day.

Here are a few tips for getting in some extra steps during the day:

1. **Be an active TV watcher**. When watching TV, make a point to be physically active—March in place or do some jumping jacks during a show or commercials.
2. **Mix socializing with exercising**. Make your social time more active by planning events that get you moving—Instead of meeting a friend for dinner, go on a walk together.
3. **Park farther away or get off a stop early**. If you drive to work or to run errands, park as far away from the building as you can and walk the remainder of the distance. If you take public transportation, try getting off at an earlier stop and then walk the rest of the way.
4. **Use restrooms on another floor**. Make an effort to use restrooms on different floors and take the stairs. This can be practiced at work or if your home has multiple levels.
5. **Walk and talk on the phone**. Whether at work or at home, pace while on the phone. You can even plan ahead and schedule to return phone calls for when you're on a walk.

This past week you reported a total of [*total steps*] steps, [*meeting/exceeding/slightly under*] your [*weekly step goal*] weekly step goal. Think about how you might incorporate some of these tips into your day and decide when you'll walk this week. You can use the guidelines I provided below to help you plan for the upcoming week:

During the next week, I will increase my step count by _____ (activity you plan to perform) on _____(day or days) at _____(time of day) at/in _____(place).

For example: During the next week, I will increase my step count by marching in place while watching TV on Monday, Thursday, Friday, and Saturday at 8pm at home.
I will also increase my step count by going on walks on Monday through Friday before work in my neighborhood.

Please take a moment to plan which activities you'll do this week to boost your step count.

In health,

Leah

Planning Email 3

Subject: Pedometer Challenge—4th of July Plans?

Hi [*First Name*],

Congrats on logging [*step total*] steps over this past week! You [*reached, surpassed, were a little short of*] your goal of [*weekly step goal*] steps per week.

The 4th of July is filled with traditions of fireworks, parades, and barbecues. But don't let these celebrations throw you off step. The calories in typical 4th of July foods can add up—so make sure you keep pace over the holiday.

1 Hamburger = **7,000 steps**
1 Hot Dog = **5,250 steps**
1 Corn on the Cob = **2,250 steps**
1 Cup of Baked Beans = **5,000 steps**
1 Cup of Potato Salad = **6,500 steps**
1 Slice of Watermelon = **1,500 steps**
1 Cup of Lemonade = **2,000 steps**

Whether you're traveling out of town or staying home for the holiday, you don't have to take a vacation from exercise too. Take a few moments to plan how you will get in your steps and stay on track during this week's break in your normal routine:

If I find that I am _____ (events during the holiday break) this week, I will walk on _____ (day or days) at _____(time of day) at/in _____(place). In order to follow through with this, I will need to _____ (preparations you need to make ahead of time)

For example:

If I find that I am on vacation at the beach this week, I will walk on Friday and Saturday at 10am on the boardwalk. In order to follow through with this, I will need to pack my workout clothes and shoes in my suitcase.

If I find that I am preparing for 4th of July celebrations this week, I will walk on Wednesday at 3pm before the barbeque in my neighborhood. In order to follow through with this, I will need to set an alarm 20 minutes before to remind me to walk.

Please consider your schedule when planning your walking for the upcoming week.

Be Well,

Leah

Planning Email 4

Subject: Pedometer Challenge—Did You Know?

Hi [*First Name*],

Did you know that people all over the world have participated in pedometer programs? One study showed how Americans match up to other countries and cultures:
Americans: **5,117** steps per day
Japanese: **7,168** steps per day
Swiss: **9,650** steps per day
Australians: **9,695** steps per day
And the winners are… the Amish! Amish men take more than **18,000** steps a day, and Amish women averaged over **14,000** steps a day.

Now that the Pedometer Challenge is over, how will you continue to maintain your steps? Use the guide below to help plan how you'll stay active this week:

In this upcoming week, I will walk on _____(day or days)
at _____(time of day) at/in _____(place). To do this, I will need to _____(preparations or reminders that need to be set).

For example:
In this upcoming week, I will walk on Monday, Wednesday, and Friday at 5:30pm after work in the gym. To do this, I will need to pack my gym bag the night before and leave it by the door.

Happy stepping this week!

Be well,

Leah

Planning Email 5

Subject: What's Your Schedule Like?

