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THE EFFECTS OF A GOAL SETTING PROGRAM ON THE EXERCISE COMMITMENT
AND FITNESS LEVELS OF UNIVERSITY STUDENTS

A Thesis

Presented to the Faculty of
Western Washington University

In Partial Fulfillment
of the Requirement of the Degree
Master of Science

by

Rahmin Buckman

April 2011

THE EFFECTS OF A GOAL SETTING PROGRAM ON THE EXERCISE COMMITMENT AND
FITNESS LEVELS OF UNIVERSITY STUDENTS

By
Rahmin Buckman

Accepted in Partial Completion
Of the Requirements for the Degree
Master of Science

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MASTER'S THESIS

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ABSTRACT

The purpose of the current study was to examine the effects a goal setting program had on exercise commitment and aerobic fitness among university students. Obesity and a lack of sufficient physical activity continue to be a problematic and increasing epidemic in the United States. Some theorists have utilized goal setting as an intervention to increase commitment effectiveness of exercise participants. In the current study, a two-way between-within experimental design was utilized involving two separate physical education activity classes (beginning jogging) at Western Washington University. One of the classes (experimental group) underwent a goal setting program consisting of educational, constructive, and evaluative components aimed to pursue a self-selected aerobic fitness goal while the other class (control group) did not. Components of exercise commitment and aerobic fitness level measurements were taken at the onset and again at the termination of the goal setting implementation. Upon computing 11 separate two-way between-within ANOVAs and effect sizes, the results produced little statistical significances and effects. However, the results of this study revealed several practical trends related to exercise commitment and physical activity. Findings and considerations for future direction are provided in hopes that further research and practical methods regarding goal setting, exercise commitment, and fitness level can be improved upon.

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Chapter I

The Problem and Its Scope

Introduction

Obesity continues to be a problematic and increasing epidemic in the United States. In 2008, the national obesity rate in the United States was approximately 26% (Centers for Disease Control [CDC], 2009). Obesity is a risk factor for an array of cardiovascular diseases, types of cancer and diabetes (CDC, 2009). There is a need to prevent such health hazards by reducing the incidence of obesity among the American population. Though regular exercise is a major factor that reduces the risk of obesity (CDC, 2009), many do not engage in the recommended levels of physical activity. In 2007, for example, only 48.8% of Americans reported to regularly engage in recommended amounts of exercise, while approximately 24% reported no engagement in any kind of leisure physical activity (CDC, 2008).

There are many physical and psychological benefits that are received from participation in physical activity including: improving overall physical fitness and appearance, managing one's weight, gaining more energy throughout the day, competitive reasons (for sport participants), social networking, enjoyment, and reducing stress/anxiety (Anderson, 2003; De Andrade Bastos, Salguero, González-Boto, & Marquez, 2006; Kilpatrick, Hebert, & Bartholomew, 2005; Poole, 2001). Unfortunately, people often discontinue exercising regularly for reasons such as the lack of time, loss of motivation and interest, monetary costs, embarrassment, and insufficient encouragement (Anderson, 2003; Kamarudin & Omar-Fauzee, 2007). Due to the importance of maintaining a regular exercise habit for one's physical and psychological well-being, it may be helpful to employ behavioral strategies such as goal-setting in order to enhance and maximize one's commitment to the lifelong pursuit of a healthy lifestyle.

The concept of commitment to and persistence with physical activity has been discussed by many sport and exercise psychology researchers in order to determine what exactly influences one's commitment level (Casper, Gray, & Babkes-Stellino, 2007; Scanlan, Carpenter, Schmidt, Simons, & Keeler, 1993; Wilson et al., 2004). For example, it has been suggested that the use of goal setting strategies and techniques are advantageous to those engaging in physical activity, particularly when intending to increase one's compliance to exercise (Annesi, 2002; Cobb, Stone, Anonsen, & Klein, 2000; Wilson & Brookfield, 2009). Determining the effects a comprehensive goal setting program has on the various components of exercise commitment may yield a better understanding in the functioning of goal setting as well as the overall concept of exercise commitment. This information can then be reflected upon analysis by those who endeavor to increase exercise commitment levels and prolong healthy lifestyles. It would be hoped that increasing one's exercise commitment would result in greater physical and psychological benefits.

Purpose of the Study

The purpose of this study is to examine the effects a goal setting program has on the exercise commitment and fitness levels of university students.

Hypotheses

A total of three hypotheses were tested in this study. First, there will be no difference between the experimental and control groups score on the eight different components of exercise commitment (want to commitment, have to commitment, enjoyment/satisfaction, social constraints, social support, involvement alternatives, personal investment, and involvement opportunities) over time. Secondly, there will be no difference in the exercise commitment behaviors (amount of days and hours per week spent exercising) between the experimental (goal

setting) and the control group over time. The third hypothesis of this study proposed that there will be no difference in the performance of the Cooper 12 minute walk/run aerobic fitness test between the experimental (goal setting) and control group over time.

Significance of the Study

The significance of this study is that it examines the effects that a goal setting program has on the components of the exercise commitment and aerobic fitness level. More specifically, this study aims to investigate such effects of a comprehensive goal setting program that includes educational, formulation, time management, and constructive evaluative components for setting aerobic fitness goals. Furthermore, the study intends to investigate the effects this goal setting program has on dimensions of the exercise commitment scale, exercise frequency and duration, and performance in the Cooper 12 minute walk/run fitness test. Additionally, the significant effects of exercise commitment and fitness components may potentially demonstrate the effectiveness the exercise commitment scale has on the specific population of university students. Furthermore, this current study may also provide practical significance for those who intend to use goal setting strategies to adhere to exercise habits and behaviors

Limitations of the Study

1. The findings among the sample may not externally validate the entire population of exercisers since the sample has age specifications and is taken from a specified region of the country.
2. Perceptions and participation frequencies were self-reported only on two separate days; therefore, these measures may not be precisely represented as the entire two and a half months in which the experiment took place.

3. The perception of commitment may vary from person to person. Factors such as personality and past personal experiences may affect one's own reported commitment measures. These measures perceived differently across individuals can potentially cause issues in such subjective measures.
4. Self-reports of recalled commitment levels and behaviors may not accurately reflect actual commitment levels and behaviors.
5. If the treatment group produces superior results than the control group, it would be highly difficult to pinpoint exactly which portions of the goal setting program were most effective.
6. The control and experimental group were enrolled in the physical education activity courses on separate days, and therefore, performed certain fitness tasks under different environmental conditions.
7. Due to the holidays of Thanksgiving and Veterans day, class sessions for the control group met two less than that of the goal setting group.
8. Experimenter bias may have occurred due to the fact that the experimenter was also the instructor for both physical activity courses.
9. The weather conditions were different for both classes since the experimental and control group met on different days in the academic quarter.

Definitions

Commitment- The desire and resolve to continue participation in an activity (Scanlan, Carpenter, et al., 1993).

Exercise commitment- An obligatory or functional resolve to continue exercising (Wilson et al., 2004)

Goal proximity- The temporal nature of goals, short or long term (Corrêa, De Souza Jr., & Santos, 2006).

Goal specificity- Goal specificity refers to the level of clarity of the intended task that satisfies attaining the goal (Kane, Baltes, & Moss, 2001).

Involvement alternatives- The way in which the attractiveness of other more appealing activities compares with the current sport activity the athlete is currently engaged in (Scanlan, Carpenter, et al., 1993).

Involvement opportunities- The benefits that are received through continued involvement in sport; examples may include making new or maintaining friendships, gaining physical fitness, or learning to master a particular set of sport specific skill (Scanlan, Carpenter, et al., 1993).

Outcome goal- Measuring success by making a comparison with others (Filby, Maynard, & Graydon, 1999).

Participation frequency- The specific amount which one participates in their respective activity (Casper et al., 2007).

Performance goal- Identifying an end product of performance that can be achieved relatively independently of others (Filby et al., 1999).

Personal investments- The amount of personal resources (ex. time, effort, and money) that are being dedicated to the activity, and can not be retrieved upon termination of the participation in the sport activity (Scanlan, Carpenter, et al., 1993).

Process goal- Identifying specific behaviors necessary for successful performances (Filby et al., 1999).

Social constraints- Any sort of social expectations, norms, and/or pressures [from parents, coaches, or peers] that create feelings obligations to continue participation (Scanlan, Carpenter, Schmidt et al., 1993).

Social support- Perceptions that others support, encourage, or affirm their participation in a particular activity (Carpenter & Coleman, 1998).

Sport commitment- The mental state where one has the desire to persist in participation of a given sport (Scanlan, Carpenter, et al., 1993).

Sport enjoyment- Having positive associations such as feelings of pleasure and fun that are coupled with the involvement in a particular sporting experience (Scanlan, Carpenter, et al., 1993).

Chapter II

Review of Literature

Introduction

A number of studies have revealed the psychological and physical incentives people have to begin and maintain (Farrell & Thompson, 1998; Finkenber, DiNucci, McCune, & McCune, 1994). Yet there are many other reasons for discontinuation of exercise (Anderson, 2003; Kamarudin & Omar-Fauzee, 2007). For someone to continue exercising, it is necessary to find ways to enrich one's commitment level while preventing dropping out of a given exercise regimen. Since the purpose of this study is to examine the effects goal setting has on exercise commitment, it is highly desirable to discover all pertinent information in a physical activity setting regarding commitment, as well as goal setting.

Included in this review of the literature are the various concepts regarding commitment and goal setting, especially as they pertain to the physical activity setting. Sport and exercise psychology experts have constructed theories that aimed to elaborate on the function of sport and exercise commitment (Ajzen & Madden, 1986; Bandura, 1977; Scanlan, Carpenter, Schmidt, Simons, & Keeler, 1993; Wilson et al., 2004). Such theoretical commitment-related models include the exploration of the predictor variables for sport and exercise commitment (Scanlan, Carpenter, et al., 1993; Wilson et al., 2004), behavioral outcomes of commitment (Casper, Gray, & Babkes-Stellino, 2007; Raedeke, Warren, & Granzyk, 2002), and implementations to enrich the components that theoretically determine commitment levels (Annesi, 2002; Sousa, Smith, & Cruz, 2008; Wilson & Brookfield, 2009).

Also included in this review of the literature are the studies that encompass the use of goal setting. Goal setting has also received an ample amount of attention within sport and

exercise over the past several decades (Locke & Latham, 2007). The effects of goal setting, effective goal setting techniques, and goal setting habits have been common themes that are embedded within the goal setting literature (Kyllo & Landers, 1995; Latham, 2003; Locke & Latham, 2006). Because the purpose of this study is to examine the effects goal setting has on exercise commitment, an inspection on any associations made between goal setting and commitment will take place in this literature review.

Exercise Adherence and Compliance

Reasons for continuing and discontinuing exercise. There have been studies that have exhibited reports of numerous psychological and physical benefits gained through exercise (Farrell & Thompson, 1998; Finkenber, DiNucci, McCune, & McCune, 1994). For instance, when 164 adults were asked reasons for beginning and continuing exercise, physical and psychological health were variables that correlated to their exercise commitment scores (Farrell & Thompson, 1998).

In another study, 294 college students enrolled in physical education courses were surveyed about their incentives were for exercising. Fitness was reported as the biggest incentive to exercise followed by mental benefits, being more flexible or agile, appearance, and mastery of a particular skill. Other reported incentives also included affiliation, competition, social recognition, and health benefits health (Finkenber et al., 1994). An additional finding revealed gender differences among motives of exercise: men reported significantly higher measures of competition and significantly lower on the appearance and weight management as motives (Finkenber et al., 1994).

Even though there are multiple reported benefits that accompany engagement in exercise, there are also several counteracted factors that drive the cessation of exercising habits (Anderson,

2003; Kamarudin & Omar-Fauzee, 2007). For instance, Kamarudin and Omar-Fauzee (2007), administered a survey to 80 Malaysian college students asking about barriers of exercise. The most frequently reported barriers to physical activity include monetary costs, embarrassment, and taking too much time (Kamarudin & Omar-Fauzee, 2007).

In a similar study conducted by Anderson (2003), nearly 400 undergraduate students were surveyed to identify reasons they had discontinued their exercise regimen. Most frequently reported reasons for dropping out of exercise included: lack of time, loss of interest or motivation, fatigue, laziness, embarrassment about performance or appearance, and lack of progress respectively (Anderson, 2003).

To better comprehend reasons why people engage in exercising habits, it is also necessary to explore certain theoretical models relating to exercise adherence and compliance (Biddle, Hagger, Chatzisarantis, & Lippke, 2007). Biddle and colleagues (2007) suggested that inspecting exercise related theories may also explain the functioning and processes for exercise maintenance, which then can potentially be incorporated into a customized exercise program to which people can adhere (Biddle et al., 2007). There are many behavioral theories that have attempted to explain the operational aspects of exercise compliance, but there are only a select few that have received much attention in exercise psychology literature (Biddle et al., 2007; Buckworth & Dishman, 2007); in particular the self-efficacy model (Bandura, 1977), the transtheoretical model (Prochaska & DiClemente, 1983), and the theory of planned behavior (Ajzen & Madden, 1986).

