USING GOAL-SETTING AND PERFORMANCE FEEDBACK TO INCREASE ADULTS' DAILY WALKING

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ABSTRACT

Obesity has become a problem of social significance in the United States, particularly among adults. Physical activity, such as walking, can help combat the negative health effects of obesity and is a suitable target for intervention. The package intervention of goal-setting and performance feedback have emerged as a promising tool to increase physical activity. Therefore, the purpose of this study was to investigate the influence of goal-setting and performance feedback with a pedometer as a method of increasing daily walking and step counts of adults. This study used the range-bound changing criterion design and the traditional changing criterion design to examine the effects of the package intervention for adults in their natural day-to-day settings. This study extended previous research implementing goal-setting and performance feedback as a package intervention.

Keywords: Goal-setting, performance feedback, walking, steps, adults, pedometer, range-bound changing criterion design.

I wish to dedicate my thesis to my family, friends, and professors

without whom none of this would be possible.

To my parents who continually asked when I would be done grad school....

I did it!

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CHAPTER 1

USING GOAL-SETTING AND PERFORMANCE FEEDBACK TO INCREASE ADULTS' DAILY WALKING

According to the 2013-2014 National Health and Nutrition Examination survey, an estimated 32.7% of American adults 20 years and older are overweight, 37.9% are obese, and 7.7% are extremely obese (Fryar, Carroll, & Ogden, 2016). Obesity is linked to numerous health risks such as heart disease, stroke, high blood pressure, body pain, type 2 diabetes, various types of cancer, and even premature death. Clinical depression, anxiety, and other mental disorders have also been linked with obesity (National Institute of Diabetes and Digestive and, Kidney Diseases & National Institute Heart, Lung, and Blood Institute, 1998).

On top of the health risk factors, excess weight can affect one's employment and medical costs. On average, employees of the obese or overweight status miss an extra 1.1-1.7 days of work a year compared to someone of normal-weight (Stilwell, 2015). The link of obesity and associated illnesses result in the increase of health care costs. The national medical care costs for obesity-related illnesses is estimated at $209.7 billion. That is, an estimated 20.6% of U.S national health expenditures spent on the treatment of obesity-related illnesses (Cawley & Meyerhoefer, 2012). The added costs and the pervasiveness of this problem make developing effective interventions of great importance.

Many of the negative side effects related to obesity can be combatted with the introduction of healthy behaviors. Engagement in regular physical activity is one of the most important steps one can take for his or her overall health. Some of the benefits of

physical activity include weight control, reduction in chronic diseases, improvement of mental health, increased life expectancy, and stronger bones and muscles (Centers for Disease Control and Prevention [CDC], 2015).

Physical Activity

Despite the well-documented evidence regarding the benefits of physical activity, most Americans do not meet the recommended amount of physical activity (Centers for Disease Control and Prevention [CDC], 2014). The 2008 Physical Activity Guidelines for Americans recommends that adults should get at least 150 minutes a week of moderate-intensity, or 75 minutes a week of vigorous-intensity physical activity (U.S. Department of Health and Human Services, 2008). Numerous approaches including the 2015, *Step It Up! The Surgeon General's Call to Action to Promote Walking and Walkable Communities*, have been issued to promote and increase walking in the United States. As one of the most common forms of physical activity, walking can be a good first step for anyone who wants to become active, as it has lower rates of injury compared to higher intensity activities (U.S. Department of Health and Human Services, 2008, 2015).

Pedometer

Formerly, questionnaires, diaries, self-reports, or simple pen and paper have been used to measure physical activity. These types of measures can lack sensitivity, social desirability, and may suffer from recall ability, particularly for light or moderate intensity activities (Marshall, 2007; Schneider, Crouter, & Bassest, 2004). Insufficient measures have led to the use of permanent product recording systems, such as pedometers (Normand, 2008; Tudor-Locke et al., 2011). Pedometers can be small mechanical devices, designed to be worn on the body, and used to measures steps or distance

(Bassett, Mahar, Rowe, & Morrow, 2008). Early studies have found that variables such as the brand, the individual's waist circumference, BMI, and stepping rate could impact the pedometers' accuracy (Crouter, Schneider, Karabulut, & Bassatt, 2003; Melanson et al., 2004; Schneider et al., 2004), but newer models have shown to be more accurate (Schneider et al., 2004).

In recent years, pedometers have been gaining credibility as a more accurate quantification of physical activity because they can objectively measure physical activity, can be sensitive to subtle changes, and can be cost effective (Marshall, 2007). These devices can record and store real-time data, provide more immediate feedback, and improve the researchers' ability to monitor the subjects' behaviors (Marshal, 2007). Because pedometers can provide immediate feedback (Marshall, 2007), they have been used to increase calorie expenditure (Donaldson & Normand, 2009), running distance (Wack, Crosland, &Miltenberger, 2014), daily walking (Moreau et al., 2001), and to set goals (Tudor-Locke, 2002).

Some of the research featuring a pedometer included a "blind" phase, in which the device was covered, not allowing participants to receive feedback (Donaldson & Normand, 2009; Hultquist, Albright, Thompson, 2005; Normand, 2008). However, researchers found that covering the pedometer created a social desirability and reactivity bias (Marshall, 2007), suggesting that participants would prefer for the pedometer to be uncovered, allowing them to receive feedback from the device. In the research conducted by Donaldson and Norman (2009), only three of five participants were returned to baseline conditions. Two participants withdrew from the study when they were informed the monitor would again be covered. The three participants which whom participated in

the reversal, were quickly returned to intervention when they reported they would withdraw unless the monitor was uncovered.

Goal-Setting

A goal is the object or aim of action, in which an individual directs their effort towards (Weinberg, 2013). Generally, the intent of a goal is to achieve a specific level of proficiency on a task, within a set time limit (Ward, 2011). Goals can vary in type and in levels of specificity of what they are trying to accomplish (Locke, Shaw, Saari, & Latham, 1981). Goals are normally delivered in statements such as, "I will improve my pass accuracy by 10-20%."

The strategy of goal setting has been recognized as a useful method for evoking behavior change in industrial and organizational settings (O'Hora, and Maglieri, 2006; Reber, Wallin, & Chhokar, 1990; Tammemagi, O'Hora, & Maglieri, 2013), education settings (Alitto, Malecki, Coyle, & Santuzzi, 2016; Duncan, Dufrene, Sterling, & Tingstrom, 2013; Moore, Prebble, Roberston, Waetford, & Anderson, 2001), sport and exercise (Brobst & Ward, 2002; Mellalieu, Hanton, & O'Brien, 2006; Wack et al., 2014), and within the health realm (Dubbert & Wilson,1984; Strecher et al., 1995).

Due to the overwhelming concerns regarding obesity, copious amounts of research have examined and utilized goal-setting procedures to target and increase physical activity levels. Researchers have done so by setting goals such as 10,000 steps a day (Schneider, Bassett, Thompson, Pronk, & Bielak, 2006; Lindberg, 2000), increasing performance 5% per week (Cronteau, Richeson, Farmer, Jones, 2007), 10% biweekly (Prochaska, Hall, Humfleet, Munoz, Reus, Gorecki, Hu, 2008), or 20% monthly (McMurdo, Sugden, Argo, Boyle, Johnston, Sniehotta, Donnan, 2010). These studies

successfully increased physical activity; however, various methods were used to increase the target behavior, suggesting there is no goal standard.