Hi [*First Name*],

Busy schedules can get in the way of physical activity, not to mention the effect that bad weather and other obstacles can have on your walking plans. Walking up stairs is a simple way to get in more steps, especially on rainy or hot days. Here are some buildings on campus that have stairs you could plan to climb this week.

(Steps were calculated starting from main entrance stairwells to the top of the building and back down).

Library: **132 steps**
Ward Building: **120 steps**
SIS: **104 steps**
Kogod: **42 steps**

What do you have going on this week that might get in the way of your walking? Here's your chance to plan for those challenges:

If I know that I _____ (obstacle(s) you may encounter) this week, I will walk on _____ (day or days) at _____ (time of day) at/in _____ (place). In order to follow through with this, I will need to _____ (plans you need to make ahead of time in order to be prepared).

For example:
If I know that I have several dinner meetings this week, I will walk on Wednesday and Friday at 8am in my neighborhood. In order to follow through with this, I will need to wake up 30 minutes early on these days.

If I know that I will not want to walk outside in the heat this week, I will walk on Monday and Tuesday at 12pm during lunch in the Library stairwell. In order to follow through with this, I will need to bring my walking shoes to work.

Take a few moments to plan how you will overcome the obstacles that may arise this week.

In health,

Leah

Planning Email 6

Subject: Who can help you?

Good Afternoon [*First Name*],

Walking with others can make exercise more enjoyable, and when it's more enjoyable, you're more likely to stay on track with your physical activity. Is there anyone who you might like to walk with this week—your former Pedometer Challenge team members, family, friends, coworkers, or others? Consider your non-human companions as well—studies have shown that dog owners are more active overall than people who don't have dogs. One study even showed that some people are more likely to walk regularly if their companion is canine rather than human!

Think about who you can recruit to walk with you this week, and take this opportunity to make those plans by filling in the guidelines below.

In the upcoming week, I will walk with _____ (companion/s) on _____(day or days) at _____(time of day) at/in _____(place). In order to plan for this, I will need to _____ (plans you need to make to prepare for this).

For Example:
In the upcoming week, I will walk with my coworker, Jane on Tuesday and Friday at noon during lunch at the AU campus. In order to plan for this, I will need to email Jane beforehand to schedule this.

Have a great week!

Leah

APPENDIX D

RECRUITMENT EMAIL

Subject: Pedometer Challenge—Unique Opportunity

Thank you for registering for the Steps to AhealthyU Pedometer Challenge. As part of this year's challenge, we would like to invite you to participate in a research study on how email messages may impact physical activity. The theme of each weekly email will be around planning and goal setting. This study will run the length of the 6-week pedometer challenge, and we estimate the time commitment required for participation to be around 5 minutes per week. In addition to the weekly emails, participants will be asked to complete two surveys upon conclusion of the 6-week challenge. AhealthyU graduate assistant Leah Tasman will be conducting this research to help AhealthyU understand participation and adherence to physical activity programs to better serve you. This research will also help fulfill her Master's thesis requirement in the School of Education, Teaching, and Health. All those who participate in the study will receive an AhealthyU moisture-wicking t-shirt.

Please respond to this email by next Tuesday if you are willing to participate in the study.

In Health,

Amy

APPENDIX E

SURVEYS

6-Week Intervention Survey

In the space provided, please create your individual code as instructed. This code is for internal research use only and will not be linked to your identity. Only aggregate data from this survey will be used.
Please type the first two letters of your full first name, then type the first two letters of your last name, followed by the last two digits of your birth year.
Example: Margaret Smith born in 1954; Code: MaSm54

_____

Which gender do you most closely identify with?
Male
Female

Please specify your age group
18-25
26-35
36-45
46-55
56-65
66 or over

Please specify your employment status
Full-time Staff
Part-time Staff
Full-time Faculty
Part-time/Adjunct Faculty
Student Worker
Other: _____

Team Participation Track during the 2012 Pedometer Challenge
Challenge (Non-Competitive)
Competitive

How many days per week do you currently participate in 30+ minutes of moderate intensity physical activity? (ex: walking briskly)
0
1-2
3-5

6-7

Did you serve as a Team Captain during the 2012 Pedometer Challenge?
Yes
No

Do you remember your Daily Step Goal from the Pedometer Challenge?
Yes
No

What was your Daily Step Goal during the Pedometer Challenge?