Self-efficacy model. The self-efficacy model states that one's behavior to achieve a particular consequence is dictated based on one's self-beliefs (Bandura, 1977). The self-efficacy model, as Bandura (1977) proposed, consists of two separate subjective and abstract mechanisms

that drive behavioral outcomes: efficacy expectations and outcome expectations. Efficacy expectation (aka self-efficacy) is defined as the conviction that one can successfully execute the behavior required to produce the outcomes. This consists of four components: past accomplishments or failures related to the intended task (performance accomplishments), evaluating the outcomes of those with similar abilities (vicarious experience), suggestions or persuasions from others that the task can be accomplished (verbal persuasion), and speculation of physiological states such as stress or relaxation that may be elicited by certain behaviors (emotional arousal) (Bandura, 1977).

The other aspect of self-efficacy, outcome expectations, is defined as a person's estimate that a given behavior will lead to certain outcomes. The theory then further suggests that these elements of self-efficacy heavily influence a person's choice of activities in addition to the longevity and intensity of effort one will expend for that particular activity (Bandura, 1977).

Recent studies have applied the self-efficacy model to explain how individuals maintain an exercising habit over an extended period of time (Annesi, 2006; Resnick, 2004; Strachan, Woodgate, Brawley, & Tse, 2005). For instance, in a longitudinal study carried out by Resnick (2004), 78 elderly people living in a retirement community were administered a questionnaire once a year for four consecutive years. Measurements in the questionnaire included self-efficacy and outcome expectancy measures for exercise. In addition, subjects were asked whether they were exercising continuously for 20 minutes at least three times a week. Although findings revealed that the efficacy-outcome expectancy and outcome expectancy-exercise habits relationships were significant only for years 1 and 4 of the survey, data revealed that changes in one's self-efficacy influenced the exercise behaviors in a consistent manner over the four year study (Resnick, 2004).

In another study, Strachan and colleagues (2005) examined 67 'maintenance' runners belonging to a running group to examine the link between self-efficacy of running and frequency of running or other vigorous forms of physical activity. Subjects self reported a) their ability to continue running despite facing barriers (barrier self-efficacy), b) their ability to make room to run in their schedule (schedule self-efficacy), and c) their ability run for a duration ranging from 30 minutes to 3.5 hours. Approximately four weeks later, telephone interviews took place to obtain exercise measures (i.e. how often and for how long they engaged in running or any other vigorous physical activity over the previous week). Findings in this study suggested that all three forms of self-efficacy were significant in predicting running behaviors (Strachan et al., 2005).

Similarly, Annesi (2006), observed the effect self-efficacy for exercise had on voluntary physical activity among 125 adolescents enrolled in a 12-week after-school physical activity program. Like previous self-efficacy related studies, barriers to self-efficacy were measured. Also measured was voluntary physical activity which consisted of the number of days over the previous week a participant engaged in moderate-to-vigorous physical activity outside of physical education classes or any programs associated with after-school care. These measurements were taken at the first and last (12th) week of the after school physical activity program. Results indicated that the self-efficacy measures were significantly correlated with voluntary physical activity over the 12 week period (Annesi, 2006).

Transtheoretical model. The Transtheoretical Model (TTM) aims to describe behavioral changes in a series of five separate non-linear and cyclical stages (Prochaska & DiClemente, 1983). As Prochaska and DiClemente (1983) proposed, the first stage of behavioral change is pre-contemplation where the individual has no intent on changing a targeted behavior. The

second stage is contemplation, where the person evaluates the benefits and hindrances of a particular behavior and intends on engaging in that behavior within the next six months. The third stage is preparation, which is when the person plans on changing the specified behavior sometime in the near future (i.e. within the next 6 months). The next stage of change signifies the beginning of engagement in the targeted behavior; this is known as the action stage.

Maintenance is the final stage of change that occurs when one has continued the intended behavior for an extended period of time (i.e. for at least 6 months). Prochaska and DiClemente (1983) also noted that people in any particular stage can either remain, progress, or regress into any other stage at any given rate of time.

There have been numerous times when the TTM had been applied in a physical activity setting, attempting to explain the process of initiating and maintaining exercise behavior (Marshall & Biddle, 2001). For instance, in a meta-analysis by Marshall and Biddle (2001), 80 independent samples ranging in various demographics (ex. educational, exercise facilities, worksite, etc.) were analyzed to find common exercising habits and characteristics within each stage relevant to the TTM. Overall findings of the study suggested that the level of physical activity, self-efficacy, and reported perceived advantages of exercising increased as individuals advanced to the next higher stage of change (Marshall & Biddle, 2001).

In more specific terms, as Marshall and Biddle (2001) explained, there were distinct exercise qualities identified in each stage of change. In the precontemplative stage of exercise, individuals are relatively sedentary, and do not intend on being physically active in the near future. In this stage, perceived benefits of exercise, measures of self-efficacy and physical activity are minimal. Unlike the precontemplative stage, the contemplative stage occurs when those intend on exercising sometime in the foreseeable future. Although they begin

acknowledge the advantages of exercise and intend on being physically active sometime in the near future, physical activity levels are still low and change very little. In the next stage, the preparation stage, individuals begin to develop and embark on some sort of action plan to meet a specified exercise criterion. In the fourth stage, the action stage, exercise initiation commences and endures for approximately six months. During this stage, physical activity levels sharply rise to meet a certain standard for physical activity. Maintenance is the fifth and final stage of the TTM occurs when a person has consistently met a criterion level of PA for approximately six months.

Theory of planned behavior. Another behavioral theory that has gained much attention in the exercise psychology arena is the theory of planned behavior (Hagger, Chatzisarantis, & Biddle, 2002). The theory of planned behavior is a multidimensional model which attempts to explain that intentions, which ultimately drive behaviors, are contingent upon an assortment of attitude, social beliefs, and perceived difficulty in carrying out the behavior (Ajzen & Madden, 1986). Proposed by Ajzen and Madden (1986), the intent to engage in a particular behavior is based on three interrelated yet independent variables: attitude toward the behavior, subjective norms, and perceived behavioral control. The attitude towards the behavior is the degree to which the person will favor or not favor the particular behavior. Subjective norms refer to the perceived social pressures to pursue or not pursue the intended behavior. The third predictor of behavioral intentions, perceived behavioral control, is the perceived difficulty level in carrying out the intended behavior. Perceived behavioral control is also theorized to be the only one of the three determinants of behavior intentions to have a direct influence on actual exhibited behavior (Ajzen & Madden, 1986).

The theory of planned behavior has been applied in past exercise research to explain the beliefs and attitudes that compliment compliance to an exercise habit (Hagger et al., 2002). In a meta-analysis involving 79 independent samples in 71 research studies, Hagger and colleagues (2002) examined the validation of links between the theories constructs in a physical activity setting. Results indicated that the theory of planned behavior constructs did indeed affirm validation for the model. More specifically, one's attitude towards physical activity, perceived pressures from others to exercise, and the view of how challenging it would be to engage in the particular type of physical activity will influence one's intentions to partake in that act of exercise. Those intentions then heavily determine whether the person actually participates and maintains the targeted exercise regimen (Hagger et al., 2002).

Sport and Exercise Commitment Behaviors

Remaining versus quitting. Many researchers have examined sport and exercise commitment behavioral outcomes as a function of one's commitment level (Anderson, 2003; Pini, Calamari, Puleggio, & Pullerà, 2007; Raedeke, 1997; Raedeke, Granzyk, & Warren, 2000; VanYperen, 1998; Wilson et al., 2004). Since the definition of sport commitment involves persistence in participation of a given activity (Scanlan, Carpenter, et al., 1993), commitment behavior researchers (Raedeke et al., 2002; Van Yperen, 1998) have examined is the remaining or dropping out of a given activity.

For instance, VanYperen (1998) postulated that certain determinants of commitment predicted one's intentions to quit engagement in the particular activity. In a sports context, this translates to actual de-selection from a given sport (quit vs. stay). To provide support for this notion, 326 Dutch volleyball officials, including those who have officiated games on a local, national, and international level, were given a questionnaire at two different time frames: two

months before the end of the season, and then again six months later. Results showed that most of the proposed determinants of commitment significantly predicted one's intent to quit officiating. Additionally, 87.9% of those who indicated they were going to continue officiating actually did so, and 76.6% of those indicated the intention to quit actually did so 6 months later, suggesting that the intention to quit obtains a strong link with actual discontinuation of the activity (VanYperen, 1998).

Raedeke and colleagues (2002) carried out a similar study where a questionnaire was filled out by 300 current swim coaches and 157 coaches who had left coaching within 12 months of the administering of the questionnaire. Variables related to commitment were all compared and contrasted amongst current coaches and those who had quit coaching within the past year. Researchers identified that most of these variables theoretically related to sport commitment were significantly different amongst the two sets of coaches. Not surprisingly, those who currently coach reported higher commitment measures as well as the measures of the commitment related variables than those who left coaching (Raedeke et al., 2002).

Exercise researchers have also widely examined reasons for discontinuation of exercise habits, Anderson (2003) is among one of them who had examined nearly 400 undergraduate students' reasons for quitting exercising habits. Most frequently reported reasons for dropping out of exercise included: lack of time, loss of interest or motivation, fatigue, laziness, embarrassment about performance or appearance, and lack of progress respectively (Anderson, 2003). Such variables are considered to be theoretical determinants of commitment and will be discussed later in the review of literature.

Participation frequency, intensity and duration. Another more specified method that has measured behaviors as a result of commitment is the participation frequency, intensity and

duration of the activity one engages in (Casper, 2007; Casper et al., 2007; Wilson et al., 2004). Participation frequency refers to the specific amount to which one participates in the respective activity (Casper et al., 2007). In a recent study involving behaviors of sport commitment, Casper et al. (2007) asked over 500 adult recreational tennis participants how often they played tennis (e.g. how many times they practiced, competed, or just played) in a given week for each of the four seasons. Correlation analysis suggests that there is a significant relationship between one's commitment level and how often one engages in playing the particular sport (Casper et al., 2007).

Studies in an exercise setting have also revealed the link between participation frequency and exercise commitment (Gabriele, Walker, Gill, Harber, & Fisher, 2005; Pini et al., 2007; Wilson et al., 2004). In a recent study, Pini and colleagues (2007) assessed commitment levels of physical activity in addition to the exercise frequency and duration of PA among 50 Physical Education teachers in a typical week. Findings confirmed that the associations between the number of weekly training sessions of PA and commitment to exercise measures were significant and positive (Pini et al., 2007).

Other research findings have also provided evidence to suggest that commitment measures have been linked with participation frequency (Gabriele et al., 2005; Wilson et al., 2004). For instance, Wilson et al. (2004) administered a questionnaire to over 400 university students enrolled in fitness classes that assessed how many times per week they engaged in mild, moderate, and strenuous exercise for at least 20 minutes per session during a typical week. Findings indicated that exercise behavior had a moderate to strong association with commitment measures. Nearly a year later, Gabriele and colleagues (2005) utilized similar measures to evaluate exercise behaviors as a function of exercise commitment among 244 university students not necessarily enrolled in fitness classes. Findings showed that the amount of time and intensity

spent exercising was also significantly and positively related to commitment measures in addition to the theoretical antecedents of exercise commitment (Gabriele et al., 2005).

Detriments of commitment. Although being committed to a certain activity can be seen as something positive, commitment can also prove to be related to some detrimental behaviors such as burnout (Raedeke, 1997; 2004; Raedeke et al., 2000), perfectionism (McLaren, Gauvin, & White, 2001), and dietary restraint eating disorders (McLaren et al., 2001; Pini et al., 2007). Burnout occurs when an athlete becomes physically/mentally exhausted, depreciates the sport and experiences reduced athletic achievements (Raedeke, 1997). It has also been found to be negatively correlated with measures of commitment, theoretical determinants of commitment, and motivation (Raedeke, 2004).

For instance, in a study conducted by Raedeke and colleagues (2002) nearly 300 swim coaches were given a questionnaire that measured their level of commitment and burnout with regard to coaching. Even though there were coaches who reported higher than average commitment levels also reported high levels of investments (time and energy) complimented with the highest levels of burnout measures (Raedeke et al., 2000). In a one-year follow-up study with the same coaches, the same questionnaire was given (Raedeke, 2004). Those who had reported relatively strong measures of commitment, burnout, and investments a year previous, had currently reported lower levels of commitment and satisfaction while simultaneously reporting elevated levels of exhaustion, investments, and costs of coaching (Raedeke, 2004).