In addition, the effects of goal-setting have been analyzed alone (Mellalieu, Hanton, & O'Brien, 2006), by goal levels (Baron & Watters, 1981), and in conjunction with other strategies (Brobst & Ward, 2002; Donaldson & Normand, 2009; Normand, 2008; Smith & Ward, 2006; Wack et al., 2014). In previous research, goals have been set by the participant (Donaldson & Normand, 2009), Mellalieu et al., 2006; Wack et al., 2014), or by the researcher (Normand, 2008; Smith & Ward, 2006), pre-established goal criterion (Brobst & Ward, 2002; Donaldson & Normand, 2009; Smith & Ward, 2006), goal stages (Mellalieu et al., 2006), short-term and long-term goals (Wack et al., 2014), or an average calculation (Normand, 2008).

In similar studies, Donaldson and Normand (2009) and Normand (2008), examined goal-setting along with self-monitoring and feedback. Normand (2008) used goal-setting in the form of daily step goals, which were established by calculating the average number of steps taken per day during the previous week and setting the new goal using that daily average. Donaldson and Normand (2009), showed their participants their baseline data and had them set their own goals at 10% above their daily average during baseline. In both studies, the participants' goals were increased, decreased, or held constant based on their performance.

Even though the two studies found goal-setting to be an effective strategy to increase steps, both studies had methodological limitations due to the research designs selected. The reversal design, utilized in both studies, is subjected to irreversibility and social considerations. For some behaviors, the effects of an intervention, once presented,

cannot be withdrawn, as was the case for the Donaldson and Normand (2009) participants, whose behavior did not reverse to baseline levels when the baseline condition was reintroduced. For one participant, the target behavior did not return to initial levels because he maintained a consistent workout routine throughout the phases. One possible explanation for this failure to achieve a reversal was that while in the initial intervention phase, he developed a history of monitoring the calories expended, which could have impacted his behavior when the heart rate monitor was removed. Additionally, procedural integrity was compromised when two participants withdrew from the study when they were told the monitor would be covered and the three participants that were in the reversal stated they would withdraw if they were not returned to the intervention phase. The current study addresses these issues by utilizing a range-bound changing criterion design, which does not feature a reversal to baseline.

Performance Feedback

Previous research suggests that together, goal setting and performance feedback are two of the most implemented and most studied strategies for enhancing performance in sports (Locke & Latham, 2002; Ward, 2011). Performance feedback serves the purpose of providing information which allows the individual to alter, improve, or maintain their performance. Furthermore, individuals need regular feedback and encouragement regarding accuracy and progress of goals, for effective behavior change to occur (Locke & Latham, 2002).

Throughout the literature, various forms of performance feedback have been utilized such as behavioral coaching (Stokes, Luiselli, & Reed, 2010), public or private posting of performance (Anderson, Crowell, Doman, & Howard, 1988; Brobst & Ward,

2002; Smith & Ward, 2006), and verbal descriptions or graphic displays (Ward, 2011). Performance feedback can be posted on a chart or graph visible to participants (Brobst and Ward, 2002; Donaldson & Normand, 2009; Normand 2008; Smith & Ward, 2006; Wack et al., 2014), with or without names or identification numbers (Brobst & Ward, 2006; Smith & Ward, 2006) used in combination with other strategies (Brobst and Ward, 2002; Donaldson & Normand, 2009; Normand 2008; Smith & Ward, 2006; Wack et al., 2014), provided at each meeting (Brobst & Ward, 2008; Smith & Ward, 2006), or weekly (Donaldson & Normand, 2009; Normand 2008; Wack et al., 2014), by the researcher (Donaldson & Normand, 2009; Normand 2008; Wack et al., 2014), or by the coaches and researchers (Brobst & Ward, 2002; Smith & Ward, 2006) to evaluate performance for the week. Instead or along with weekly meetings, some researchers provided performance feedback via email (Donaldson & Normand. 2009; Normand, 2008). Overall, these studies found that the target behavior increased with performance feedback, regardless of type.

Changing Criterion Design

The changing criterion design is a within-subject research design that was first applied by Weis and Hall in 1971 (Hartmann & Hall, 1976). Since then, McDougall (2013) adapted, named, and applied two deviations of the classic changing criterion design; termed the range bound criterion design and distributed criterion design. The range bound criterion design differs from the original in that it establishes both a lower and upper criterion, within each stepwise phase. The lower and upper criterion form a bounded range of performances, a minimum or floor level and a maximum or ceiling level. In addition, each subsequent phase is based on a criterion of the set goal, ensuring

the standards are met before moving on to the next phase. Thus, creating a gradual and systematic approach to reaching a goal (Hartmann & Hall, 1976).

Experimental control is demonstrated when the target behavior consistently falls within the specified range. If the target behavior does not conform to the specified range, experimental control is compromised. Compared to the traditional changing criterion design, the target behavior needs to match or take the place of the single criterion. However, when a target behavior supersedes a single criterion by a substantial amount, it may be difficult to provide definitive conclusions of experimental control. When compared, the range-bound changing criterion design provides a means for a more definitive conclusion about experimental control than the original version (McDougall, 2005).

In the first application of the range-bound changing criterion design, submitted by McDougall (2005), an overweight, adult male used this approach to systematically and gradually increase the duration of daily running. Following this design's first application, it has been successfully employed to examine the effects of goal-setting (De Luca & Holborn,1992; Donaldson & Normand 2009; Kurti and Dallery, 2013; Wack et al., 2014), and after school programming on physical activity among adolescents with visual impairments (Cervantes & Porretta, 2013). Each of these studies found that the range-bound changing criterion design gradually and successfully shaped the target behavior.

The range- bound changing criterion design is beneficial for any problems that target a stepwise increase in accuracy, duration, latency, frequency, or magnitude (Hartmann & Hall, 1976), which are measures that are commonly selected, examined, and used when employing goal setting procedures. As demonstrated in previous work,

there appears to be a strong relationship between the range-bound changing criterion design and goal-setting interventions. Particularly for studies that incorporate a sequence of short-term objects with corresponding criteria, which aim to improve future performance, in a step-wise fashion, based on a person's current performance to achieve a long-term goal (McDougall, 2013).

The Current Study

The pervasiveness of obesity has placed a high demand on interventions that help combat this widespread epidemic. More recently, there has been a push by the U.S. Department of Health and Human services to increase physical activities levels, suggesting walking as the key activity (U.S. Department of Health and Human Services, 2008, 2015). Thus, countless research has been devoted to target healthy behaviors and to increase physical activity. Among the many strategies, goal setting and performance feedback have stood out as exceptional tools for behavior change. Although a plethora of studies have shown that goal-setting and performance feedback can functionally increase performance in a variety of settings, all suggest that there is room for further investigation of these mechanisms at work. This study added to the current literature on goal-setting and performance feedback, while addressing some of the limitations noted in the previous research. A procedural limitation that warrants attention is the selection of the research design used to evaluate the target behaviors. In the reviewed literature, the multiple-baseline and reversal design have been the most frequently applied single-subject research designs. Applying the reversal design can be problematic because withdrawing an effective intervention can pose some social and scientific considerations. The multiple-baseline design is limited in that experimental control is not always clearly

demonstrated, it requires delayed treatment, and it can be pricey (Cooper, Heron, & Heward, 2007). The current study omitted some of the above limitations by employing a range-bound changing criterion design, which has many methodological benefits. First, this design does not require a reversal to baseline or withdrawal of a treatment intervention. Second, experimental control can be easily identified by visually analyzing the data. Third, the upper and lower limits defined within each phase, create and allow for participants to gradually and safely increase their physical activity levels without having excessive changes in behavior that could lead to injury. Moreover, research should further investigate the use of the range-bound changing criterion design to answer socially valid questions in the health domain.