_____

Over the course of the Pedometer Challenge, you should have received 5 weekly emails from AhealthyU regarding Team Standings. How many of these "Team Standings" emails did you actually receive?
0
1
2
3
4
5

How often did you read the "Team Standings" emails?
I did not read any of the emails
I read 1 email
I read 2 emails
I read 3 emails
I read 4 emails
I read 5 emails

Please explain why you did not read the "Team Standings" emails

_____

Over the course of the Pedometer Challenge, you should have received 3 weekly emails from AhealthyU asking you to plan your walking for the upcoming week. How many of these "Planning" emails did you actually receive?
0
1
2
3

How often did you read these “Planning” emails?
I did not read any of the emails
I read 1 email
I read 2 emails
I read 3 emails

Please explain why you did not read the “Planning” emails

_____

Each of the “Planning” emails provided a guide and suggested that you plan your walking for the upcoming week. How often did you tailor these guides to your own plans for the week?

I did not receive and/or read these "Planning" emails
I tailored the guides in all 3 of the "Planning" emails
I tailored the guides in 2 of the "Planning" emails
I tailored the guides in 1 of the "Planning" emails
I did not tailor the guides in any of the "Planning" emails

In what way did you use these “Planning” emails?
Check any that apply
[I did not use these emails in any way]
[I used them to plan my walking for the week]
[I used them as a reminder to walk]
[I used them as motivation to walk]
[Other]

The degree to which the tips and facts in the "Planning" emails were relevant
not at all relevant
a little relevant
somewhat relevant
relevant
very relevant

The degree to which the tips and facts in the "Planning" emails were useful
not at all useful
a little useful
somewhat useful
useful
very useful

The degree to which the "Planning" emails kept your attention
did not keep my attention at all
kept my attention a little

kept my attention somewhat
kept my attention
kept my attention very much

The degree to which the planning guides were helpful
not at all helpful
a little helpful
somewhat helpful
helpful
very helpful

Please explain any other positive or negative impressions of the "Planning" emails

_____

The average amount you communicated with you team about the Pedometer Challenge during the week
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

The average amount you walked together with your teammates during the Pedometer Challenge
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

The amount your team contributed to your motivation during the Pedometer Challenge
not at all
a little
somewhat
much
very much

Please explain how your team may have either positively or negatively influenced your participation in the Pedometer Challenge in any way

_____

To what extent did setting a personal daily goal impact your motivation during the Pedometer Challenge?
not at all
a little

somewhat
much
very much

To what extent did logging your steps impact your motivation during the Pedometer Challenge?
not at all
a little
somewhat
much
very much

Please describe, if any, specific barriers or obstacles that hindered your participation in any way or for any period of time during the Pedometer Challenge. If this does not apply to you, please type "N/A"

_____

Please describe, if any, specific triumphs or milestones that occurred during your participation in the Pedometer Challenge. If this does not apply to you, please type "N/A"

_____

Please indicate how often you participated in the following activities BEFORE the Pedometer Challenge and DURING the Pedometer Challenge:

[BEFORE the Pedometer Challenge] Walking
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[DURING the Pedometer Challenge] Walking
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[BEFORE the Pedometer Challenge] Jogging/Running
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week

5-7 days of the week

[DURING the Pedometer Challenge] Jogging/Running
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[BEFORE the Pedometer Challenge] Biking
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[DURING the Pedometer Challenge] Biking
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[BEFORE the Pedometer Challenge] Swimming
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[DURING the Pedometer Challenge] Swimming
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[BEFORE the Pedometer Challenge] Elliptical
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[DURING the Pedometer Challenge] Elliptical
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[BEOFRE the Pedometer Challenge] Resistance Training
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[DURING the Pedometer Challenge] Resistance Training
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[BEFORE the Pedometer Challenge] Yoga
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[DURING the Pedometer Challenge] Yoga
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Additional Activity 1:
If you participated in an additional form of physical activity before and/or during the Pedometer Challenge, please specify one activity in the space below. If you did not participate in any additional activity, please proceed.

_____

[BEFORE the Pedometer Challenge] Additional Activity 1
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[DURING the Pedometer Challenge] Additional Activity 1
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Additional Activity 2:
If you participated in another additional form of physical activity before and/or during the Pedometer Challenge, please specify one activity in the space below. If you did not participate in another additional activity, please proceed.

_____

[BEFORE the Pedometer Challenge] Additional Activity 2
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[DURING the Pedometer Challenge] Additional Activity 2
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Additional Activity 3:
If you participated in another additional form of physical activity before and/or during the Pedometer Challenge, please specify one activity in the space below. If you did not participate in another additional activity, please proceed.