Other potentially harmful outcomes that could result in over-commitment are perfectionism and dietary restraints (McLaren et al., 2001; Pini et al., 2007). McLaren and colleagues (2001) conducted a study where 269 female college students were administered a questionnaire that

measured their psychological commitment to exercise, exercise frequency/intensity, perfectionistic tendencies (ie. social, self-image and self-oriented perfectionism) and dietary restraints. Results suggested that not only did excessive commitment to exercise significantly predict dietary restraint variables, but excessive commitment to exercise was also a partial mediating variable in the association between the 3 dimensions of perfectionism and dietary restraints (McLaren et al., 2001). In a similar and more recent study, Pini and colleagues (2007) also administered a questionnaire to 50 Physical Education teachers measuring commitment to exercise and proneness for eating disorders (ex. drive for thinness, body dissatisfaction, perfectionism, ect.). Results indicated positive correlations between exercise commitment and certain variables of the eating disorder inventory such as perfectionism, social insecurity, and asceticism (Pini et al., 2007).

The Sport Commitment Model

The concept of sport commitment has long been believed to be an extremely valuable tool for guiding behavior. In earlier writings in the physical activity setting, the idea of commitment was thought of as a product of other theoretical determinants as described in the Sport Commitment Model (SCM) (Scanlan, Carpenter, et al., 1993). Originators of the SCM had described the term sport commitment as the mental state where one has the desire to persist in participation of a given sport (Scanlan, Carpenter, et al., 1993). The SCM hypothesizes that five independent determinants predict one's level of sport commitment. These five independent variables consist of: sport enjoyment, involvement alternatives, personal investments, social constraints, and involvement opportunities; all of which except for involvement alternatives are theoretically positively associated with sport commitment (Scanlan, Carpenter, et al., 1993). Developers of the SCM utilized structural equation methods to validate the construct of the

model, utilizing a sample of over 1,000 youth sport participants (Carpenter, Scanlan, Simons, & Lobel, 1993). Calculations revealed that the model obtained a comparative fit index of (CFI) .981, indicating a reasonably good fit for the data (Carpenter et al., 1993).

Enjoyment/satisfaction. The first variable described to predict one's level of sport commitment is sport enjoyment, which is defined as a having positive associations (feelings of pleasure, liking, and fun) that are coupled with the involvement in a particular sporting experience (Scanlan, Carpenter, et al., 1993). Following the construct of the SCM, many experts in the field (Scanlan, Russell, Beals, & Scanlan, 2003; Weiss, Kimmel, & Smith, 2001) have emphasized that the sport enjoyment determinant has a larger effect than the other four determinants of sport commitment. For instance, when Weiss and colleagues (2001) administered a questionnaire measuring variables of the SCM to nearly 200 youth tennis participants, out of all the determinants of sport commitment, sport enjoyment measures had the highest correlation with commitment measures. Specifics regarding the measurement of these determinants administered in all studies regarding the SCM will be discussed in later sections of this literature review.

Aside from examining the relationship between commitment and sport enjoyment amongst a youth population, older and elite athletes have also replicated similar findings. For instance, members of the highly prestigious, world class New Zealand rugby team (the All Blacks), were interviewed discussing their sources or commitment with regards to the variables in the SCM (Scanlan, Russell, Wilson, & Scanlan, 2003). The most frequently confirmed determinant variable of sport commitment that contributed to their overall dedication to the team was indeed the sport enjoyment variable (Scanlan, Russell, Beals, et al., 2003). Having youth participants, as well as adult world class athletes, confirm the importance of sport enjoyment (i.e.

love of the game and taking pleasure in being around team members on and off the field) from these studies provide powerful evidence to suggest that sport enjoyment predicts one's level of sport commitment, even at an elite level.

In an exercise setting, levels of enjoyment and satisfaction have also been a significant contributing factor in one's physical activity participation levels (Motl, 2001; Salmon, Owen, Crawford, Bauman, & Sallis, 2003). For instance, in a study conducted by Salmon and colleagues (2003), a series of questionnaires that included assessments of the amount of PA in which they engaged the past week and the enjoyment levels and preferences for engagement in exercising indicated that enjoyment of physical activity was a significant predictor of participating in physical activity. This suggests that one's enjoyment level and preferences for PA holds high predictive power in determining one's own physical activity frequencies (Salmon et al., 2003). In another study carried out by Motl et al. (2001), over 1700 8th grade girls were surveyed to examine levels and sources of activity enjoyment, the amount of exercise they engaged in the past three days, and physical fitness. Results indicated that the sources and levels of enjoyment in physical activities had significant direct effects of one's physical activity levels and intensity (Motl et al., 2001).

Involvement Alternatives. The second variable of the SCM that influences sport commitment is involvement alternatives. This variable represents the way in which the attractiveness of other activities compare with the current sport activity the athlete is currently engaged in and is the only factor of the SCM that is postulated to negatively affect sport commitment (Scanlan, Carpenter, et al., 1993). There have been a few reported instances where measures for the attractiveness of other activities have been found to negatively affect sport commitment levels (Butcher, Linder, & Johns, 2002; Raedeke, 1997; 2004; Raedeke et al., 2000).

In one study Raedeke (1997) examined over 200 youth swimmers to determine possible links between the pillars of sport commitment and swimmer burnout. Upon administering a questionnaire and using a cluster analysis to discover common profiles or subgroups of swimmers that display distinct patterns of commitment determinants, one group of swimmers with relatively high commitment levels reported that swimming was the most attractive available activity. Conversely, those in the subgroup with the highest burnout levels reported higher measures of other activities being more attractive compared to those with lower burnout measures (Raedeke, 1997).

A similar study using a nearly identical questionnaire was replicated a few years later, but this time researchers administered the surveys to the swim coaches instead of the swimmers (Raedeke, 2004; Raedeke et al., 2000). Nearly identical findings were exposed in the sense that those coaches who obtained high measures of burnout, as well as those who were less interested in coaching, also reported higher measures of attractive alternatives. Conversely, those in the sample who obtained comparatively higher ratings of satisfaction and commitment with coaching, contained inferior scores of engaging in alternative activities other than coaching (Raedeke, 2004; Raedeke et al., 2000).

The attractiveness of other activities has also been shown to negatively decrease participation in physical activity (Kamarudin & Omar-Fauzee, 2007; Salmon et al., 2003; Spanier & Allison, 2001). Particularly when one perceives a stronger obligation to their family or other relationships, engagement in regular activity becomes less frequent (Kamarudin & Omar-Fauzee, 2007; Spanier & Allison, 2001). In an Ontario health survey that involved over 29,000 relatively healthy 18-59 year olds, familial structure as well as their frequency of physical activity over the course of the previous month were assessed (Spanier & Allison, 2001).

Findings of this study showed that being married with children was a significant predictor of low levels of physical activity. Another study conducted by Kamarudin and Omar-Fauzee (2007) surveyed 80 college students their perceived benefits and barriers of physical activity. One of the most frequently reported barriers to physical activity was how exercise took too much time away from family responsibilities and relationships (Kamarudin & Omar-Fauzee, 2007).

In another exercise-related study conducted by Salmon et al. (2003), over 1300 residents from the Australian province of Victoria were surveyed about the types of barriers they faced when attempting to engage in physical activity. Other variables such as sedentary behavior (ex. watching TV, talking on the phone, sitting and reading a book, etc.), preference/enjoyment for these sedentary behaviors, and participation frequency for PA were also evaluated in the survey. Results indicated that family and work commitments, complimented with preferences for sedentary activities, contributed significantly to the reduced likelihood of engaging in more than 2.5 hours of physical activity per week (Salmon et al., 2003). Yet another interesting finding in this study revealed that those who reported other commitments and priorities as barriers to exercise were 40% more likely to engage in sedentary behaviors for more than 8 hours per week (Salmon et al. 2003).

Personal Investments. The third variable of the SCM, personal investments, is described as the amount of personal resources (ex. time, effort, and money) that are being deposited into the sport activity. These personal resources cannot be retrieved upon termination of the participation in the sport activity (Scanlan, Carpenter, et al., 1993). The SCM states that the more time, money, or energy one expends on a particular kind of activity, the more committed one will be to that activity. An example of this was demonstrated in a sport setting when 537 recreational tennis players were given a survey that included all measures from the SCM in

addition to purchase behaviors of tennis equipment over the course of the year. Upon computing a correlation analysis, personal investment, commitment and purchasing behaviors variables all suggest to have influence on each other (Casper et al., 2007). This is suggestive of the notion that one's personal investment endowed within a given activity will ultimately increase the commitment of that activity (Casper et al., 2007).

Similar findings were produced when Gahwiler and Havitz (1998) administered a questionnaire to 184 members of the local Young Men's Christian Association (YMCA). Levels of social involvement, activity involvement, and aspects of participation at the YMCA were measured within the questionnaire. Results found that those who had invested the most time with activities at the YMCA also yielded highest commitment scores, while those who invested the least amount of time reported far lower commitment scores (Gahwiler & Havitz, 1998).

Social Constraints. The fourth determinant of the SCM is social constraints, which are defined as any sort of social expectations, norms, and/or pressures [from parents, coaches, or peers] that create feelings to continue participation (Scanlan, Carpenter, et al., 1993). Evidence of the belief that pressure and expectations from one's social network influences one's level of participation existed even prior to the creation of the SCM. For instance, Coakley and White (1992) interviewed 60 young adolescents regarding their experiences of their past and present engagement in sport. One recurring theme the researchers identified was the concept that without the facilitation of parents enrolling their children into sport programs at young ages, it would be highly unlikely that these youngsters would still have participated in their current sport (Coakley & White, 1992). In a more recent study involving gymnasts, Weiss and Weiss (2007), surveyed over 300 youth gymnasts to further examine possible age and competition level differences amongst the determinants from the SCM. Findings revealed that the social pressures

from best friends and parents were factors that predicted sports commitment the highest amongst the younger gymnasts from ages eight to eleven (Weiss & Weiss, 2007).

Involvement opportunities. The fifth and final dimension that predicts sport commitment and involvement opportunities are the benefits that are received through continued involvement in sport. Examples may include making new or maintaining friendships, gaining physical fitness, or learning to master a particular set of sport specific skill (Scanlan, Carpenter, et al., 1993). In a sport setting, involvement opportunities have been cited to positively influence one's level of commitment (Casper et al., 2007; Scanlan, Russell, Beals, et al., 2003). For instance, in the study conducted by Casper et al. (2007) where over 500 recreational tennis players were given an online survey, involvement opportunity measures were found to be intercorrelated with the participants' reported levels of tennis commitment. Benefits within the sport have also been the source of commitment among elite athletes. Eighty-six percent of the All Blacks, an internationally recognized rugby team, interviewed mentioned that benefits such as establishing meaningful friendships, traveling around the world to play rugby, and performance recognition had all strengthened the direction of their rugby commitment (Scanlan, Russell, Beals et al., 2003).

In a leisure activity setting, Iwasaki and Havitz (1998) describe involvement opportunities as an initial state of interest, arousal, or motivation to engage in a particular activity that consists a number of factors. Prior to getting involved in an activity, the actual amount of received social support, possible situational incentives that may be derived from the activity, societal norms, possible interpersonal constraints, and anticipated social benefits that may come about from the activity are all factors Iwasaki and Havitz (1998) consider antecedents of involvement. As the person is actually getting involved in the activity, these antecedents are

then said to be only a fraction of the components that formulate one's level of psychological commitment of the activity (Iwasaki & Havitz, 1998). A few years later, Iwasaki and Havitz (2004) then placed their proposed model to the test by administering questionnaires to nearly 300 adults who were participating in a fitness facility at a recreational service agency in Canada. Findings revealed that antecedents of involvement were positively correlated with the various measures of psychological commitment (Iwasaki & Havitz, 2004).

Other exercise related studies have also provided support the notion that benefits of exercise have indeed contributed to exercise commitment (Farrell & Thompson, 1998; Finkenberget al., 1994). For instance Farrell and Thompson (1998), and Finkenberget al. (1994) conducted studies that examined the reasons why college students begin and continue exercising habits. Overwhelmingly, students had reported the various physical and psychological benefits (ex. fitness, appearance, stress management, etc.) as reasons for beginning and continuing exercising (Farrell & Thompson, 1998; Finkenberget al., 1994).