Furthermore, this study addressed social validity concerns by providing questionnaires at each weekly meeting to obtain measures of participant's satisfaction, which was not a common theme in the previous literature. This study featured a pedometer that could be plugged into a USB port that instantly downloads and records the data to the linked account. Once downloaded, the site generated a graph based on the data, allowing for visual analysis and inspection by the student author. Using a pedometer that records, stores, and electronically upload data is beneficial in that participants do not have to record their own data, negating recall biases. Therefore, the purpose of this study is to examine the effects of goal setting and performance feedback on steps of adults.

Research Questions

What are the effects of goal-setting combined with performance feedback with a pedometer on daily steps taken for adults?

Does the range-bound changing criterion design effectively increase walking for adults?

CHAPTER 2

METHOD

Participants

Three adults were recruited via flyers posted in the Delaware County community. Flyers were posted by the student author in gyms, grocery stores, and libraries. Participants contacted the student author using the information provided on the flyer. All participants were healthy adults who wanted to increase their daily physical activity. Per inclusion criteria, participants were selected if they were in good health and did not have any health conditions that would create potential health risks, as indicated by the Physical Activity Questionnaire (See Appendix C). Dorothy was a 28-year-old female who worked from home and spent most of her day at her desk. Dorothy was not on a regular physical activity routine, but had previously used a pedometer. Dorothy set her long-term goal as an average of 40,000 steps per week. Rose was a 28-year-old female who worked in an office. Rose's job was mainly confined to a desk, with intermittent days in the field. Rose's physical activity included walking when giving tours at work, walking on the treadmill at the gym, and walking her dog. Rose had previously owned a pedometer but was not regularly wearing the device. Rose set her long-term goal as an average of 30,000 steps per week. Blanche was a 33-year-old female who worked from home and rarely left her house apart from business trips. Blanche's physical activity included walking around her four-story house when on business calls. Blanche had never owned or used a pedometer before the study. Blanche set her long-term goal in terms of steps per day. Blanche's original long-term goal was set at an average of 6,000 steps, but was changed to an average of 10,000 steps per day, when she met her first long-term

goal. Blanche selected her new long-term goal. All information was gathered via intake questionnaire (See Appendix B) at the initial meeting.

Settings

All steps during baseline and intervention were recorded in participants' natural environments. This included work, gym, parks, and community. Participants were instructed to wear their pedometers from when they woke up to when they went to bed. During baseline and intervention phases, Dorothy's natural settings included her home and small walks around her neighborhood when she walked her dog. Rose's natural settings were her house, work, gym and parks. Blanche's natural settings were various locations of her house and occasional traveling.

Weekly Meetings

All weekly meetings were held at a Delaware County coffee shop that had free access to Wi-Fi. Participants were required to bring their pedometer to the weekly meetings. At the weekly meetings, participants were required to fill out a weekly meeting questionnaire (See Appendix D).

Materials

Scale

An EatSmart Precision digital bathroom scale was used to weigh all participants. The scale had extra-large lighted display and "Step-On" Technology. Four high precision sensors ensured consistent and accurate measurement up to 400 pounds. The scale was constructed of thick 8mm tempered glass and measures 12" x 13" platform and sits 1.8" off the ground.

Pedometer

The Omron HJ-323 Alvita USB Pedometer is designed to tracks steps, aerobic steps, average number of aerobic steps per minute, distance walked and calories burned. For this study, the pedometer was used to track each participant's steps daily. This pedometer can keep an accurate step count in a flat, vertical or horizontal position. The USB feature allows for transfer of data to a OmronWellness.com account. The pedometer displays current day's activity and stores for up to 21 days in the device and resets automatically at midnight for an accurate daily count. The pedometer measures 4.8 x 1.8 x 4.5 inches. The student researcher provided the pedometers along with the holder, strap with clip, CR2032 battery, screwdriver, and instruction manual. The Omron HJ-323 pedometer was chosen because of the many features it offers. The Omron pedometer is accurate, features smart sensor technology, and has a memory capacity of 21 days. This pedometer can measure steps, distance, calories, aerobic steps, pitch, and time. For this study, the pedometer was used to track each participant's daily steps. This pedometer can keep an accurate step count in a flat, vertical or horizontal position. The pedometer displayed time, the participants weight, height, and stride length. The USB feature allowed for data transfer to a OmronWellness.com account.

Surveys, Questionnaires, And Scales

Flyer

A one-page flyer, developed by the student researcher, was distributed to various locations in the Delaware county area. The flyer provided a brief synopsis of the research study. The flyer featured a picture of people walking outside, brief details, and contact information for the researcher (See Appendix A).

Intake Questionnaire

An intake questionnaire, developed by the researcher, was used to collect demographic information from participants. The questionnaire requested the participant's name, age, height, weight, and contact information (See Appendix B).

Physical Activity Readiness-Questionnaire

Following the intake questionnaire, participants filled out the physical activity readiness-questionnaire. The PAR-Q (Canadian Society for Exercise Physiology, 2002) was the survey used to determine whether a potential subject could safely increase their level of physical activity (See Appendix C). The one-page questionnaire asked seven health-related questions as to whether a potential participant had any health conditions that would inhibit them from participating in physical activity. Individuals were selected if they answered "no" to all questions.

Weekly Meeting Questionnaire

At each weekly meeting, participants answered six, open ended questions. The brief questionnaire featured opinion based questions related to the study. The participants were provided with writing utensils to complete weekly meeting questionnaire (See Appendix D).

Dependent Variable

The dependent variable was the number of steps. A step was defined as any activity that resulted in a count being registered and displayed on the pedometer. Steps were recorded on an Omron HJ-323 Alvita USB pedometer. The Omron HJ-323 pedometer calculated steps based on participant's stride length and step counts started at midnight of each day.

Dependent Measures

Data were collected throughout baseline and intervention phases. Data were collected by a permanent product recording system. The dependent variable, steps, was recorded using the Omron HJ-323 Alvita USB pedometer. The participants were given a pedometer, a holder clip, a CR2032 installed battery, a screwdriver, and an instruction manual. The pedometer was introduced, explained, and configured to each subject's specifications at their first meeting. The participants were instructed to wear the pedometer on their clothing during waking hours, for the duration of the study. In addition, body weight was recorded for each participant prior to intervention and again at the end the study.

Independent Variables

The independent variables in this study were goal-setting and performance feedback.

Goal-Setting

Short-term goals were set by the participant and the student researcher. Long-term goals were set by the participant. Participants goals were adjusted or held constant based on step performance. All goals were documented by the student author and secured on password protected laptop.

Each participant was also provided a written document of their short-term and long-term goal. This provided the participants with a hard copy of their long-term goal, previous short-term goal, and current short-term goal.

Short-Term Goals

Weekly step goals were established by calculating the mean number of steps taken during the previous week and setting a new goal range of +/- 10%, of the mean. The

equation, (*M* +/- 10%) was used to calculate the short-term goal for only two participants, and only for a brief period. Dorothy was under the range-bound changing criterion design for 4 weeks and Rose was under the range-bound changing criterion design for 3 weeks until the design was altered. Blanche was the only participant which whom the traditional changing criterion design was implemented throughout their entire study. Once the traditional changing criterion design was implemented, the equation for short-term goals was switch to + 10% of the mean steps per week.

For a participant to increase their short-term goal, his or her daily steps had to fall within inside of his or her +/- 10% range, 5 out of 7 days of the week. Once the goal criterion was met, the participant continued to establish new, increasingly higher criteria. Each intervention phase used use the same formula, (*M* steps= +/- 10%) throughout the study. The range of +/- 10%, within each intervention phase, indicated how many steps the participant aimed to walk, per criteria established via goal-setting. If a participant did not meet his or her current goal criteria, his or her short-term goal remained at the same criterion range for the subsequent week. If a participant did not make their weekly step goals two weeks in a row, the participant was given the option to decrease their step goal. None of the participants selected the option of decreasing their step goal.