_____

[BEFORE the Pedometer Challenge] Additional Activity 3
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[DURING the Pedometer Challenge] Additional Activity 3
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Please use the space below to provide any additional comments you wish to express pertaining to your experience in the Pedometer Challenge

_____

6-Week Control Survey

In the space provided, please create your individual code as instructed. This code is for internal research use only and will not be linked to your identity. Only aggregate data from this survey will be used.
Please type the first two letters of your full first name, then type the first two letters of your last name, followed by the last two digits of your birth year.
Example: Margaret Smith born in 1954; Code: MaSm54

_____

Which gender do you most closely identify with?
Male
Female

Please specify your age group
18-25
26-35
36-45
46-55
56-65
66 or over

Please specify your employment status
Full-time Staff
Part-time Staff
Full-time Faculty
Part-time/Adjunct Faculty
Student Worker
Other: _____

Team Participation Track during the 2012 Pedometer Challenge
Challenge (Non-Competitive)
Competitive

How many days per week do you currently participate in 30+ minutes of moderate intensity physical activity? (ex: walking briskly)
0
1-2
3-5
6-7

Did you serve as a Team Captain during the 2012 Pedometer Challenge?
Yes
No

Do you remember your Daily Step Goal from the Pedometer Challenge?
Yes
No

What was your Daily Step Goal during the Pedometer Challenge?

_____

Over the course of the Pedometer Challenge, you should have received 5 weekly emails from AhealthyU regarding Team Standings. How many of these "Team Standings" emails did you actually receive?
0
1
2
3
4
5

How often did you read the "Team Standings" emails?
I did not read any of the emails
I read 1 email
I read 2 emails
I read 3 emails
I read 4 emails
I read 5 emails

Please explain why you did not read the "Team Standings" emails

_____

The average amount you communicated with you team about the Pedometer Challenge during the week
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

The average amount you walked together with your teammates during the Pedometer Challenge
0 days of the week
1-2 days of the week

3 days of the week
4 days of the week
5-7 days of the week

The amount your team contributed to your motivation during the Pedometer Challenge
not at all
a little
somewhat
much
very much

Please explain how your team may have either positively or negatively influenced your participation in the Pedometer Challenge in any way

_____

To what extent did setting a personal daily goal impact your motivation during the Pedometer Challenge?
not at all
a little
somewhat
much
very much

To what extent did logging your steps impact your motivation during the Pedometer Challenge?
not at all
a little
somewhat
much
very much

Please describe, if any, specific barriers or obstacles that hindered your participation in any way or for any period of time during the Pedometer Challenge. If this does not apply to you, please type "N/A"

_____

Please describe, if any, specific triumphs or milestones that occurred during your participation in the Pedometer Challenge. If this does not apply to you, please type "N/A"

_____

Please indicate how often you participated in the following activities BEFORE the Pedometer Challenge and DURING the Pedometer Challenge:

[BEFORE the Pedometer Challenge] Walking

0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[DURING the Pedometer Challenge] Walking
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[BEFORE the Pedometer Challenge] Jogging/Running
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[DURING the Pedometer Challenge] Jogging/Running
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[BEFORE the Pedometer Challenge] Biking
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[DURING the Pedometer Challenge] Biking
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[BEFORE the Pedometer Challenge] Swimming
0 days of the week

1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[DURING the Pedometer Challenge] Swimming
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[BEFORE the Pedometer Challenge] Elliptical
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[DURING the Pedometer Challenge] Elliptical
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[BEOFRE the Pedometer Challenge] Resistance Training
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[DURING the Pedometer Challenge] Resistance Training
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[BEFORE the Pedometer Challenge] Yoga
0 days of the week
1-2 days of the week

3 days of the week
4 days of the week
5-7 days of the week

[DURING the Pedometer Challenge] Yoga
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Additional Activity 1:
If you participated in an additional form of physical activity before and/or during the Pedometer Challenge, please specify one activity in the space below. If you did not participate in any additional activity, please proceed.

_____

[BEFORE the Pedometer Challenge] Additional Activity 1
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[DURING the Pedometer Challenge] Additional Activity 1
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Additional Activity 2:
If you participated in another additional form of physical activity before and/or during the Pedometer Challenge, please specify one activity in the space below. If you did not participate in another additional activity, please proceed.