Adaptations and modifications of the original SCM. Following the formation of the sport commitment model, several additions and modifications have taken place to supplement the understanding of one's level of commitment in a given activity. One of the first official modification of the SCM was proposed by Carpenter and Coleman (1998), who inserted supplemental theoretical determinants of commitment: perceived ability, negative affect, social and recognition opportunities (substituted for involvement opportunities), and social support. The first variable, perceived ability (aka perceived competence), is defined as the perception of how skilled one is at the particular activity (Carpenter & Coleman, 1998). Weiss and Weiss (2007) also examined the effect perceived competence has on sport commitment among young gymnasts. Correlation analyses revealed that the perceived competence variable was a

significant predictor of sport commitment (Weiss & Weiss, 2007). Such a concept has been supported in an exercise setting. For instance, Skjesol and Halvari (2005) administered a questionnaire to 188 young adults (ranging in ages 16-31) that assessed their social, cognitive, and physical perceived competence, as well as their involvement in physical activity during their spare time. Findings revealed there to be a significant and positive relationship between spare time involvement in physical activity and perceived competence (Skjesol & Halvari, 2005).

Other extensions of the SCM proposed by Carpenter and Coleman (1998) are negative affect, and the splitting of the involvement opportunities variable into two components: social and recognition opportunities. Opposite of sport enjoyment, negative affect is characterized by emotions of boredom, sadness, unhappiness, or unpleasantness that is linked with involvement in a particular activity (Carpenter & Coleman, 1998). Social opportunities refer to the extent in which establishing and maintaining friendships, having a good time, and the feeling of being a part of a team attributes to a person's continued involvement in their activity. Recognition opportunity is defined as the positive attention one receives from others for their performances in the activity (Carpenter & Coleman, 1998). Even though correlation analyses indicated that the metric concerning the negative affect variable was not significantly linked with sport commitment, the effect size suggests that those with higher negative affect scores display a corresponding decrease in sport commitment scores (Carpenter & Coleman, 1998). Multiple regression analyses also revealed that both social and recognition variables were significantly correlated with sport commitment (Carpenter & Coleman, 1998).

Yet another adaptation of the SCM was proposed by Weiss et al. (2001), who proposed changes from the original model in two ways. First, sport enjoyment becomes the mediating variable between the other determinants of commitment and sport commitment measures. In

other words, four determinants,--attractive alternatives, personal investments, social support, and social constraints--all directly influence one's level of enjoyment, which in turn directly affects sport commitment. The second adaptation consists of the involvement opportunities variable being replaced with the social support variable. This adaptation is similar to the modification proposed by Casper et al. (2007) who proposed that the five determinants of commitment: involvement alternatives, involvement opportunities, personal investments, social constraints, and social support directly influence sport enjoyment; which then directly predict sport commitment.

Two major additions were also supplemented in the construct. Casper et al. (2007) hypothesized that sport commitment is also a determinant for two behavioral components, participation frequency and purchase intentions. Participation frequency is explained by the amount in which one participates in their respective sport year-round (e.g., "How often do you play tennis in the summer?"). Purchase intentions signifies one's willingness to monetarily spend and purchase goods that are affiliated with the engagement in their particular sport (e.g., "Place a monetary value on the future purchase of sport apparel over a one-year period.") (Casper et al., 2007). Furthermore, structural model equation revealed that the proposed model is an acceptable fit (CFI greater than .90) despite the notion that the association between social support and enjoyment was deemed non-significant (Casper et al., 2007).

Social support. One of the more popular modifications of the SCM that seems to be widely accepted is the insertion of an additional determinant, social support. This variable was first asserted as a determinant of commitment by Carpenter and Coleman (1998) who defined social support as the perceptions that others support, encourage, or think it is satisfactory for them to participate in a particular activity (Carpenter & Coleman, 1998). Support for the addition to

the social support variable in the SCM was provided when findings in the study indicated that social support and sport commitment shared a significant positive correlation (Carpenter & Coleman, 1998).

Furthermore, the creators of the original model, Scanlan, Russell, Beals, et al. (2003), posited that social support, along with the five other predictors, would become the new proposed antecedents of sport commitment. Interviews rather than surveying methods took place in hopes of obtaining a better qualitative measure of the Sport Commitment Model. Out of the 15 world-class rugby players interviewed, 14 revealed that encouragement and support from various people such as family, friends, the public and the community had strengthened their level of sport commitment (Scanlan, Russell, Beals, et al., 2003).

Several exercise-related studies have also recognized the importance a social support structure has on exercise behaviors (Carron, Hausenblas, & Mack, 1996; Litt, Kleppinger, & Judge, 2002; Poole, 2001; Spanier & Allison, 2001). A meta-analysis by Carron and colleagues (1996) that involved 87 studies for a cumulative total of approximately 50,000 participants, revealed that social influences such as family members, exercise leaders, friends, and important others have a great impact on exercise adherence and attitudes towards exercise involvement. In another study that included a mass sample, an analysis of the Ontario Health Survey (N=29,135) demonstrated that social support factors were predictive of higher PA levels (Spanier & Allison, 2001).

More personalized studies where participants had more interaction with the experimenters revealed the positive effects that social support had on exercise behavior and commitment in an exercise setting (Litt et al., 2002; Poole, 2001). For instance, when 17 females over the age of 50 were interviewed to ascertain their reasons for exercising, benefits

such as social networking and support of others were reported as key factors in their commitment to exercise (Poole, 2001).

In another study facilitated by Litt and colleagues (2002), 189 older females were prescribed upper or lower body exercise workouts. To determine participation frequency of these workouts, all participants filled out a questionnaire that assessed social support for exercise and general social support unrelated to exercise. Such data was obtained by interviewing the participants every 3 months for a year. Interestingly, those who reported higher levels of social support exercised significantly more by the 12 month period. More specifically, those with greater than median level social support measures exercised for more than 19 days per month whereas those with less than median support exercised for only about 13 days per month (Litt et al., 2002).

Interventions attempting to enrich commitment. There have been intervention studies (Barnett, Smoll, & Smith, 1992; Stevens & Bloom, 2003) aiming to examine the effects a certain intervention program has on a particular determinant of the SCM. For instance, one intervention study investigated the effects a coaching effectiveness training program has on coach-athlete (i.e. social support) (Barnett et al., 1992). In this study, a total of 80 Little League baseball players played for coaches who underwent a 2 ½ hour coach effectiveness training (CET) program prior to the start of the season, while 108 played for coaches who did not attend the CET. The CET program provided proper techniques and strategies for better coaching, such as improving the coach's ability to better communicate with kids (ex. praising effort, corrective feedback, and encouragement), enhancing team cohesion and emphasizing effort and process, rather than statistics and win-loss records.

In addition, the CET program set out to de-emphasize negative coaching behavior such as punishment, non-reinforcement in response to effective performances, and exhibiting uncontrollable behaviors. Pre-season and post-season interviews were conducted to evaluate all 188 Little Leaguers' perceptions of their self-esteem (pre- and post-season), post-season views of their coach's behavior and post-season assessment of their overall sporting experience. Furthermore, telephone interviews with the Little Leaguers' parents were carried out a year later to determine the likelihood that their child will continue playing baseball again the following season (Barnett et al., 1992).

The data from this research study displayed that love for the game and self-esteem scores amongst the young ballplayers did not differ in the pre-season. However, the baseball players who played for coaches who underwent intervention (CET) yielded superior levels of coaching ratings: fun playing the game, higher perceptions of their coaches liking them, greater perceived relationships with teammates, self esteem (only for those with pre-existing low self esteem) and likelihood to want to continue participation the following season (95% vs. 74%) (Barnett et al., 1992).

Team building is another intervention that has affected the social support of fellow teammates and coaches. Stevens and Bloom (2003) conducted an intervention study to examine the impact various team building implementation had on team cohesion measures. Two separate NCAA collegiate D-I softball teams participated in a study where one team endured a series of team building mechanisms facilitated by a sport psychology consultant, while the other team acted as a control group (no team building intervention). The intervention team embarked on an assortment of programs, activities and discussions aimed to strengthen team chemistry.

Concepts such as refining individual's role and expectations, creating a positive and supportive team environment, enhancing positive social interactions, dealing with conflict, communication clarity and goal attainment were all addressed and mediated by the sport psychologist in the intervention group throughout the season. Questionnaires that measured various proponents of team cohesion were provided to both teams on five different occasions of the season.

Although there was only a statistical difference in team cohesion measures the third time, the questionnaire was administered amongst the control and intervention group. Players on the intervention team who were interviewed at the end of the season did attribute an increase in sport-specific communication clarity, as well as an overall positive team environment to the team building implementation (Stevens & Bloom, 2003). The end of the season interviews of the players provide some evidence that team building programs have the potential to augment a team's level of social support, which is a theoretical determinant of sport commitment (Stevens & Bloom, 2003).

Demographic differences. The demographics within a population have also affected different variables among the sport commitment model (Casper, 2007; Martin, 2006; Weiss & Weiss, 2007). More specifically, traits within a population such as gender, age, and skill level have all been cited to contain differed measures of certain components of the SCM. Particularly with the social constraint element, societal norms have played a role in creating gender differences in social constraint measures (Coakley & White, 1992). In the study conducted by Coakley and White (1992), where 34 young adolescent boys and 26 young adolescent girls were interviewed regarding topics of their sport involvement, one of the distinguishing factors amongst the boys and girls were the societal norms and gender roles that were being placed onto

them. For instance, the expectation to perform well for the boys seemed to be more emphasized as a way of reaffirming their manhood, while women were socialized to have sport participation as a lower priority in life (Coakley & White, 1992). Furthermore, girls reported to stress higher importance on the social aspect of sport participation, while boys reported to enjoy sport for the pure competition more frequently than the girls (Coakley & White, 1992).

Moreover, not only can gender influence measures within the SCM, but age has also been a mediating factor for sport commitment (Butcher et al., 2002; Casper, 2007; Weiss & Weiss, 2007). For instance, over 300 female gymnasts ranging from ages 8-18 were administered a questionnaire that closely resembled the SCQ. When researchers grouped the participants by age (8-11; 11-14.5; & 14.5-18), various significant distinguishing measures among the age groups were found (Weiss & Weiss, 2007). The 8-11 year olds reported higher levels of enjoyment, higher levels of social constraints as well support from parents, coaches and best friends compared the other age groups. The 14.5-18 year olds exhibited significantly higher levels of attractive alternatives in comparison with their younger counterparts (Weiss & Weiss, 2007).

In another study by Casper (2007), over 500 recreational tennis participants with a diverse age range (19-64 year olds) filled out a questionnaire concerning the components of the SCM. Differences of sport commitment determinants amongst age were then evaluated by dividing the sample into three separate age groups: 19 to 34 year-olds, 40 to 54-year-olds, and 55 to 64-year-olds. The data displayed that the youngest age group reported significantly lower levels tennis of commitment by comparison to the older age groups (Casper, 2007). Additional findings that highlighted age differences were generated by Butcher et al. (2002), where statistical analyses revealed how frequencies of dropping out of organized sport increased at seventh grade, followed by another surge in dropouts by the 10th grade. It is worthwhile to note

that these time periods demarcate a transition in schools in the Canadian school system (elementary to junior high and then junior high to high school).

In addition to gender and age demographics affecting components of the SCM, one's skill level has also been known to affect the constituents of the SCM (Casper & Andrew, 2008; Weiss & Weiss, 2007). For example, Casper and Andrew (2008) conducted comparing and contrasting measures of the SCM between collegiate tennis players and adult recreational tennis players as well as the different skill types (classified as beginner, intermediate, and advanced based on ratings of the National Tennis Rating Program [NTRP]). In the study, the researchers assessed only the four components of the SCM: sport commitment, sport enjoyment, social constraints, and involvement opportunities as predictors of sport commitment. Results indicated that collegiate athletes overall demonstrated superior scores of sport commitment, involvement opportunities, and social constraints as compared to recreational athletes (Casper & Andrew, 2008).

Supplemental findings in the study revealed that the higher one's skill level was, the higher the commitment level, involvement opportunity and social constraint measures. However, they reported lower sport enjoyment (Casper & Andrew, 2008). In a similar study, Casper (2007) also utilized a nearly identical version of the SCQ which also included the participants' involvement frequency. The participant's tennis skill level was also based on NTRP ratings; findings of the study denoted that the higher the tennis participant's skill level, the more frequently tennis was played during the year (Casper, 2007).

Weiss and Weiss (2007) also investigated differences in SCM variables amongst the different skill levels (levels 5-6 represents introductory, compulsory levels; levels 8-10 signify the highly competitive, optional levels). Researchers found that gymnasts with a lower skill

level established significantly elevated scores of sport enjoyment, involvement opportunities, teammate social constraints, and many social support measures amongst teammates, coaches, and the parents, while those with higher skill levels exhibited higher measures of attractive alternative activities, in addition to perceived high costs of gymnastics (Weiss & Weiss, 2007).