Long-Term Goals

Long-term goals were set by the participant with the student author, in the beginning of the study. They had the option of setting their goal as a number or an average number of steps he or she aimed to walk, in a week, by the conclusion of the study. Long-term goals had the option of being modified by the participant at any time throughout the study.

Performance Feedback

Participants received feedback at each weekly meeting. Feedback was in the form of descriptive performance assessment based on their step outcomes for the week. All participants received verbal praise or words of encouragement, dependent on their goal outcomes. For example, if a participant reached their goal, they received a verbal statement such as, "Great job! Keep up the good work." If a participant did not meet their goal, they received words of encouragement such as, "You can do it next week." All feedback was given by the student author. In addition, visual feedback in the form of a graphical display was shown to all participants. This was accomplished by plugging in the participant's pedometer to the student author's personal computer. The participant logged into his or her own personal Omron wellness account, plugged the pedometer into the USB port, and their weekly results uploaded. Once uploaded, the participant's steps for each day were displayed in a bar graph. On the bar graph, the X-axis displayed the date and the Y-axis displayed the number of steps taken. Feedback consisted of the student author commenting on the direction of the data points, pointing out the trends, providing praise for increased activity, and encouragement to increase steps for the following week. If the participant met their current goal, a new short-term goal was set using the calculation *M* steps= +/- 10% or *M* steps + 10%, when the traditional changing criterion design was implemented. If a participant did not meet their goal, they kept their previous step goal.

Experimental Design

The range-bound changing criterion design and the traditional changing criterion design was used to evaluate effects of goal-setting and performance feedback. The range-

bound changing criterion design was only utilized for a brief period by two participants. The design was switched in the 4th week of intervention for Dorothy and the 3rd week of intervention for Rose.

Procedure

Baseline and intervention data were collected on the target behavior for each participant in his or her natural environment.

Baseline

During baseline, all participants wore the Omron pedometer but did not set short or long-term goals. All recordings of steps occurred in the subject's day-to-day natural environment. Baseline data were collected for 1 week. After baseline, the first weekly meeting was held between the student author and each participant. In this meeting, the student author plugged each participant's pedometer in the computer to uploaded their weekly step results. The participant was not provided any feedback or allowed to see their graphed results during baseline. While the participant was in front of the student author, unable to see the computer screen, the student author calculated the participant's mean average of steps for that week. Using the calculation, M steps = +/- 10%, the goal range was set for the next week. The participants could see the calculations being done. During this initial meeting, the student author also took the participants weight using the EatSmart Precision digital bathroom scale. The student author recorded the participant's weight on a separate paper. Participants were allowed to see their weight.

Prior to baseline, each participant individually met with the student author for an introductory meeting. In this meeting, the student author gave each participant a pedometer, explained how it worked, demonstrated how to operate, and calibrated the

pedometer to the participant's specifications. Specifications included the time, participant's weight, height, and stride length. The method to calculate stride length was as follows: walk 10 steps with normal stride, measure distance from start to end in inches, calculate your stride by dividing the total distance by 10. This number was then converted into inches and registered in the pedometer under the stride length setting. Each participants' weight was taken prior to baseline and again at the completion of the study.

Intervention

Following baseline, the participant aimed to meet their step goal 5 out of 7 days. To meet their goal, their step count for the day had to fall inside of their predetermined range. All goals and performance feedback were set at the weekly meetings. The student author met individually with each participant, ensuring that personal information was not shared. At the meeting, the participant plugged their pedometer into the computer and entered their own login information, while the student author was turned around and could not see it being entered. After the participant logged in, the student author made sure that if the computer asks to save the information they clicked "no."

When plugged in, the pedometer automatically transferred their step data to their account and updated their graphs. During the intervention phases, the participants could see his or her graphs and was provided feedback based on his or her step results. If the participant met his or her step goal for the week, they were given verbal praise by the student author. If he or she did not meet the current goal, they were given words of encouragement such as, "you can do it next week," or "keep working, I know you will reach your goal next week." Both verbal praise and words of encouragement" were scripted and pre-planned beforehand. If the participant met their goal, a new short-term

goal was set for the next week. If they did not meet their goal, they kept the same goal, until the goal was achieved. Each participant was asked to fill out a weekly meeting questionnaire at the end of the meeting. The student author kept these records.

Discontinuation of Range-Bound Changing Criterion Design

The range-bound changing criterion design was discontinued during the 4th week of intervention for Dorothy and the 3rd week of intervention for Rose. This design was discontinued because the participant's steps were not falling within the pre-determined range. For both Dorothy and Rose, their steps were falling above the minimum but also above the upper limit. Even though their steps were increasing, they were not within the lower and upper limit, thus not meeting their short-term goals. Due to this, the research design was switched to the conventional changing criterion design. Instead of a lower and upper criterion, the traditional design features a single criterion within an intervention phase. Also, there was not risk that participants would go above to a number of steps that would likely cause injury.

Procedural Fidelity

A checklist was used to assess the accurate implementation of experimental procedures (See Appendix E). An independent observer was trained to collect data prior to the start of the study. Training included a review of the measurement system, how and what to measure, as well as a practice session. The checklist included eight yes or no questions pertaining to the procedures. Procedural Fidelity was taken on 41% of all sessions and 100% of the steps were implemented correctly.

Social Validity

Social validity was assessed via questionnaire following the conclusion of the study (See Appendix F). The social validity questionnaire included 10 ranking questions, one opened ended question, and two yes or no questions. The questions evaluated the participants' opinions of the study and how the procedures were implemented. The first 10 questions asked the participant to rank in order of relevance, with one being most important. The ranking questions were based on baseline, intervention phases, methods, and procedures used throughout the study. Each question was followed by an optional notes section. The opened ended question asked whether they would recommend this study to others. The two yes or no questions were based on the participant's continuation of these interventions once the study ended.

CHAPTER 3

RESULTS

Overall, weekly average step goals for each participant increased following the introduction of performance feedback and goal-setting. Despite the increase, each participant's daily steps were variable and did not closely correspond with their set goals. Therefore, experimental control was not demonstrated through the range-bound changing criterion design. However, when the design was switched to the traditional changing criterion design, some experimental control was demonstrated, particularly for Blanche who completed the study all the way through with the traditional changing criterion design.