_____

[BEFORE the Pedometer Challenge] Additional Activity 2
0 days of the week
1-2 days of the week

3 days of the week
4 days of the week
5-7 days of the week

[DURING the Pedometer Challenge] Additional Activity 2
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Additional Activity 3:
If you participated in another additional form of physical activity before and/or during the Pedometer Challenge, please specify one activity in the space below. If you did not participate in another additional activity, please proceed.

_____

[BEFORE the Pedometer Challenge] Additional Activity 3
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

[DURING the Pedometer Challenge] Additional Activity 3
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Please use the space below to provide any additional comments you wish to express pertaining to your experience in the Pedometer Challenge

_____

12-Week Intervention Survey

In the space provided, please create your individual code as instructed. This code is for internal research use only and will not be linked to your identity. Only aggregate data from this survey will be used. Please type the first two letters of your full first name, then type the first two letters of your last name, followed by the last two digits of your birth year.
Example: Margaret Smith born in 1954; Code: MaSm54 If you completed the previous survey 6-weeks ago, please make sure to use the same code in this survey.

_____

Since the conclusion of the Steps to AhealthyU 2012 Pedometer Challenge, you should have received 3 additional weekly emails from AhealthyU asking you to plan your walking for the upcoming week. How many of these "Planning" emails did you actually receive?
0
1
2
3

How often did you read these "Planning" emails?
I did not read any of the emails
I read 1 email
I read 2 emails
I read 3 emails

Please explain why you did not read the "Planning" emails

Each of the "Planning" emails provided a guide and suggested that you plan your walking for the upcoming week. How often did you tailor these guides to your own plans for the week?
I did not receive and/or read these "Planning" emails
I tailored the guides in all 3 of the "Planning" emails
I tailored the guides in 2 of the "Planning" emails
I tailored the guides in 1 of the "Planning" emails
I did not tailor the guides in any of the "Planning" emails

In what way did you use these "Planning" emails?
Check all that apply
I did not use these emails in any way
I used them to plan my walking for the week
I used them as a reminder to walk
I used them as motivation to walk

The degree to which the tips and facts in the "Planning" emails were relevant

not at all relevant
a little relevant
somewhat relevant
relevant
very relevant

The degree to which the tips and facts in the "Planning" emails were useful
not at all useful
a little useful
somewhat useful
useful
very useful

The degree to which the "Planning" emails kept your attention
did not keep my attention at all
kept my attention a little
kept my attention somewhat
kept my attention
kept my attention very much

The degree to which the planning guides were helpful
not at all helpful
a little helpful
somewhat helpful
helpful
very helpful

Please explain any other positive or negative impressions of the “Planning” emails

_____

To what extent are you currently communicating with your Pedometer Challenge teammates about Physical Activity since the Pedometer Challenge ended?
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

To what extent are you currently walking with your former Pedometer Challenge teammates since the Pedometer Challenge ended?
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week

5-7 days of the week

To what extent are your former Pedometer Challenge team members currently contributing to your motivation to participate in physical activity?
not at all
a little
somewhat
much
very much

Please explain how your former teammates are currently either positively or negatively influencing your participation in physical activity in any way

_____

Are you continuing to set physical activity goals since the Pedometer Challenge ended?
Yes
No

To what extent does setting physical activity goals impact your motivation to exercise since the Pedometer Challenge ended?
not at all
a little
somewhat
much
very much

Please indicate how often you wear your pedometer since the Pedometer Challenge ended
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

To what extent does wearing your pedometer impact your motivation to participate in physical activity since the Pedometer Challenge ended?
not at all
a little
somewhat
much
very much

Please indicate how often you log your steps since the Pedometer Challenge ended
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

To what extent does logging your steps impact your motivation to participate in physical activity since the Pedometer Challenge ended?
not at all
a little
somewhat
much
very much

Please describe, if any, specific barriers or obstacles that hindered your participation in physical activity in any way or for any period of time since the end of the Pedometer Challenge. If this does not apply to you, please type "N/A"

_____

Please describe, if any, specific triumphs or milestones that occurred since the end of the Pedometer Challenge. If this does not apply to you, please type "N/A"

_____

Please indicate how often you participate in the following activities since the Pedometer Challenge ended:

Walking
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Jogging/Running
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Biking
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Swimming
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Elliptical
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Resistance Training
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Yoga
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Additional Activity 1:
If you participated in an additional form of physical activity before and/or during the Pedometer Challenge, please specify one activity in the space below. If you did not participate in any additional activity, please proceed.