Goal Setting and Commitment

The technique of setting goals is another method that has been shown to increase one's level of commitment in a physical activity setting (Annesi, 2002; Stein & Scanlan, 1992; Sousa et al., 2008). The term goal has been defined as a level of performance proficiency that one wishes to attain, usually within a specified time period (Latham & Locke, 2006). The relationship between goal setting and commitment has been examined in a plethora of arenas such as in the education, business, and physical activity settings (Latham & Locke 2006; Locke & Latham, 2006). For instance, Locke and Latham (2006) had researched various goal setting related studies over the past 40 years. They postulated that being committed to one's goals (aka goal commitment) plays a major contributing role between setting personal goals and intentions to successfully carry out a certain task (Locke & Latham 2006).

Being committed to one's goals has been shown to influence certain aspects of one's exercising behaviors in a physical activity setting (Poag-DuCharme & Brawley, 1994; Theodorakis, 1996). For instance, Poag-DuCharme and Brawley (1994) administered a questionnaire to nearly 100 college undergraduate students enrolled in an intermediate conditioning class. The surveys were administered both at the onset of the formation of fitness goals and the subsequent five weeks. The questionnaire assessed how committed the students were to their goals (goal commitment), the degree to which goals influenced their exercise behaviors (goal influence) and exercise frequency and intensity. Although goal commitment and

exercise frequency were not significantly correlated, findings suggested that goal commitment made a significant contribution in one's exercise intensity and goal influence (Poag-DuCharme & Brawley, 1994).

Additionally, goal commitment has been shown to be a very profound component in enhancing the self-efficacy in one's motor performances (Theodorakis, 1996). In a study conducted by Theodorakis (1996), 48 undergraduate students enrolled in a tennis class performed 4 trials of 15 tennis serves all in one experimental setting. After the first two trials, participants set personal tennis serving goals and were administered a questionnaire that included measurements of their self-confidence in successfully performing the tennis serve and their perceived commitment to their goals. Results indicated that one's measure of goal commitment was significantly correlated with their tennis serve performance and self-efficacy measures (Theodorakis, 1996).

Goal setting intervention on commitment. The effects of goal setting on certain aspects of the sport commitment model have also been examined by sport and exercise psychology researchers (Annesi, 2002; Sousa et al., 2008; Stein & Scanlan, 1992; Wilson & Brookfield, 2009). Before the construction of the sport commitment model, Stein and Scanlan (1992) examined the effects goal setting has on sport enjoyment. One hundred eighty-one male adolescent recreational basketball players were provided a survey that measured seasonal basketball enjoyment and occurrences in setting universal goals, general goals, and non-goals. Universal goals include physical competence (striving to obtain higher skill levels), interpersonal relationships (conserve, rejuvenate, or create new positive relationships with others in the basketball league) and self-determination (experiencing freedom of choice to behave or act in a manner they themselves deem acceptable). General goals are a bit more descriptive compared to

universal goals which may include goals such as spending time with friends, participating in the activity, winning, acquiring new skills and/or improving performance (Stein & Scanlan, 1992). Non-goal occurrences, on the other hand, include unintended and positive occurrences that emanate during engagement in the activity and are not a part of the athlete's intended goals (Stein & Scanlan, 1992).

Upon computing stepwise regression analyses, Stein and Scanlan (1992) discovered that, even though neither non-goal nor universal goal occurrences correlated with the athletes' seasonal enjoyment, setting general-goal attainment (especially the social goals) have a significant positive correlation with seasonal enjoyment (Stein & Scanlan, 1992). Consequently, this argument provides support for the notion that setting non-specific interpersonal goals for an activity can increase one's level of enjoyment in a given activity, which will then theoretically increase one's sport commitment according to the SCM.

Goal setting has also been an intervention which involves prolonged participation in an exercise program (Annesi, 2002; Wilson & Brookfield; 2009). For instance, in a goal setting intervention study (Annesi, 2002), 100 relatively sedentary participants enrolled in an exercise program met with an exercise professional that arranged an exercise routine for three sessions per week, and gave an orientation of available equipment within the exercise facility. Participants were then instructed to meet with the exercise professional every six weeks to discuss topics on exercise prescription and physiological knowledge. Attendance of these periodic appointments and exercise output were recorded. Participants were allocated into a one of two experimental groups: control and a goal setting group. The goal setting group generated a series of 1-year exercise goals and rated how attainable each goal was, then created short-term

measurable goals every 6 weeks for 12 months. The control group, on the other hand, did not undergo any goal setting program.

By the twelfth month, there were twice as many participants still enrolled in the exercise program in the goal setting group. At that same point, over twice as many participants in the goal setting group continued to regularly attend exercise sessions in comparison to the control group (57.6% vs. 27.9%). In addition, those in the control group dropped out of regular exercise in a greater number than their goal setting counterparts (74% vs 30%) (Annesi, 2002).

In a more recent study conducted by Wilson and Brookfield (2009), 60 recreational exercisers who volunteered to enroll in a six-week exercise program were randomly assigned to three groups: 2 goal groups and a control group. The two goal groups set different types of goals, while the control group did not set any goals. Three and six months after the end of the six-week exercise program, exercise participation was monitored by keeping track of the frequency and duration of each participant's visit to the fitness club (via card swipe system of the fitness club). Findings suggested that exercise frequency and duration of those members in the goal setting groups were significantly greater than that of those in the control group (Wilson & Brookfield, 2009).

In a more direct goal setting and SCM experiment, Sousa et al. (2008) examined the effects a behavioral goal setting program for four soccer coaches has the sport commitment for their teenaged athletes. The intervention included a goal setting program in which the coaches aimed to improve the way they interacted with their athletes by either increasing their rate of encouragement or decreasing their amount of punitive remarks towards their athletes. Measurements of this study included the frequency of observed coach's feedback towards the athletes, the athletes' perceptions about these coaching behaviors, and the athletes' pre-

intervention and post-intervention measures of all variables from the original SCM. Findings indicated that the coaches generally reached their behavioral goals, while the athletes' perceptions of coaching behavior reflected actual coaching behaviors (Sousa et al., 2008). Furthermore, the athletes who perceived their coach as more encouraging reported particularly higher measures of sport commitment and sport enjoyment (Sousa et al., 2008).

Though goal setting may seem to enhance one's commitment levels, there has been a case where goal setting did not have an effect on exercise adherence (Cobb, Stone, Anonsen, & Klein, 2000). In the experiment conducted by Cobb and colleagues (2000), 104 community college students enrolled in a 16-week fitness class. They were split into three experimental groups: a goal setting group, a reading group and a control group. The goal setting group self-selected goals, developed action plans to achieve the goals and obtained feedback and evaluations regarding their fitness goals every two weeks. The reading group read self-selected health and fitness articles, and then discussed them with the researcher, as the control group did not meet with the experimenter except to collect data. After monitoring the frequency and duration of each visit to the on-campus fitness center, there were not any significant group differences in exercise attendance or duration at the fitness center (Cobb et al., 2000).

Tenants of an Effective Goal Setting Program

Although goal setting may seem to contain several benefits, it is not an absolute contingent that setting goals will elicit any benefit (Latham & Locke, 2006). In fact, there have been instances where the use of goal setting has had no effect or even an inversely negative effect on performing a task (Latham & Locke, 2006). For goal setting to maximize the aforementioned benefits, a complete and comprehensive goal setting program must be incorporated with multiple dimensions and processes (Latham, 2003; Locke & Latham, 2006). Many researchers have

suggested a number of components that are meant to accompany a goal setting program to the utmost quality: goal orientation, specificity, flexibility, difficulty, proximity, task complexity and evaluation (Kyllo & Landers, 1995; Latham, 2003; Locke & Latham, 2006). For instance, Kyllo and Landers' (1995) meta-analysis on the effects of goal setting, revealed the way in which these goal setting dimensions are utilized have a significant effect on the accomplishment of the intended task, especially in a sport and exercise setting.

Goal type. One of the dimensions to consider when setting goals is the type of goal: outcome, performance and process goals. Outcome goals are described as goals that are measured by making a social comparison; they are usually measured by winning or losing (Filby, Maynard, & Graydon, 1999). Performance goals, on the other hand, are goals that that can be accomplished relatively independent of others like running time trials (Filby et al., 1999). Finally, process goals refer to the specific behavior goals necessary for successful performances (Filby et al., 1999) and typically involve improving form, technique, and strategy. Studies have shown that process goals are the type of goals most beneficial to exercise commitment measures (Skjesol & Halvari, 2005; Wilson & Brookfield, 2009).

In the Skjesol and Halvari (2005) study, participants in a secondary school were administered a questionnaire assessing the type of goal they orient towards and the amount of involvement in physical activity. The findings showed a significantly positive correlation between being performance-oriented and engagement in physical activity during the respondents' spare time.

In the more recent study (Wilson and Brookfield, 2009), 60 recreational exercisers enrolled in a 6-week exercise program. The two goal groups in the experiment included a process goal group (ex. exercise technique or maintaining a higher heart rate) and an outcome

goal group (ex. losing weight); there was also a control no-goal group. Assessments of exercise adherence (if the participant exercised three times a week), enjoyment, effort and pressure/tension were made among every participant three and six months after the exercise program. Results showed that those in the process goal group yielded higher measures of exercise adherence and enjoyment, while experiencing lower pressure/tension compared to their outcome goal group counterparts (Wilson & Brookfield, 2009). Moreover, the outcome goal group did have higher measures of enjoyment and tension/pressure measures than the control group. Interestingly, the outcome goal group experienced a greater exercise adherence volume than the control group only during the 6-week program, while exercise adherence measures were not significantly different after the 6-week exercise program (Wilson & Brookfield, 2009).

Setting all three types of goals can also prove to be beneficial. One study that illustrated this was when Filby and colleagues (1999) examined the effects goal type has on motor skill performance and the participants' commitment towards these goals. Forty students seeking sport-related degrees performed a motor task that involved kicking a soccer ball approximately 7.6 meters away. Students had a minute and a half to score as many points as possible; points were allocated based on the proximity of the ball hitting the target. There were five goal conditions to which the students were assigned. In the outcome goal only group, participants were instructed that the task was a competition and a cash prize along with a trophy would be distributed based on performance compared to others. The process only group utilized process goals and statements that were used during their performance routines (ex. concentrate for 90 seconds, focus in on the main target, keep it low and straight), but were not told about competition. The outcome and process goal group involved a combination of the process only and outcome only group; that is, participants were informed about the competition and came up

with process goals. The fourth group, outcome performance and process group was a combination of the process and outcome goal group: they were instructed on the process goal, compete against classmates, and to aim for a personal best score. The final group acted as a control group; no goals were allocated to participants in this condition. Findings revealed that those in any of the three goal setting conditions appeared more committed to their goals over time (Filby et al., 1999). Furthermore, a second finding revealed that after controlling for skill level, those who were assigned to multiple types of goals performed significantly better than the other three groups (Filby et al., 1999).

Goal specificity. Yet another component that has shown to consistently affect goal setting effectiveness is how specific the goal is (Kyllo & Landers, 1995). Goal specificity refers to the level of clarity of the intended task that satisfies attaining the goal (Kane, Baltes, & Moss, 2001). For instance, in the Kane et al. (2001) study, 216 high school wrestlers were directed to list 3 personal pre-season, upcoming season and long-term wrestling goals. Three psychology doctoral students then rated the level of specificity for each listed goal on a 7-point Likert scale.

Approximately 9 months later, coaches reported to the researchers each wrestler's performance [win-loss] record, as well as the coach's rating of improvement for that same wrestler. Results indicate that the ratings of the wrestler's goal specificity had a significant and positive association with their next season's performance record and their ratings of improvement (Kane et al., 2001).

Many studies in exercise-setting have also indicated that specific and measurable rather than general 'do your best' goals yield more benefits (Frahm-Templar, Estabrooks, & Gyurcsik, 2003; Gyurcsik, Estabrooks, & Frahm-Templar, 2003; Poag-DuCharme & Brawley, 1994; Smith, Hauenstein, & Buchanan, 1996). For example, in the study conducted by Poag-DuCharme & Brawley (1994), nearly 100 college students listed 5 personal exercise goals and intended actions

or behavioral strategies to accomplish their goals. Participants were then given a questionnaire both at the onset and then again at the end of the five-week goal setting program. In the questionnaire, participants were asked to report a) the clarity of their goals; b) their commitment towards their exercise goals; c) how influential their goals were to their exercising behaviors; and d) the frequency and intensity of their bouts. Findings suggested that over time, as goals became clearer, participants perceived their goals to be more influential and were more committed to their exercise goals, which then predicted their actual exercise behaviors, frequency and intensity (Poag-DuCharme & Brawley, 1994).

In a more recent study, Gyurcsik et al. (2003) administered a questionnaire to 216 individuals who had arthritis and were enrolled in an aquatic exercise program aimed to build flexibility, strength, and endurance. Questionnaires that assessed the participants' perception of the difficulty and specificity of their fitness goals and self-efficacy (task and scheduling) measures were administered. Attendance in the aquatic exercise program was also monitored over the 8-week period. Results found that goal specificity was significantly and positively related to self-efficacy measures and attendance in the aquatic programs (Gyurcsik et al., 2003).