Dorothy

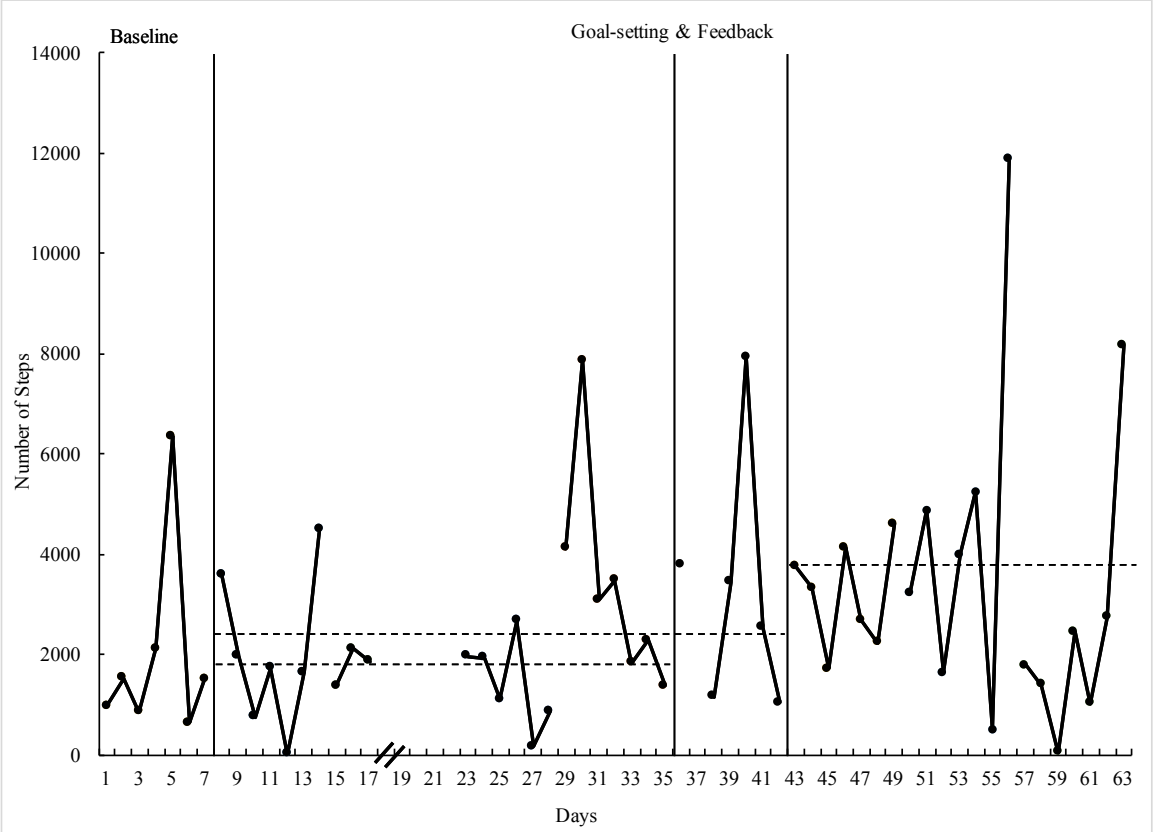

Figure 1. Displays Dorothy's steps per day across baseline, intervention, the range-bound changing criterion design and the changing criterion design. The two dashed horizontal lines represent the lower and upper criterion of their short-term goal, utilizing the range-bound changing criterion design. The single horizontal dashed line indicates the short-term goal utilizing the changing criterion design.

Dorothy's mean number of steps during baseline was 1,991 steps and her mean number of steps during all of intervention was 2,870, this was a 44% increase. Her steps ranged from 633 to 6,353 in baseline, from 7 to 11, 884 in intervention, and from 7 to 11,884 overall. Dorothy was the only participant to show some immediacy following the onset of the intervention from baseline. However, percentage of non-overlapping data (PND) was only 7%. Percentage of non-overlapping data is not always an adequate measure of effectiveness if the data are likely to be trending. During the 2nd through 3rd week of intervention. Dorothy received a second pedometer after she washed hers in the washer, as displayed in the lapse of data indicated via scale break. Her short-term goal was then met during the 5th week of intervention despite having only 6 data days possible. Her short-term goal was altered to meeting her step goal 4 out 6 days. Visual analysis of figure 1 suggests there was little correspondence between application of the range-bound changing criterion design and increased number of steps. Dorothy's steps only fell within the pre-determined range five times in 4 weeks. However, when the traditional changing criterion design was implemented, Dorothy immediately met her goal. During the last three phases, Dorothy's steps increased by 72.1%. However, Dorothy did not meet her long-term goal of an average 40,000 steps a week.

The social validity questionnaire revealed that Dorothy thought the study was fun, easy, and helped her to see how much she walked. Dorothy reported that her most important reason for participating in the study was becoming physically active. Dorothy expressed that the baseline was explained well and that the weekly meetings were helpful. She also reported that the Omron wellness site was easy to use. In terms of the outcomes of the study, Dorothy stated that being more active was the greatest benefit of being a part of the study, followed by having more energy. Dorothy disclosed that she would suggest this study to others and she would continue using the pedometer.

Rose

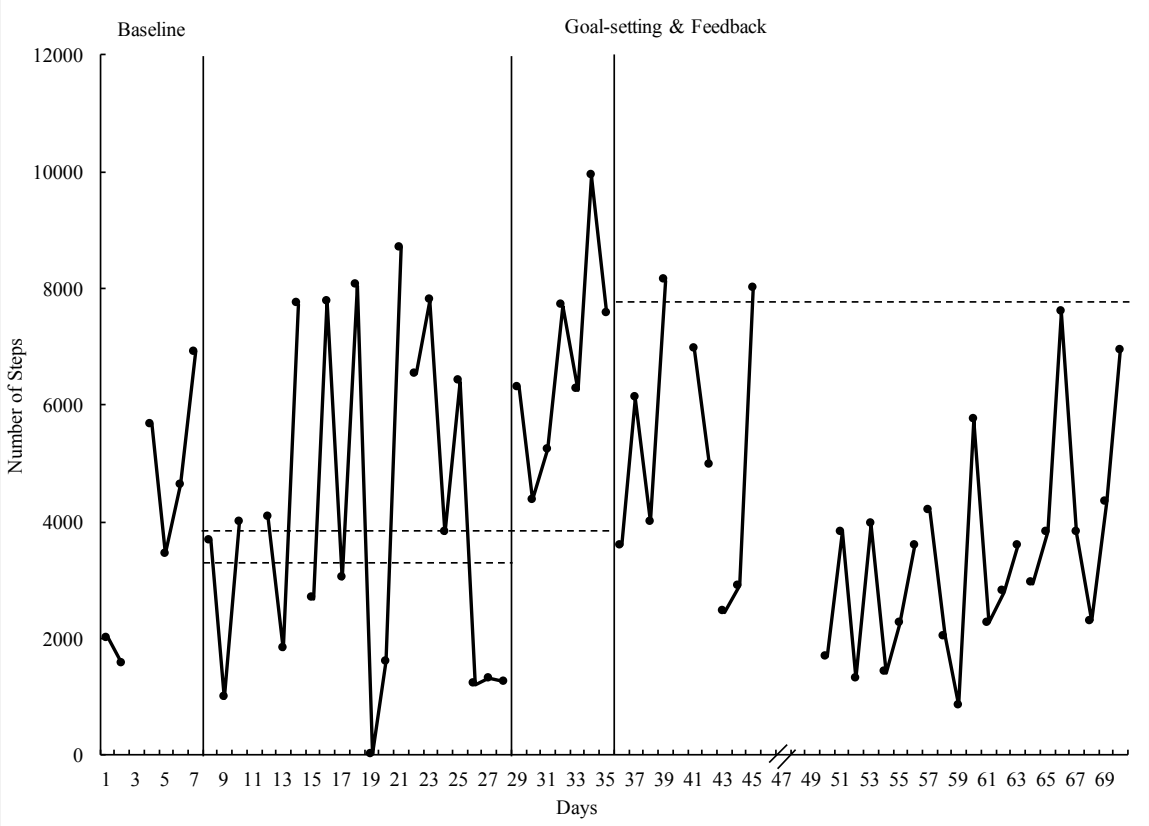

Figure 2. Displays Rose's steps per day across baseline, intervention, the range-bound changing criterion design and the changing criterion design. The two dashed horizontal lines represent the lower and upper criterion of their short-term goal, utilizing the range-bound changing criterion design. The single horizontal dashed line indicates the short-term goal utilizing the changing criterion design.

As displayed in Figure 2, Rose's mean number of steps during baseline was 3,446 and her mean number of steps during all of intervention was 6,975, an 102% increase overall. Rose's steps ranged from 1,574 to 6,920 in baseline, from 25 to 9,933 in intervention, and from 25 to 9,933overall. However, percentage of non-overlapping data (PND) was only 14%. During the 6th week of intervention, Rose lost her pedometer as shown by lapse of data displayed in Figure 2. via scale break. Visual analysis shows there was little to no experiment control demonstrated for Rose. When the range-bound changing criterion design was implemented Rose's steps only fell within the pre-determined range twice in 3 weeks. Rose met her short-term goal in the 5th week of intervention, immediately following the change in research design. Rose's short-term goal went from 3,812 steps to 7,448 steps, a 95% increase. Rose met her long-term goal, 30,000 steps per week, on four occasions. Although there was an increase in the short-term, Rose's steps were variable and did not correspond with the application of the traditional changing-criterion design. Therefore, experimental control was not demonstrated for this participant.