_____

Additional Activity 1
0 days of the week
1-2 days of the week

3 days of the week
4 days of the week
5-7 days of the week

Additional Activity 2:
If you participated in another additional form of physical activity before and/or during the Pedometer Challenge, please specify one activity in the space below. If you did not participate in another additional activity, please proceed.

_____

Additional Activity 2
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Additional Activity 3:
If you participated in another additional form of physical activity before and/or during the Pedometer Challenge, please specify one activity in the space below. If you did not participate in another additional activity, please proceed.

_____

Additional Activity 3
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

How many days per week do you currently participate in 30+ minutes of moderate intensity physical activity? (ex: walking briskly)
0
1-2
3-5
6-7

How does your current level of physical activity compare to the level of physical activity achieved during the 6-week Pedometer Challenge?
I am more active now than I was during the Pedometer Challenge

I am less active now than I was during the Pedometer Challenge
My level of activity is about the same as it was during the Pedometer Challenge

Please use the space below to provide any additional comments you wish to express pertaining to the emails, communication with former Pedometer Challenge teammates, your motivation to participate in physical activity, or physical activity in general since the conclusion of the Pedometer Challenge

_____

For reporting purposes, please indicate your race/ethnicity
White, Non-Hispanic
Black or African American
Hispanic or Latino
Asian
Native Hawaiian or Other Pacific Islander
American Indian or Alaska Native
Other

12-Week Control Survey

In the space provided, please create your individual code as instructed. This code is for internal research use only and will not be linked to your identity. Only aggregate data from this survey will be used. Please type the first two letters of your full first name, then type the first two letters of your last name, followed by the last two digits of your birth year.
Example: Margaret Smith born in 1954; Code: MaSm54 If you completed the previous survey 6-weeks ago, please make sure to use the same code in this survey.

_____

To what extent are you currently communicating with your Pedometer Challenge teammates about Physical Activity since the Pedometer Challenge ended?
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

To what extent are you currently walking with your former Pedometer Challenge teammates since the Pedometer Challenge ended?
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

To what extent are your former Pedometer Challenge team members currently contributing to your motivation to participate in physical activity?
not at all
a little
somewhat
much
very much

Please explain how your former teammates are currently either positively or negatively influencing your participation in physical activity in any way

Are you continuing to set physical activity goals since the Pedometer Challenge ended?
Yes
No

To what extent does setting physical activity goals impact your motivation to exercise since the Pedometer Challenge ended?
not at all
a little
somewhat
much
very much

Please indicate how often you wear your pedometer since the Pedometer Challenge ended
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

To what extent does wearing your pedometer impact your motivation to participate in physical activity since the Pedometer Challenge ended?
not at all
a little
somewhat
much
very much

Please indicate how often you log your steps since the Pedometer Challenge ended
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

To what extent does logging your steps impact your motivation to participate in physical activity since the Pedometer Challenge ended?
not at all
a little
somewhat
much
very much

Please describe, if any, specific barriers or obstacles that hindered your participation in physical activity in any way or for any period of time since the end of the Pedometer Challenge. If this does not apply to you, please type "N/A"

_____

Please describe, if any, specific triumphs or milestones that occurred since the end of the Pedometer Challenge. If this does not apply to you, please type "N/A"

_____

Please indicate how often you participate in the following activities since the Pedometer Challenge ended:

Walking
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Jogging/Running
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Biking
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Swimming
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Elliptical
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Resistance Training

0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Yoga
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Additional Activity 1:
If you participated in an additional form of physical activity before and/or during the Pedometer Challenge, please specify one activity in the space below. If you did not participate in any additional activity, please proceed.

_____

Additional Activity 1
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Additional Activity 2:
If you participated in another additional form of physical activity before and/or during the Pedometer Challenge, please specify one activity in the space below. If you did not participate in another additional activity, please proceed.

_____

Additional Activity 2
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

Additional Activity 3:
If you participated in another additional form of physical activity before and/or during the Pedometer Challenge, please specify one activity in the space below. If you did not participate in another additional activity, please proceed.