In a similar study carried out by Frahm-Templar and colleagues (2003), 85 undergraduate Kinesiology majors who engaged in regular physical activity were to rate how specific they set their fitness goals for one week (frequency, intensity, duration and type of exercise engagement). Interviews with participants also took place to obtain actual time in minutes they spent per week engaging in moderate, hard, and very hard (vigorous) PA at various times throughout the day. Results indicated that specificity ratings of their goals significantly correlated with the amount of minutes per week they spent engaging in vigorous exercise (Frahm-Templar et al., 2003).

In an intervention study, Smith and colleagues (1996) aimed to discover the relationship between goal clarity, goal commitment and performance. In doing so, 56 female undergrads enrolled in a Psychology 101-type course were asked to perform 4 trials of as many sit-ups they could do in 90 seconds on four consecutive days. Participants were randomly assigned to 4 goal conditions: two separate specific and measurable goal groups, one “do your best” group, and one control/no goal group. Not only did the performance of the sit-ups task for both specific goal groups improve at a significantly higher rate than the other two groups, but the participants in the specific goal groups also reported a higher level of goal commitment (Smith et al.,1996).

Goal flexibility. The next goal setting component that affects the effectiveness of a goal setting program is how flexible or rigid goals can be and how involved the person is in setting their own goals (Locke & Latham, 2007). Particularly in the sport setting, having self versus assigned goals appears to have an effect on the goal setting process (Getz & Rainey, 2001; Kyllö & Landers, 1995). In the study by Getz and Rainey (2001), 38 intramural basketball players shot 50 free-throws per day for 5 consecutive days. In this experiment, participants were randomly allocated to only one of two conditions: the short-term flexible goal group and the short-term rigid goal group. Findings indicated that the flexible goal group not only performed significantly better than the rigid goal group, but also improved significantly contrary to the rigid goal group who did not (Getz & Rainey, 2001).

In an exercise setting, self-set goals are also proven to be quite beneficial in comparison to goals that are assigned (Boyce & Wayda, 1994; Elston & Martin Ginis, 2004). In an experiment conducted by Boyce and Wayda (1994), 256 female university students were allocated to 3 experimental conditions: assigned goal group, self-set goal group and the ‘do your best’ control group. In the assigned goal group, long-term goals were given so that students were instructed to

improve their leg press by 80% by the end of the 12 week-class, while short term goals involved increasing weight by one plate if 2 sets of 10 repetitions were lifted for 2 straight class periods.

The self-set goal group was required to set short-term goals and record them (as well as actual performances) while the control ‘do your best’ group did not have any specific or measureable goals to report. Aside from evaluating the amount of weight lifted during a leg press exercise, self-motivation was also measured at different points of the class. Among all participants, motivation measures changed little over time, although results indicated that the assigned goal group performed significantly better than the other 2 groups (Boyce & Wayda, 1994).

In another more recent experiment, Elston and Martin Ginis (2004) conducted a study of 50 adults belonging to a local fitness center. The participants were asked to perform two separate grip tests, three minutes apart from each other. After not seeing the results of the first grip test, a questionnaire was administered that measured perceptions of self-efficacy for various physical abilities; the measures experimenters utilized gripping abilities in data analysis for self efficacy. Participants were divided into two groups: the self-set goal group and the assigned goal group. Those in the self-set goal group were asked to set their own goal in pounds for the next grip strength, while those in the assigned group were told to improve grip strength by 12%. Though grip strength for both groups did not differ, participants in the self-set goal group reported significantly higher measures of self-efficacy than those in the self-set goal group (Elston & Martin Ginis, 2004).

On the contrary, there have also been instances when pre-determined goals triumphed over self-set goals (Boyce, Wayda, Johnston, Bunker, & Eliot, 2001). In an undergraduate physical education setting, 156 students in an undergraduate tennis class performed 6 sessions of 10 trials

over the course of a 15-week period where they had to perform a tennis serve. Participants were given points (1-10) based on the speed and accuracy of the serve. Participants were randomly assigned to one of three conditions: instructor-set short- and long-term goals (where the participants' goal was to improve their serve score by 50% by the end of the 15-week session by increasing their serve score by 10% every subsequent session); self-set short-term and long-term goal group (where participants set their own goal serve score just prior to each session); and the 'do your best' control group (where participants were instructed to "do their best"). By the conclusion of the entire class, though both goal groups significantly outperformed the control group, the instructor-set group served statistically superiorly in comparison to the self-set group (Boyce et al., 2001).

Goal difficulty. Aside from goal specificity and flexibility, the perceived difficulty level of the goal is also important when setting goals. Though generally speaking, goals are believed to be most effective when they are moderate to challenging and attainable (Latham, 2003, Latham & Locke, 2006; Locke & Latham, 2006). There have been conflicting findings as to exactly what level of difficulty goals reach maximum effectiveness. However, in the sport and exercise psychology literature, setting higher and challenging, yet attainable, personal goals have yielded greater goal setting benefits (Kyllo & Landers, 1995). In the meta-analysis by Kyllo and Landers (1995), moderate goals had more of an impact in the studies included in the analysis than easy, difficult and improbable goals.

However, in the last 15 years, findings regarding the precise level of effectiveness for goal difficulty are somewhat inconsistent (Bar-Eli, Tenenbaum, Pie, Btsh, & Almog, 1997; Gyurcsik et al., 2003; Mooney & Mutrie, 2000; Tenenbaum, Bar-Eli, & Yaaron, 1999). For instance, in the Gyurcsik et al. (2003) study, perceived difficulty of the goals the arthritic adults set for the

subsequent week, month and year was assessed. Attendance for how many times they showed up to the aquatic exercise classes over an 8-week period were also monitored. Interestingly, findings suggested that there was a significant, yet negative, correlation between perceived goal difficulty and attendance (Gyurcsik et al., 2003).

There have also been times where easier goals have been shown to improve performance (Mooney & Mutrie, 2000). In the study conducted Mooney and Mutrie (2000), 46 Scottish children in primary school performed a pre- and post-test of 20 trials of badminton underhand serves and drop shots. A maximum of three points per hit were awarded depending on the proximity the shuttle landed in the prescribed target. Participants were randomly allocated to 3 separate experimental groups: the easy goal group, whose goal was to improve their score by 10% from baseline; the difficult goal group, whose goal was to improve their score by 40%; and the control 'do your best' group. Results revealed that only the easy group improved significantly over time (Mooney & Mutrie, 2000). An additional finding also suggested that those 12-years-old and over seemed to have improved more in the goal groups than their younger counterparts.

In a conflicting finding by Bar-Eli and colleagues (1997), 346 high school freshman and sophomore Israeli students performed as many sit-ups as possible in 2 minutes under five separate experimental conditions. The easy goal group was instructed to improve their baseline sit-up score by 10%, the difficult/realistic goal group by 20% and the improbable/unattainable goal group by 40%. There was also a 'do your best' goal group and a control group, which were simply asked to perform sit-ups for 2 minutes. Participants practiced sit-ups twice a week until the post-test. Results showed that overall, the greatest rate of improvement was accomplished by the difficult/realistic group, followed by the easy goal group, improbable/unattainable goal group, the control group, then the 'do your best' goal group, respectively (Bar-Eli et al., 1997). However,

using the same data Tenenbaum and colleagues (1999) used, Bar-Eli et al noted that improvements rates differed among each group depending on how much practice participants were given. More particularly, the difficult/realistic goal group improved the most when practicing for 4 weeks, the easy goal group improved their sit-up scores most when practicing for 6-8 weeks. (Tenenbaum et al., 1999).

Goal longevity. The fourth goal dimension that affects the effectiveness of a goal setting program is goal proximity, which is defined as the temporal nature of goals, short- or long-term (Corrêa, De Souza, Jr., & Santos, 2006). Goal proximity is said to be beneficial not only because it provides additional information on a person's current performance status in relation to their overall long-term goal, but it also provides more focus on the more immediate strategies and skills needed for goal attainment (Kyllo & Landers, 1995; Latham, 2003; Latham & Locke, 2006). It seems clear that past research in sport and exercise literature remains constant when utilizing both long- and short-term goals simultaneously in a goal setting program that yields advantages (Kyllo & Landers, 1995). For instance, in the meta-analysis consisting of eight goal setting experiments in sport and exercise studies, setting combined short-term and long-term goals had more of an effect on the intended task than setting long-term goals or short-term goals alone (Kyllo & Landers, 1995).

In another study that demonstrated the effects goal proximity has on confidence, effort, and performance, Frierman, Weinberg, and Jackson (1990) examined 72 intermediate and novice bowlers in an undergraduate physical education class who bowled four games a week for six consecutive weeks. Participants in the group were randomly assigned to four goal setting conditions: the short-term goal group (two pin score increase per week relative to the baseline score), the long-term goal group (10 pin score increase relative to the baseline score by the end of

the fifth week), combined long- and short-term goal group (conditions applied from the short and long term goal group), and the control “do your best” group. Aside from measuring performance (bowling scores), questionnaires were distributed to all participants that assessed the bowlers’ perceptions of how difficult the goal was to attain, the amount of effort given to attain the goal and the amount of confidence they had when pursuing the goal.

Overall, those in the long-term group not only had a higher percentage of participants reaching their goal, but they also improved performance the most in comparison to the other four groups (Frierman et al., 1990). In addition, those in the long-term goal group reported more confidence in attaining their goals and felt that their goals were less difficult. Conversely, those in the control group yielded the lowest amount of improvement, reported a decreasing amount of effort for bowling performances and significantly less confidence than the other three groups, providing evidence to suggest that goal proximity can have an effect on performance, confidence, and effort (Frierman et al., 1990).

However, other articles in sport psychology literature have also produced contradicting findings where goal proximity has not yielded significant results (Corrêa et al., 2006; Getz & Rainey, 2001). For instance, in the Corrêa et al. (2006) study involving participants performing a volleyball forearm pass to an intended target, there were two distinct long-term and short-term goal conditions. In the long-term goal group, participants were instructed to improve their performance by 120% than their pre-test score, while those in the specific short-term goal group were instructed to improve their score by 30% than their previous session. Findings failed to produce significantly distinguishable results among the short- and long-term group (Corrêa et al., 2006).

In another experiment to explore the effects short- and long-term goals have on immediate basketball shooting tasks, 39 college intramural basketball players performed five foul shooting trials once a day for five consecutive days (Getz & Rainey, 2001). Each trial consisted of 50 shots from the free throw line, 15 feet away from the basket. Participants were randomly assigned to three goals conditions: the long-term goal group (increasing their free throw percentage by 40% by the end of the 5th trial); the rigid short-term goal group (continually increase shooting percentage by 10% following the baseline trial); and the flexible short-term goal group (increase shooting percentage 10% more than previous trial). Results failed to show that both short-term goal groups performed significantly better than the long-term goal group (Getz & Rainey, 2001).

Feedback and evaluation. The final element that supplements effectiveness of a goal setting program is periodic evaluations of the goal setting process that includes feedback. Goal setting evaluations allow individuals to properly adjust goal attainment strategies and the level or direction of effort being put into these strategies (Locke & Latham, 2007). Particularly in the sport and exercise setting, the effects of goal evaluation with feedback have positively impacted the way in which people behave and perform (Annesi, 1998; Malliou, Beneka, Ginnekopoulos, Aggelousis, & Theodorakis, 1998; Theodorakis, Laparidis, Kioumourtzoglou, & Goudas, 1998; Zimmerman & Kitsantas 1996).

In an experiment that suggests that the use of feedback improves motor performance, 40 undergraduate Physical Education student-athletes performed 6 maximum repetitions of lower body eccentric and concentric exercises (Malliou et al., 1998). Muscle torque was measured three sessions per week for four weeks. Participants were divided into two different experimental groups: the goal group set a written personal goal before each performance trial and was also given feedback on previous performance trials. The other group acted as a control group where

goals were not set, nor was performance feedback given. Results revealed that those in the goal setting conditions increased performance at a higher rate than those in the control group (Malliou et al., 1998).

In a similar study conducted by Theodorakis et al. (1998), 42 Physical Education majors in college performed a fitness test involving the ergometer bicycle. Participants were divided into two separate conditions. Those in the goal group were given feedback on the first trial and were then instructed to report a specific goal to increase performance. Those in the control group were instructed to perform their best and were not provided any sorts of feedback regarding their fitness performance. Performances were based on how long the participants could last (in seconds) on an ergometer bike while increasing resistance 30 watts every three minutes, starting with 60 watts. Additionally, the participants' heart rates were measured during the exercise trials. Findings showed that the goal group improved their cycling performance at a significantly higher rate when compared to their control group counterparts (Theodorakis et al., 1998). Another finding revealed that participants in the goal group on average had a higher maximum heart rate and a lower heart average heart rate during exercise in comparison of participants those in the control group (Theodorakis et al., 1998).