Overall, the social validity questionnaire revealed that Rose enjoyed participating in the study. In the open-ended question, Rose conveyed that people in her field do not realize how little they move even on a busy day. Rose's first reason for joining the study

was to lose weight, followed by becoming more physically active. She stated the baseline phase was explained well, she liked the methods used to set goals, and found the pedometer and Omron wellness account easy to use. The benefits of the study, stated by Rose, were a healthier lifestyle and being more active. In the open-ended section, Rose expressed that her goal was to increase her overall steps, and to feel less tired after work. As a result, she walks more now and feels more physically active.

Blanche

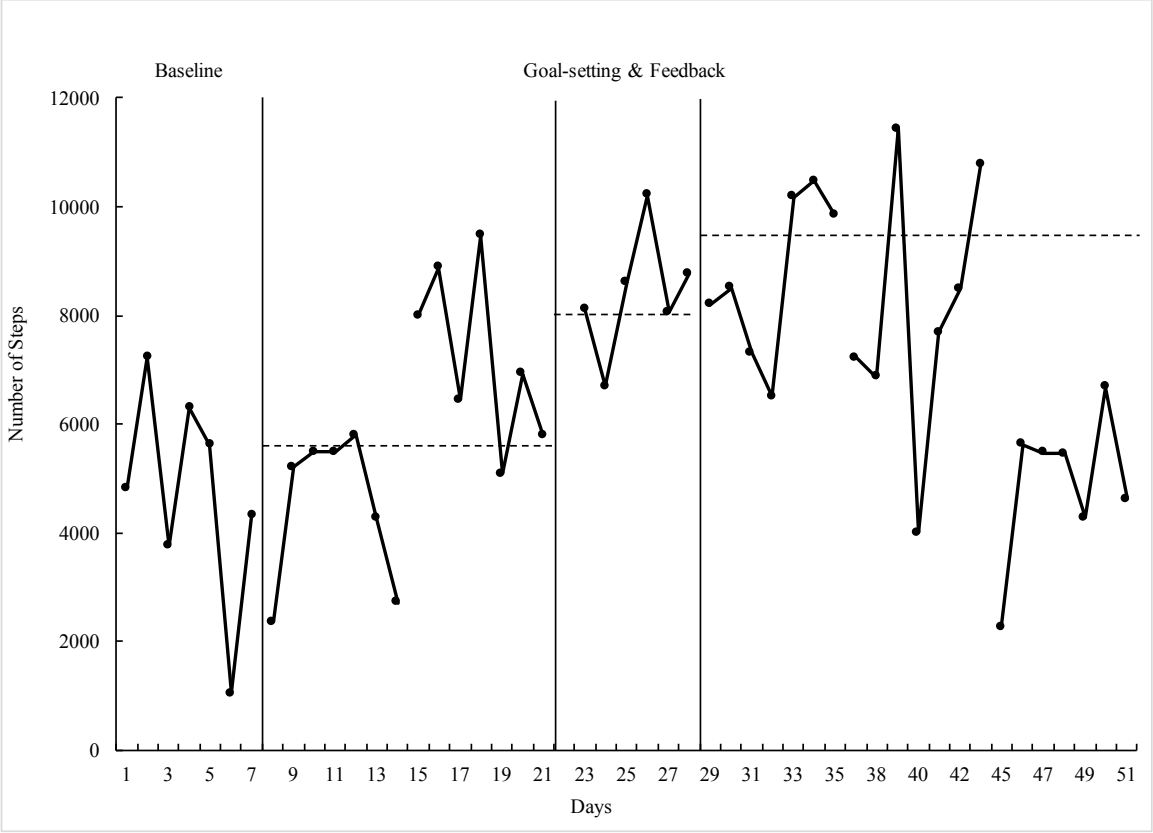

Figure 3. Displays Blanche's steps per day across baseline and intervention weeks. Dashed horizontal lines indicate the short-term goal.

As displayed in Figure 3, Blanche's mean number of steps during baseline was 4,733, her mean number of steps during all of intervention was 6,930, an increase of

46%. Her steps ranged from 1,052 to 4,824 in baseline, from 2,239 to 11,428 in intervention, and from 1,052 to 11,428 overall. Percentage of non-overlapping data (PND) was 37.5% for this study. Blanche met her first long-term goal of an average of 6,000 steps a week, but not her second long-term goal of 10,000 steps per week. Visual analysis of Figure 3. suggests that there was some experimental control demonstrated through the changing criterion design. Blanche's data show an increasing trend following the implementation of goal-setting and performance feedback. Apart from the final week of intervention when Blanche had a decreasing trend. Blanche met her short-term goals in the 3rd and 4th weeks of intervention.

Blanche reported in the social validity questionnaire that she enjoyed participating in the study. Her main goal for participating in the study was to become physically active and to relieve stress. Blanche stated in the open-ended section that she knew she did not walk a lot working from home, and was unaware of how inactive she was until her steps were measured. Blanche reported that her most important reason for joining the study was to become physically active followed by stress relief. Blanche disclosed that she liked how the feedback was delivered, liked the methods used to set goals, and found the weekly meetings helpful. Blanched noted that being more active and a healthier lifestyle overall were the greatest benefits of the study. She circled "yes" when asked if she would continue with the program once the study ended.

CHAPTER 4

DISCUSSIONS

All three participants increased their average number of steps from baseline to the final week of intervention. Dorothy averaged a 44% increase, Rose averaged a 102% increase, and Blanche averaged a 46% increase of steps from baseline through intervention. However, the degree of change in steps per day varied from baseline through intervention, and the data for each participant were relatively variable from day to day. Overall, the current study demonstrated weak experimental control. There was little to no correspondence between increased steps and the range-bound changing criterion design. Therefore, experimental control was not demonstrated through the range-bound changing criterion design. However, when the traditional changing criterion design was applied, some experimental control was demonstrated, particularly for Blanche. Additionally, ensuring the phase changes were varied in length, magnitude, and a reversal to a previous criterion would have increased the likelihood of experimental control (Cooper, Heron, & Heward, 2007).

The purpose of this study was to evaluate the effects of goal-setting and performance feedback, using a pedometer, on daily steps of adults, as well as examining if the range-bound changing criterion design effectively increases walking for adults. While past studies have shown that the combination of goal-setting and performance feedback are effective in enhancing performance (Locke & Latham, 2002; Ward, 2011), some found methodological limitations due to the chosen research design (Donaldson & Normand, 2009; Normand, 2009). The author utilized the range-bound changing criterion

design, suggested as a recent innovation in rehabilitation research by McDougall et al. (2005).

Results of the current study indicate that the range-bound changing criterion design was not successful in increasing steps taken by adults. The range-bound changing criterion design was only applied to Dorothy and Rose, for a duration of 3 and 4 weeks. Visual analysis for both participants suggest there was little to no correspondence between the range-bound changing criterion design and a consistent increase in number of steps. While Dorothy's and Rose's steps increased, their data did not fall within the lower and upper criterion for each condition, thus not meeting their step goals. These results may be skewed because of Dorothy and Rose losing their pedometers. Both Dorothy and Rose reported, in the weekly meeting questionnaire, they were happy their steps were increasing but it was frustrating they were not meeting their short-term goals. As a result, the switch was made from the range-bound changing criterion to the changing criterion design. Following this change, Dorothy and Rose immediately met their short-term goal. The changing criterion design was implemented throughout all phases for Blanche, who met her goal more times than Dorothy and Rose. Setting an upper limit in the range-bound changing criterion design would be beneficial to reduce risk of injury when the dependent variable is of higher intensity, such as running. When the physical activity is less strenuous like walking, it is unlikely that exceeding the upper limit would result in injury. In the current study, goals were increased by 10% of the average step total of the previous week. However, an empirically established standard for setting goals does not exist. Future research should evaluate the standards for setting goals.