_____

Additional Activity 3
0 days of the week
1-2 days of the week
3 days of the week
4 days of the week
5-7 days of the week

How many days per week do you currently participate in 30+ minutes of moderate intensity physical activity? (ex: walking briskly)
0
1-2
3-5
6-7

How does your current level of physical activity compare to the level of physical activity achieved during the 6-week Pedometer Challenge?
I am more active now than I was during the Pedometer Challenge
I am less active now than I was during the Pedometer Challenge
My level of activity is about the same as it was during the Pedometer Challenge

Please use the space below to provide any additional comments you wish to express pertaining to the emails, communication with former Pedometer Challenge teammates, your motivation to participate in physical activity, or physical activity in general since the conclusion of the Pedometer Challenge

_____

For reporting purposes, please indicate your race/ethnicity
White, Non-Hispanic
Black or African American
Hispanic or Latino
Asian
Native Hawaiian or Other Pacific Islander
American Indian or Alaska Native
Other

APPENDIX F

INFORMED CONSENT

Consent to Participate in Research

Identification of Investigators & Purpose of Study

You are being asked to participate in a research study conducted by Leah Tasman from American University. The purpose of this study is to track pedometer activity of a select group of participants and to determine how planning emails might impact physical activity behaviors. This study will contribute to the student's completion of her Master's Thesis.

Research Procedures

Should you decide to participate in this research study, you will be asked to sign this consent form once all your questions have been answered to your satisfaction. This study consists of weekly email messages that may or may not impact physical activity behaviors through planning activities, two post surveys administered online, as well as participation in the Steps to AhealthyU Pedometer Challenge. The first online survey will be administered upon completion of the Pedometer Challenge and the second online survey will be administered 6 weeks post Pedometer Challenge. You will be asked to provide answers to a series of questions related to physical activity and your experience throughout the AhealthyU Pedometer Challenge. Participants in the study will be randomly assigned to an intervention or comparison condition, and thus may or may not receive intervention treatment.

Time Required

Overall, it is estimated that participation in this study will require a total of 1 hour, spread throughout the pedometer challenge period and 6-week follow-up. Time spent reading and reflecting on emails throughout the study will vary, but is estimated to take roughly 5 minutes per week. The post surveys will require approximately 5-7 minutes each.

Risks

The investigator does not perceive more than minimal risks from your involvement in this study. Physical risks associated with aerobic exercise may be faced due to participation in the Steps to AhealthyU Pedometer Challenge itself. The nature of the program, however, promotes walking, a low-risk activity. AhealthyU addresses issues associated with physical activity in the American University Release, Waiver of Liability and Assumption of Risk for Participation in 2012 AhealthyU Programs, which you must also sign to participate in the program. The emails and surveys of the study pose no additional physical risks. Psychological discomfort may be faced due to personal disappointment in physical activity levels, in which case participants would be referred to the Faculty and Staff Assistance Program.

Benefits

Potential benefits from participation in this study include increased physical activity, which may reduce the risk of some chronic diseases, improve mood, and improve energy levels. This research will benefit the health promotion field as a whole in contributing to the understanding of adherence to physical activity programs.

Confidentiality

The results of this research will potentially be presented at a conference. The results of this project will be coded in such a way that the respondent's identity will not be attached to the final form of this study. The researcher retains the right to use and publish non-identifiable data. While individual responses are confidential, aggregate data will be presented representing averages or generalizations about the responses as a whole. All data will be stored in a secure location accessible only to the researcher. Upon completion of the study, all information that matches up individual respondents with their answers will be destroyed.

Participation & Withdrawal

Your participation is entirely voluntary. You are free to choose not to participate. Should you choose to participate, you can withdraw at any time without consequences of any kind. You may also refuse to answer any individual question without consequences. You are still eligible to participate in the Steps to AhealthyU Pedometer Challenge and any individual or team prizes associated with that participation, regardless of whether you choose to partake in the study or not.

Questions about the Study

If you have questions or concerns during the time of your participation in this study, or after its completion or you would like to receive a copy of the final aggregate results of this study, please contact:

Leah Tasman
SETH-Health Promotion Management
American University
Leah.Tasman@student.american.edu

Anastasia Snelling
SETH-Health Promotion Management
American University
(202)885-6278
Stacey@american.edu

Questions about Your Rights as a Research Subject

Dr. David Haaga
Chair, Institutional Review Board
American University
(202)885-1718
dhaaga@american.edu

Matt Zembrzuski
IRB Coordinator
American University
(202)885-3447
irb@american.edu

Giving of Consent

I have read this consent form and I understand what is being requested of me as a participant in this study. I freely consent to participate. I have been given satisfactory answers to my questions. The investigator provided me with a copy of this form. I certify that I am at least 18 years of age.