Besides just merely providing feedback and evaluations regarding one's exercise goals, the quality of the feedback and evaluations can also have an impact on one's exercising behaviors (Annesi, 1998). In a study by Annesi (1998), 164 adult members of a fitness center who had not exercised regularly for the past 6 months were randomly allocated into two experimental conditions. One group utilized a computer feedback program called FitLinxx. The FitLinxx tracks individuals' exercising progress, which include programs that display elements of exercise such as the amount of weight lifted, pace of repetition completion and the number of

repetitions/sets, the speed and range of motion of exercise, amount of time working out, calories expended, type of workout completed, etc. In the other control group, participants just merely tracked their exercise progress manually with a pencil and paper (tracking cards). During the subsequent 32 weeks, exercise attendance to the fitness center was tracked. Findings revealed that the treatment group yielded a significantly higher percentage of exercise attendance and attended the fitness center longer before dropping out in comparison to those in the control group (Annesi, 1998).

Furthermore, having feedback on one's performance has shown to make an activity seem more appealing (Zimmerman & Kitsantas, 1996). For example, in an experimental study facilitated by Zimmerman and Kitsantas (1996), 50 female high school freshmen and sophomores performed a motor task involving dart throwing. Participants were divided into groups that either recorded their scores in a log after each practice trial or groups that did not record their scores. Performance scores of six dart throws were recorded after participants had practiced dart throwing for 12 minutes. Aside from dart scores (of 6 throws), measures of self-perceived capabilities and self-satisfaction with dart throwing were also assessed. Findings revealed that the self-recording group not only outperformed the non-self-recording group, but had also reported higher self-efficacy and satisfaction of dart throwing measures compared to their non-self-recording counterparts (Zimmerman & Kitsantas, 1996).

The Sport Commitment and Exercise Commitment Questionnaires

Sport commitment questionnaire (SCQ). In hopes to validate the sport commitment model, a series of plural correlations (Scanlan, Carpenter, et al., 1993), structural equation modeling (Carpenter et al., 1993), and reliability test scores (Scanlan, Simons, Carpenter, Schmidt, & Keeler, 1993) were computed in order to legitimize a method to measure aspects of

commitment in a physical activity setting. In the first study that introduced the SCM, a questionnaire was assembled and administered to 178 boys and girls from diverse socioethnic backgrounds who were involved in Little League programs (Scanlan, Carpenter, et al., 1993). The questionnaire was comprised of 28 items that were measured on a five-point Likert scale rating from “not at all” to “very much.”

Each item of the questionnaire had addressed one component of the SCM. Six of the items addressed sport commitment and asked questions such as “How dedicated are you to playing little league?” Four items pertained to sport enjoyment which contained statements such as “Do you enjoy playing little this season?” Four items related to involvement alternatives which asked questions such “How much would you like to do this activity, instead of playing Little League?” Three items of the personal investments component included questions such as “How much time have you put into playing in Little League this season?” Seven items relevant to social constraints consist of questions such as “I feel I have to stay in Little League so that people won’t think I’m a quitter.” And finally four items corresponding with involvement opportunities posed statements such as “Would you miss the good times you would have had playing Little League this season if you left Little League?”

Chronbach’s reliability alpha coefficient was utilized in order to test the reliability measures for each SCM variable: sport commitment ($\alpha=.85$), sport enjoyment ($\alpha=.94$), social constraints ($\alpha=.80$), involvement opportunities ($\alpha=.81$), and personal investments ($\alpha=.50$) (Scanlan, Simons, et al., 1993). Due to the fact the researchers were surveying children, the items regarding personal investments had to be altered because it was the parents (not the child) who invested money in the child’s sport participation. Following proper modifications of the personal investment portion of the questionnaire, the alpha coefficient for personal investments

became $\alpha=.66$ from what original reliability measures $\alpha=.50$. Assessment of the involvement alternatives became problematic because 12% of the participants left that portion of the questionnaire incomplete by failing to list any alternative activities, so researchers then decided to drop the variable entirely from further statistical analyses. As a result, all sport commitment determinants, except for social constraints had significant correlations with sport commitment (Scanlan, Carpenter, et al., 1993).

The questionnaire was then further modified (Scanlan, Carpenter, et al., 1993). This time, only one item was used to measure involvement alternatives and two additional social constraint items were eliminated in order to simplify the construct. One thousand, three hundred forty-two football, soccer, and volleyball youth participants were given the newly modified questionnaire (two more alternative involvement and two more social constraint items were eliminated) to once again assess reliability measures. All items within the construct reached an alpha coefficient above $\alpha=.80$, suggesting that all items were reliable.

Since the initial procedures of validating and legitimizing the SCQ as a measurement tool for the SCM, several studies have recalculated comparative fit indices for the model and tested reliability measures of the SCQ. Over the past two decades many versions of the SCQ have been utilized among those samples who are not necessarily youth participants of sport. Such sample pools include middle-aged recreational sport participants (Casper & Andrew, 2008; Casper et al., 2007), healthy adults engaging in exercise (Alexandris, Zahariadis, Tsorbatzoudis, & Grouios, 2002), sport coaches (Raedeke, 2004; Raedeke et al., 2002; 2004), and referees of sport (VanYperen, 1998). Accompanying a diverse population is a fairly inconsistent reliability measures across the studies that have utilized the SCQ. In particular, reliability measures for the SCQ ranges from $\alpha=.76$ (Sousa Torregrosa, Viladrich, Villamarín, & Cruz., 2007) to $\alpha=.89$

(Scanlan, Carpenter, et al., 1993); $\alpha=.78$ (Raedeke et al., 2000) to $\alpha=.97$ (Casper & Andrew, 2007) for enjoyment/satisfaction; $\alpha=.41$ (Sousa et al., 2007) to $\alpha=.88$ (Weiss et al., 2007) for personal investments; $\alpha=.69$ (Raedeke et al., 2000) to $\alpha=.88$ (Scanlan, Carpenter, et al., 1993) for social constraints; $\alpha=.52$ (Sousa et al., 2007) to $.91$ (VanYperen, 1998) for involvement opportunities; $\alpha=.66$ (Sousa et al., 2007) to $\alpha=.92$ (VanYperen, 1998) for involvement alternatives; and $\alpha=.74$ (Casper et al., 2007) to $\alpha=.87$ (Weiss & Weiss, 2003) for social support.

Exercise commitment scale (ECS). Roughly a decade later, Wilson and colleagues (2004) developed a similar version of the SCQ by adapting its constructs to an exercise setting and calling it the Exercise Commitment Scale (ECS) (Appendix A). Containing a total of 34 items, the ECS contains most of the original SCQ's constructs: commitment (9 items), enjoyment (3 items), involvement alternatives (5 items), personal investments (4 items), social constraints (4 items), and involvement opportunities (6 items).

There are a few adaptations that accompany the ECS other than the changing of the wording within the questionnaire to accompany an exercise related activity instead of a sport related activity. First, all questions in the ECS are rated on a 10 point Likert scale instead of a five point Likert scale. Secondly, the commitment component of the questionnaire is split into two: want to commitment (6 items) and have to commitment (3 items); the number of items in the ECS thus totaled 34. Want to commitment is described as a functional resolve to continue exercise, while have to commitment is described as an obligatory resolve to continue exercise (Wilson et al., 2004). Thirdly, there is an additional variable, social support which included only three items that post statements like "People who are important to me encourage my exercising".

The ECS was first distributed to 428 university students enrolled in exercise classes in hopes to obtain acceptable reliability and correlations among the variables within the

questionnaire. All involvement opportunity items in the study were omitted from further analysis due to the developers' notion that aspects of involvement opportunity questions often overlapped with the other constructs of the ECS (Wilson et al., 2004). All variables reached acceptable reliability measures above $\alpha=.80$ with the exception of items within the have to commitment and social support constructs, of which reached $\alpha=.71$ and $\alpha=.73$ respectively. Furthermore, all predictors of [want and have to] commitment were significantly correlated with [want and have to] commitment, with the exception of the correlation between involvement alternatives and have to commitment (Wilson et al., 2004). In addition, the determinants of commitment and the commitment indices themselves provided to be a moderate-to-strong fit (CFI=.96) (Wilson et al., 2004).

Another study employed only certain parts of the ECS (involvement opportunities and involvement alternatives were excluded in the questionnaire) to determine the relationship among the ECS variables along with exercise behaviors (Gabriele et al., 2005). The questionnaire was distributed to 244 adult exercise participants recruited from various health clubs, campus organizations, and university classes. All determinants of the ECS were significantly correlated with [want to and have to] commitment with one exception; social constraint had a weak correlation with have to commitment (Gabriele et al., 2005).

Measuring Aerobic Fitness

12-minute walk/run Cooper test. One way to measure aerobic (endurance) fitness is by administering the 12-minute walk/run test (AKA the cooper test). First developed by Cooper (1968), this fitness test aims to assess one's maximal oxygen intake ($VO_2\text{max}$) by evaluating the maximum distance one has walked or ran in a twelve minute time period. Recent studies have provided partial validation for the test (Calders et al., 2008; Weisgerber et al., 2009). For

instance, in a study conducted by Calders et al., 2008, anthropometrical measurements such as body mass index (BMI), fat mass, fat free mass were measured among 64 obese adolescent children. Also administered was a maximal exercise test using a cycle ergometer to determine $VO_2\text{max}$. The 12-minute run test was then finally administered to examine any correlations between results from the cooper test, the cycle ergometer protocol, and the anthropometrical measures. Findings indicated that the distance covered during the 12-minute methods was significantly correlated with the anthropometrical data, $VO_2\text{max}$, and peak power from the ergometer test (Calders et al., 2008).

In another study conducted by Wesigerber et al. (2009), 45 asthmatic children performed the Cooper 12 minute walk/run test as well as the treadmill fitness test. The treadmill fitness test was carried out by increasing the speed of the treadmill every three minutes until exhaustion. Fitness tests were completed on either a cycle ergometer or a treadmill. Findings revealed that the fitness results from the Cooper 12 minute walk/run and the treadmill fitness test were moderately correlated as measures of cardiorespiratory fitness (Wesiberger et al., 2009). It is also worthy to note that the review of literature in this study included 11 other studies that compared $VO_2\text{max}$ measures of the Cooper fitness test with other various fitness tests including the 20 meter shuttle run (AKA the beep test), 6-minute run, 15-minute run, and the one mile run; all of which were completed on either a cycle ergometer or a treadmill. The review revealed that the correlations between the Cooper test and the other tests ranged from moderate to strong (Weisberger et al., 2009).

Summary

Though there are multiple benefits that are derived from exercising (Farrell & Thompson, 1998; Finkenberget al., 1994), reasons for discontinuing exercise remain prevalent

in people's lives (Anderson, 2003; Kamarudin & Omar-Fauzee, 2007). Several theorists have attempted to explain the psychological functions that drive exercise behaviors (Bandura, 1977; Ajzen & Madden, 1986). Commitment behaviors have been exhibited by various actions such as the frequency, intensity, and duration at which one exercises (Gabriele et al., 2005; Pini et al., 2007; Wilson et al., 2004).

One particular group of researchers formulated a commitment based theory known as the sport commitment model (Scanlan, Carpenter et al., 1993). The model postulates that continuing participation in a given activity is contingent upon five factors: enjoyment, involvement alternatives, personal investment, social constraints, and involvement opportunities (Scanlan, Carpenter et al., 1993). Since the formulation of the theory, many have proposed modifications of the theory, for instance, by adding social support as an extra determinant (Scanlan, Russell, Beals et al., 2003; Weiss & Weiss, 2003; 2007). The theory has also been applied in exercise setting (Alexandris et al., 2002; Gabreile et al., 2005; Wilson et al., 2004).

The implementation of goal setting has been known to enrich one's commitment level to one's intended task (Locke & Latham, 2002), especially in an exercise setting (Annesi, 2002; Kylo & Landers, 1995; Wilson & Brookfield, 2009). Because there are occurrences when a generic goal setting program fails to significantly improve performances, it is paramount that one takes the appropriate steps to prevent shortcomings when setting goals (Latham & Locke, 2006). Much research has been conducted that has shown how a certain aspect of goal setting can affect one's performance. More particularly the type of goal that is set (Wilson & Brookfield, 2009), the specificity or measurability of the goal (Smith et al., 1996), the flexibility of the goal (Elston & Ginis, 2004), the difficulty of the goal (Mooney & Mutrie,

2000), the longevity of the goal (Frierman et al., 1990), and evaluations of the goal (Annesi, 1998) can all have a positive effect on one's performance, commitment, and self-efficacy measures.