Pedometers

All statements made regarding the pedometer, by the participants, were given in the weekly meeting questionnaires and in the social validity questionnaire. All participants reported in the weekly meeting questionnaire and social validity questionnaire that the Omron pedometer was easy to use and they could successful operate its settings. Dorothy stated in the weekly meeting questionnaire that it took time to get used to and that they had trouble positioning the pedometer on certain styles of clothes, such as dresses. Dorothy also stated that she liked wearing the pedometer, that at times she did not notice she was even wearing it, and that it made her feel accountable for walking. Rose expressed in the weekly meeting questionnaires that she liked the pedometer a lot, more so than other pedometers she has worn prior to the current study. Rose also reported having difficulty with positioning the pedometer on certain styles of clothing. Blanche reported that she liked the pedometer and that it was easy to use, but had some difficulty keeping the pedometer on the clip.

Pedometers are a popular and widely-used tool to track and record physical activity (Schneider et al., 2004). Interestingly, the findings of this current study do not support the current popularity of pedometers as effective devices to increase steps. One can be given a pedometer but that does not mean he or she will become automatically active and increase their physical activity, as baseline data shows.

Performance Feedback

Previous studies have shown that performance feedback, provided by the research, was an effective strategy to increase target behavior (Donaldson & Normand, 2009; Normand 2008; Wack et al., 2014). All participants reported in the weekly meeting

questionnaires and social validity assessment that seeing their graphed results was beneficial, whether they met their goal or not. When they did not meet their goal, all participants stated that they should have walked more or could have done better, when looking at their graphs. Particularly, Blanche reported she could tell the days when they had more conference calls versus days when she did not. When the goal was met or steps were high, all participants stated they were excited to see their graphs and were happy to see their progress. This relates to the findings of Wack et al. (2014), who found delayed reinforcement in the form of feedback for goal accomplishment may influence attainment of the set goal.

Goal-Setting

Research indicates that goal-setting has been effective in various settings, on various target behaviors, and when combined with other interventions. Specifically, past research aimed to target and increase physical activity found goal-setting as a successful intervention (Croteau, Richeson, Farmer, Jones, 2007; Schneider, Bassett, Thompson, Pronk, & Bielak, 2006; Lindberg, 2000). The current study had participants set short-term goals and long-term goals. Suggesting that goal-setting procedures to which criterion levels are set to one's individual behavior (Brobst & Ward, 200) may act as an establishing operation to strengthen the reinforcing value of meeting one's goal (Miltenberger, 2012). If one sets a goal to walk a predetermined distance, he or she may be more likely to engage in the behavior that may put them in contact with a reinforcing consequence rather than one that will not produce reinforcement. However, similar to the findings of Normand (2008), participants failed to continuously reach their goals. This failure to regularly meet their goals suggest that there was no functional relation and

goal-setting was not a critical component. The addition of commitment responses and behavioral contracts could have increased the effectiveness of the intervention. Future research should incorporate and evaluate the use of commitment responses when increasing physical activity.

Modifications were made for Dorothy and Rose during the middle of the study. Neither Dorothy or Rose met their goals during the use of the range-bound changing criterion design. However, once the change was made from a bounded range criterion to a single criterion, both participants increased their goals. Blanche met her goal 2 out of the 6 weeks of intervention, only failing to accomplish her goal by 1 day on multiple occasions. The current data shows participants failed to meet their step goals, 5 out of 7 days a week, suggesting that short-term goals were not a critical component of the study. It is possible that the participants' day-to-day settings could have impacted meeting their goals. Two of the three participants worked from home and had a limited natural environment. Blanche reported she walked more on days she had conference calls because she paced around her house while talking. In addition, she should have walked more on days she did not have calls. Rose works most days in her office with a few exceptions when she gives tours. Rose stated she should have planned to walk after work on days she was at her desk all day. Setting a weekly average goal instead of meeting a daily goal may have increased the number of short-term goals met. This way participants could plan to compensate for days when they were in the office or not on calls. Although all participants did not regularly meet their goal performance each day, their weekly step averages increased.

CHAPTER 5

LIMITATIONS

One limitation of the current study was the research design selected. Experimental control and intervention efficacy are difficult to demonstrate when few data points conformed to the pre-calculated range of performance. The range-bound changing criterion design did not prove to have experimental control. A design such as the multiple baseline design may have been more appropriate for the current study.

Another limitation of the current study is the number of participants' and their settings. Two of the three participants worked from home and the third participant worked from their desk most of the day. The variation in daily routine could have differentially affected each participant's opportunity to exercise. However, in everyday life, individuals' opportunities to exercise varies and the point of the pedometer is to use performance feedback to overcome those variations. The methods employed in this study could have yielded different results for participants who are regularly active and do not work at home or from a desk. In addition, two of the participants lost their pedometers creating a lapse in data collection.

Pedometers are widely used tools to account and measure behavior. This current study utilizes the Omron pedometer as the dependent collection method. While all participants reported, they enjoyed using their pedometers via questionnaires, the amount to which they physically looked at their pedometer throughout their day was not recorded. The extent to which the pedometer affected the participants' behavior and steps was not analyzed in this study, apart from the goal-setting intervention. Suggesting future

research should analyze the extent of the user and pedometer relationship, varying the type of pedometer.

Future research should evaluate the effects of goal-setting and performance feedback for multiple physical activities and across all populations. Additionally, comparing the mechanisms of goal-setting and performance feedback individually, and when combined to increase physical activity would be interesting. Furthermore, there is no gold standard for establishing goals. The mechanisms to which goals are established and evaluated should be examined further. The use of commitment responses would be beneficial to evaluate when implementing goal-setting to increase physical feedback.

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APPENDIX A

RECRUITMENT FLYER

Are you getting enough exercise?

Looking for an easy way to track your fitness?

Participate in a zero-cost research study conducted by a Temple University graduate student. All participants will receive a **FREE pedometer** to track and analyze fitness goals.

To participate in the study:

- You must be 18 years or older
- Cleared for physical activity (walking)
- Have access to the internet
- Available for a brief meeting (1 per week)

Interested in participating or want more information?

Contact Emily Michael at (484) 326-9754 or **tug03984@temple.edu**

APPENDIX B

INTAKE QUESTIONNAIRE

Name: _____ Age: _____ Sex: _____

1: What county do you currently live in? _____

2: Have you engaged in any type of physical activity in the past year? (circle one):

Yes or No

3: Are you healthy enough and physically capable of walking for more than 30 minutes at a time? (circle one): Yes or No

4: Are you currently receiving ongoing medical treatment for any injury? (circle one):

Yes or No

5: In the last year has any medical professional told you not to engage in physical activity due to an injury or illness? (circle one): Yes or No

6: Have you been injured in the last year? (circle one): Yes or No

7: If you were hurt or received physical therapy, did you receive clearance to resume participation in physical activity? If so, when did you receive clearance? (circle one):

Yes or No Date Cleared: _____

8: Have you ever used any type of pedometer before? (circle one): Yes or No

If so, what kind _____

9: Do you have a computer or laptop with a USB port? (circle one): Yes or No

10: Do you have access to the internet? (circle one): Yes or No

11: Do you have a car or access to transportation? (circle one): Yes or No

Participant Signature: _____

Student author Signature: _____

APPENDIX C

PAR-Q & YOU

Physical Activity Readiness
Questionnaire - PAR-Q
(revised 2002)

PAR-Q & YOU

(A Questionnaire for People Aged 15 to 69)

Regular physical activity is fun and healthy, and increasingly more people are starting to become more active every day. Being more active is very safe for most people. However, some people should check with their doctor before they start becoming much more physically active.