_____
Name of Participant (Printed)

_____ _____
Name of Participant (Signed) Date

_____ _____
Name of Researcher (Signed) Date

APPENDIX G

AHEALTHYU RELEASE FORM

AMERICAN UNIVERSITY
RELEASE, WAIVER OF LIABILITY AND ASSUMPTION OF RISK
FOR PARTICIPATION IN
2012 A*HEALTHY*U PROGRAMS

I,_____, hereby understand and accept that my participation in any 2012 A*healthy*U Programs ("Program") is purely voluntary. In consideration of American University ("University") permitting me to participate in the Program, I (including my parents, guardians, and legal representatives) hereby agree to defend, indemnify and hold harmless the University and it's employees, officers, agents from and against all loss or expense (including costs and attorney's fees) by reason of liability for damages because of bodily injury including loss of use thereof, whether caused by or contributed to by me or my agents which might occur whatsoever in any way growing out of or resulting from my participation in the Program including but not limited to any cardiovascular, strength, flexibility, and/or aerobic exercise.

I further fully recognize that cardiovascular, strength, flexibility, and/or aerobic exercise involve substantial risk of injury including, but not limited to broken bones, torn ligaments, paralysis, catastrophic injury, and even death and agree to assume all risks and responsibilities associated with my participation.

I represent to the University that I am physically fit and capable of participating in all activities of the Program; there are no health-related reasons or problems of which I am aware that preclude or restrict or limit me from participating in the Program. I agree that I am solely responsible for determining my own limitations with regard to any activity.

I have medical insurance coverage appropriate for my participation in the Program. I understand and agree that the University may not provide any insurance for me in connection with my participation in the Program.

I authorize the University to secure necessary emergency medical treatment in the event of injury or illness while participating in the Program.

I will conduct myself in a safe and prudent manner while participating in the Program.

I hereby attest that I will abide by all policies and procedures related to the Program. In addition, I shall also fully comply with all applicable laws and University policies while participating in the Program. If I violate any policy or guideline or my participation in the Program is at any time deemed detrimental to the Program or any other participants, as determined by the University in its sole discretion, I fully understand that I may be removed from the Program without the University incurring any liability.

I give the University my permission to use information about me and any photograph or other likeness of me in any promotional materials or publications developed, published or otherwise distributed by the University.

I absolve, indemnify, defend and hold harmless American University from any breach of these representations.

I have had the opportunity to ask questions and receive explanation for any statements and policies that I do not understand.

I have read and fully understand the above provisions and agree to be bound by them, as indicated by my signature below.

Participant's Signature _____Date_____

Parent/Legal Guardian's Signature _____Date_____
(If student is under the age of 18)

APPENDIX H

SAMPLE INVITATION TO TAKE SURVEYS

Hi «First_Name»,

This is a reminder to please complete the Pedometer Challenge Study survey by next Thursday 7/26. If you have already completed it, I appreciate your help and you can disregard this message. If you have not completed the survey and submitted your answers, please follow the link provided below.

Your participation in my study is greatly valued and will help AhealthyU serve you better in future programs as well as help fulfill my Master's thesis requirement in the School of Education Teaching and Health.

The survey requires only about 5-10 minutes and you have the ability to save your answers and resume the survey later.

Also, in order to receive the AhealthyU moisture-wicking t-shirt as indicated in the welcome email, you must complete this survey.

Please click the link below to begin the survey:
http://pedometersurvey1.limequery.com/44994/lang-en

Thanks for your help,

Leah

APPENDIX I

SAMPLE REMINDER TO TAKE SURVEY

Hi «First_Name»,

This is a reminder to please complete the Pedometer Challenge Study survey by next Thursday 9/6. If you have already completed it, I appreciate your help and you can disregard this message. If you have not completed the survey and submitted your answers, please follow the link provided below.

Your participation in my study is greatly valued and will help AhealthyU serve you better in future programs as well as help fulfill my Master's thesis requirement in the School of Education Teaching and Health.

The survey requires only about 5-10 minutes and you have the ability to save your answers and resume the survey later.

Also, in order to receive the AhealthyU moisture-wicking t-shirt or athletic socks, you must complete this survey.

Please click the link below for the survey:
http://pedometersurvey1.limequery.com/93956/lang-en

Thanks for your help,

Leah

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