If you are planning to become much more physically active than you are now, start by answering the seven questions in the box below. If you are between the ages of 15 and 69, the PAR-Q will tell you if you should check with your doctor before you start. If you are over 69 years of age, and you are not used to being very active, check with your doctor.

Common sense is your best guide when you answer these questions. Please read the questions carefully and answer each one honestly: check YES or NO.

YES	NO		
☐	☐	1.	**Has your doctor ever said that you have a heart condition and that you should only do physical activity recommended by a doctor?**
☐	☐	2.	**Do you feel pain in your chest when you do physical activity?**
☐	☐	3.	**In the past month, have you had chest pain when you were not doing physical activity?**
☐	☐	4.	**Do you lose your balance because of dizziness or do you ever lose consciousness?**
☐	☐	5.	**Do you have a bone or joint problem (for example, back, knee or hip) that could be made worse by a change in your physical activity?**
☐	☐	6.	**Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?**
☐	☐	7.	**Do you know of any other reason why you should not do physical activity?**

If you answered

YES to one or more questions

Talk with your doctor by phone or in person BEFORE you start becoming much more physically active or BEFORE you have a fitness appraisal. Tell your doctor about the PAR-Q and which questions you answered YES.

- You may be able to do any activity you want — as long as you start slowly and build up gradually. Or, you may need to restrict your activities to those which are safe for you. Talk with your doctor about the kinds of activities you wish to participate in and follow his/her advice.
- Find out which community programs are safe and helpful for you.

NO to all questions

If you answered NO honestly to all PAR-Q questions, you can be reasonably sure that you can:

- start becoming much more physically active – begin slowly and build up gradually. This is the safest and easiest way to go.
- take part in a fitness appraisal – this is an excellent way to determine your basic fitness so that you can plan the best way for you to live actively. It is also highly recommended that you have your blood pressure evaluated. If your reading is over 144/94, talk with your doctor before you start becoming much more physically active.

DELAY BECOMING MUCH MORE ACTIVE:

- if you are not feeling well because of a temporary illness such as a cold or a fever – wait until you feel better; or
- if you are or may be pregnant – talk to your doctor before you start becoming more active.

PLEASE NOTE: If your health changes so that you then answer YES to any of the above questions, tell your fitness or health professional. Ask whether you should change your physical activity plan.

Informed Use of the PAR-Q: The Canadian Society for Exercise Physiology, Health Canada, and their agents assume no liability for persons who undertake physical activity, and if in doubt after completing this questionnaire, consult your doctor prior to physical activity.

NOTE: If the PAR-Q is being given to a person before he or she participates in a physical activity program or a fitness appraisal, this section may be used for legal or administrative purposes.

"I have read, understood and completed this questionnaire. Any questions I had were answered to my full satisfaction."

NAME _____

SIGNATURE _____ DATE _____

SIGNATURE OF PARENT _____ WITNESS _____
or GUARDIAN (for participants under the age of majority)

Note: This physical activity clearance is valid for a maximum of 12 months from the date it is completed and becomes invalid if your condition changes so that you would answer YES to any of the seven questions.

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APPENDIX D

WEEKLY MEETING QUESTIONNAIRE

The purpose of this questionnaire is to gain your insight and opinion on how the study is going thus far. This questionnaire will be conducted weekly so that the student author can stay informed, answer any of your questions, or help in anyway.

1. How do you feel so far?

   _____

   _____

2. Do you like using the pedometer?

   _____

   _____

3. Is the pedometer easy to operate?

   _____

   _____

4. What are you thinking as you look at your graph today?

   _____

5. Is seeing your graphed results helpful?

   _____

   _____

6. Do you have any questions or comments?

   _____

   _____

APPENDIX E

INTEGRITY CHECK LIST

Participant: _____ Date of meeting: _____ Exp. Condition_____

Observer: _____ Duration of meeting: _____

Please check yes or no:

Question	Yes	No
1. Was the participant and the student author both present?		
2. Did the participant log into their personal Omronwellness account?		
3. Did the participants data accurately upload to their account?		
4. Did the student author go over the step results with the participant?		

5. Was verbal praise or words of encouragement provided to the participant?		
6. Was a new short-term goal or current goal set?		
7. Was the new short-term goal calculated correctly?		
8. Did the numbers on the pedometer match the numbers displayed on the Omronwellness account?		

APPENDIX F

SOCIAL VALIDITY QUESTIONNAIRE

Thank you for completing the research study. Please take a few minutes to give the researcher your feedback on the study.

Please rank the following questions in order of relevance, with 1 being the most important and 2 being the least important:

Steps:

____ I found it easy to keep up with my steps.

____ I found it difficult to keep up with my steps.

Please rank the following questions in order of relevance, with 1 being the most important and 3 being the least important:

Baseline Length:

____ The length of baseline period was shorter than I expected.

____ The length of baseline was the length I expected.

____ The length of the baseline period was what I expected.

Comments:

_____

Feedback:

____ I liked how the feedback was delivered

____ I was impartial to how the feedback was delivered

____ I did not like how the feedback was delivered

Comments:

_____

Please rank the following questions in order of relevance, with 1 being the most important and 4 being the least important:

Why did you join the study?

____ Become physically active ____ Enjoy walking

____ Lose Weight ____ Stress Relief

Other:

_____

Baseline:

____ The baseline phase was explained well. ____ I understood what to expect.

____ The baseline phase was not explained well. ____ Baseline was confusing.

Weekly Meeting:

____ I found the weekly meetings helpful. ____ I did not like the weekly meetings.

____ The weekly meetings were run efficiently. _____The weekly meetings were not run efficiently

Comments:

_____

Please rank the following questions in order of relevance, with 1 being the most important and 4 being the least important:

Omronwellness.com:

____ I found the Omronwellness.com site easy to use.

____ I found the Omronwellness.com site difficult to use.

____ I liked using this site to keep track of my goals and graphing my results.

____ I could have gone without the site to track and display my graphed results.

Comments:

_____

Please rank the following questions in order of relevance, with 1 being the most important and 5 being the least important:

Goals:

____ I liked the methods used to set my weekly goals

____ I did not like the methods used to set my weekly goals

____ I liked having both a short-term and long-term goal

____ Having short-term goals pushed me to walk more

____ Having short-term goals made no difference on my steps

Please rank the following questions in order of relevance, with 1 being the most important and 6 being the least important:

Pedometer:

____ I found the pedometer easy to use ____The pedometer was difficult to use

____ I liked using the pedometer to keep track of my steps

____ I did not like using the pedometer to keep track of my steps

____ I found it easy to remember to wear the pedometer each day

____ I found it difficult to wear the pedometer each day

Comments:

_____

Please rank the following questions in order of relevance, with 1 being the most important and 7 being the least important:

What were the benefits of participating in this study?

____ Healthier lifestyle overall ____ Weight loss ____ Became more physically active ____ Less stress ____ More active ____ More energy ____ Better sleep

Other:

_____

Would you recommend this study to others? Why/ Why not?

_____

_____

Do you believe you will continue this program now that the study had ended? Circle:

Yes or No

If so, can I stay in contact to see how you are doing? Circle: Yes or No

Please provide any further comments or advice for the researcher:

_____

_____

Thank you again for your participation in this research study.