Also included in this literature review were the specific methods which to evaluate commitment in the physical activity setting, and means to evaluate aerobic fitness. Questionnaires such as the sport commitment questionnaire (SCQ) and the exercise commitment scale were developed in hopes to evaluate one's level of sport commitment and exercise commitment respectively (Scanlan, Simons et al., 1993; Wilson et al., 2004). Furthermore, the Cooper 12 minute walk/run test was developed to evaluate aerobic fitness by calculating one's maximal oxygen intake (Cooper, 1968). Recent studies have provided evidence to suggest that this Cooper 12 minute walk/run test is a valid measure of maximal oxygen intake as well as cardiorespiratory fitness (Calders et al., 2008; Weisgerber et al., 2009).

Finding methods to maintain steady exercise habits is paramount to one's physical and mental health. Engaging in consistent exercise routines can often be a challenge with time constraints and other commitments. Setting personal fitness goals can be an extraordinarily effective guidance tool for establishing and staying committed to a particular exercise regimen or program. By closely examining concepts of goal setting and exercise commitment, a better understanding of how the two concepts can work hand in hand to overcome exercise barriers and continue the pursuit to a lifelong healthy lifestyle.

Chapter III

Methods and Procedures

Introduction

The purpose of this study was to examine the effects of a goal setting program on exercise commitment and aerobic fitness of university students. More specifically, the purpose of this study was to examine the effects of a goal setting program on the components of exercise commitment (want to commitment, have to commitment, enjoyment, social constraints, involvement opportunities, involvement alternatives, personal investments and social support), exercise frequency and duration, and aerobic fitness (performance on the Cooper 12 minute Cooper fitness test).

A two-way between-within experimental design was implemented in this study involving two separate physical education activity classes (beginning jogging). One of the classes was assigned to the treatment (goal setting) group and the other group was assigned to the control group. Participants in the treatment group underwent a goal setting program consisting of educational, forming, and evaluative processes for pursuing a fitness goal. Analyses of variance (ANOVAs) (Vincent, 2005) were calculated to determine the effect of the goal setting program on: a) exercise commitment as measured by the Exercise Commitment Scale (Wilson et al., 2004); b) exercise behaviors as indicated by the frequency and duration of exercise (days and hours per week spent on exercising); and c) aerobic fitness as measured by the Cooper 12 minute walk/run test (Cooper, 1968).

Description of the Study Population

The population for this study was comprised of two physical education activity classes (jogging classes) at Western Washington University. The control group started out with 33

students while the experimental group began with 32 for a combined 65 participants. Only 26 (N=26) participants in the control group and 24 (N=24) in the experimental group were included in the data analysis. There were a few reasons why those were not included in the data analysis. The reasons include: not completing any pre or post test measures, not attending classes regularly, or had participated in multiple marathons in a year. For exact criterion on why an individual was omitted in the study, see appendix B.

Design of the Study

The design of this study was a two-way between-within ANOVA experimental design comprised of students enrolled in the two physical education activity classes (beginning jogging classes). The experimental group engaged in a comprehensive goal setting program (treatment group), while those in the control group did not participate in the goal setting program. Comparisons between each exercise commitment measure, exercise frequency and duration, and fitness levels were made during the second and last week (10th week) of class sessions.

Data Collection Procedures

Instrumentation. After obtaining written consent to participate in the current study (Appendix C), participants identified their demographic variables such as age, gender, class standing, course credits being taken in the term the study was conducted, number of hours per week employed, and past running experiences (Appendix D). A total of three instruments were utilized for data analysis: the exercise commitment scale (ECS) (Wilson et al. 2004) (Appendix A), the physical activity log (Appendix E), and the Cooper 12 minute walk-run test norms (Appendix F).

The ECS is a questionnaire developed by Wilson et al. (2004) that consists of a total of 34 questions rated on a 10-point Likert scale representing 8 variables. The 8 variables

represented in the ECS and their Cronbach's reliability measures according to Wilson et al. are: satisfaction ($\alpha=0.86$), social constraints ($\alpha=.82$), personal investment ($\alpha=0.94$), involvement alternatives ($\alpha=0.86$), social support ($\alpha=.073$), have to commitment ($\alpha=0.71$), want to commitment (0.95), and involvement opportunities respectively. When administered, students were instructed to read each question, and then to circle the response that corresponded to how they typically felt about exercise. The groups of questions representing each variable were averaged resulting in a score (based on the Likert scale) that exhibits the participant's score for that particular variable. These averaged scores of each variable were then averaged among those participants in the treatment group, and then separately averaged among those in the control group. The averaged score from each of the eight variables among the treatment and control group was utilized for data analysis.

Due to the notion that exercise frequency and exercise duration act as behavioral resultants of exercise commitment (Gabriele, Walker, Gill, Harber, & Fisher, 2005; Wilson et al., 2004), the second portion of the questionnaire in this study addressed the amount of time spent per week exercising (Appendix E). Students were directed to list a) all moderate to vigorous physical activity they engaged in for at least 30 minutes during the previous seven days, b) the accumulated duration of each engagement of physical activity per day, and c) whether the form of physical activity for that day was moderate or vigorous. Exercise frequency and duration was derived from each participant's reported number of days per week engaging in continuous moderate to vigorous physical activity for at least 20-30 minutes (depending if the participant reported to have engaged in moderate or vigorous physical activity). In addition, exercise duration was calculated by summing the self-reported total daily number of minutes spent engaging in moderate to vigorous physical activity. A physical activity guide for what

constitutes moderate and vigorous physical activity was also given to participants to aid distinguishing moderate and vigorous physical activity (United States Department of Health and Human Services, 2008) (Appendix E).

The third assessment utilized in this study was the Cooper 12-minute walk/run test (Cooper, 1968) that took place on a standard 400 meter track. In this test, students were instructed to walk and run as much distance as possible in 12 minutes. Because completing four laps on lane number 3 on a standard 400 meter track measures closest to one mile, students were instructed to remain in lane 3 for the entirety of the fitness test. The number of laps (to the nearest $\frac{1}{4}$ lap) was self-reported to the investigator who was conducting the test. The total distance in miles walked or ran were utilized for data analysis. The standards and norms for the Cooper 12-minute walk/run test appear in Appendix F and were distributed to participants after completing the fitness test.

Discussion of measurement techniques and procedures. Two separate university level physical education activity classes (beginning jogging courses) were allocated to two separate experimental groups, a treatment and a control group. The treatment group underwent a goal setting program, while the control group did not undergo the goal setting program. The experimenter of the study was the instructor of both jogging courses. Both groups met on separate days during the Fall academic quarter of 2010: the control group met every Tuesday and Thursday mornings at 8:00am, and the experimental group every Monday and Wednesday mornings at 9:00am. Due to the holidays of Veterans day and Thanksgiving day, the control group did meet for class on both of those holidays, thus having two less class sessions than the experimental group.

At the first class session of the 10-week beginning jogging class, permission and consent forms to participate in the current study were distributed to participants in both the control and treatment group (Appendix C). All study participants then filled out a questionnaire recording demographic variables such as age, gender, class standing, number of credits enrolled, and number of hours employed per week (Appendix D).

During the second class session (beginning of week 2), participants in both the control and treatment group completed the Exercise Commitment Scale (Appendix A) in which they were told to circle the response that corresponded most with how they typically felt about exercise. Immediately after completing the Exercise Commitment Scale, students were instructed to complete and submit the physical activity log sheet (Appendix E) which asked participants to report the number of days and minutes spent engaging in moderate to vigorous physical activity over the previous 7 days. After filling out the Exercise Commitment Scale and the physical activity log sheet, all participants were administered the 12-minute walk/run Cooper Fitness Test.

In this fitness test, participants were instructed to run, jog, or walk as many laps as possible around a standardized 400-meter track. The experimenter recorded the time and reminded students how much time was left periodically throughout the fitness test and instructed them to stop running as soon as 12 minutes had expired. Participants were instructed to keep track of the number of laps they completed after 12 minutes. The number of laps (rounded to the nearest quarter-lap) was then self-reported by the participants immediately after the termination of the fitness test. The experimenter then converted the number of laps to the total amount of miles they completed in the 12 minutes for data analysis.

On the third class session each participant in the treatment group commenced the goal setting program which encompassed 3 components: a) the education component of basic goal setting concepts b) the creation of individual self-set aerobic fitness goals and c) an ongoing evaluation of set exercise goals. For a class session by class session overview of the measurement techniques, procedures, and schedule, see Appendix G.

On the first day of the goal setting program (third class session), participants in both groups were introduced to the American College of Sports Medicine (ACSM) exercise guidelines (Appendix H). These ACSM guidelines recommend that individuals engage in moderately intense aerobic physical activity for 30 minutes a day, five days a week or engage in vigorously intense aerobic physical activity of 20 minutes a day, three times a week. Alternatively, one can also meet ACSM exercise guidelines by engaging in moderately intense aerobic activity 30 minutes per bout, twice a week while simultaneously exercising at a vigorous intensity for 20 minutes two other times during that same week (Haskell et al., 2007). Since the jogging class met twice a week for vigorous aerobic activity for at least 30 minutes, students were advised to meet ACSM exercise guidelines by engaging in at least two more aerobic exercise bouts outside of class time.

Following a brief explanation of the ACSM guidelines (Haskell et al., 2007), only participants in the goal setting group received information and educational strategies regarding the concepts and applications of time management, goal setting, and individual aerobic fitness goals. First, instructions were given to students on how to complete the time management worksheet (Appendix I). The time management strategy utilized in the experiment was based on the seven steps suggested by Vernacchia (2003). First, students were told to create a list of activities they intended to accomplish throughout the week, then to prioritize those activities.

Participants were then instructed to block these prioritized activities on the on the time slots in the worksheet. To meet ACSM exercise guidelines, participants were reminded to block at least two extra timeslots outside of class time where they can exercise aerobically. They were then encouraged to visualize successfully accomplishing these listed activities and to review their time management sheet throughout the day. Subsequently, they were directed to check off the activities (on their list of activities) once they were successfully achieved. Finally, participants were instructed to begin the process over again by giving activities not completed a higher priority for the next day. After instructions were given on how to complete the time management worksheet, the participants were instructed to complete and submit it by the next class session (day 4; third week of class).

Following the discussion on time management, a handout coupled with the instructor's lecture explaining the meaning, importance, and suggestions for effective goal setting strategies were given to all participants in the treatment group (Appendix J). Immediately following the goal setting presentation, the experimenter facilitated the formation of an individual goal setting plan with the participants by guiding them through the 8-step goal setting construction worksheet (Appendix K). The experimenter instructed the students to complete the worksheet outside of class time and then briefly reviewed and guided the participants on how to properly answer each question. First, the participants were instructed develop a general aerobic fitness goal that they would like to attain by the end of the quarter. In the next prompt participants were instructed to specify the goal by developing with a more measurable and a realistically challenging goal. Next, participants in the goal-group were asked to identify and select as many enjoyable exercise activities they could engage in that would be conducive to their goal attainment. The next prompt asked the number of times a week and for what duration they would engage in their listed

activities that are conducive to attaining their aerobic fitness goal on a previous question (question #3). To answer this question, the participants were directed to refer to their time management sheet (Appendix I).

The last four prompts of the goal setting construction form involved issues of social support, overcoming speculative goal inhibitions, formulating a short term goal, and creating a daily plan for carrying out the intended aerobic exercises. More specifically, question number five guided participants to seek another person that could help them attain their goal such as a friend, teammate, family member, and/or a person with whom they could consistently exercise. The sixth prompt merely asked what sorts of challenges the participants may foresee and how they would overcome that challenge. The 7th question prompted students to create a short term goal that should be pursued for the next seven days. The 8th and final question prompted participants to complete a chart that provided the activities in addition to the duration and intensity of the activities they intended to engage in during that week. The experimenter then instructed the participants to submit the goal setting construction sheet and time management sheet by the beginning of the next class session (4th class session).

On the fifth class session (one week after the educational portion of the goal setting program), the instructor returned the goal setting construction worksheet as well as the time management sheet to the participants with appropriate typewritten feedback regarding their goal setting action plan. Typewritten comments mostly consisted of suggestions for more effective goal attainment strategies. Afterwards, those in the treatment group received instruction regarding how to complete the goal setting evaluation sheet (Appendix L) and were then instructed to return it to the instructor at the beginning of the next class session (6th class session).

This worksheet includes a series of reflective, evaluative, and behavioral seeking questions regarding their previously set goals and exercise behaviors.

The first four questions were predominantly reflective. For instance, the first question on the worksheet merely asked whether they achieved their weekly short term goal they set on the previous week. The other three reflective questions on the worksheet inquired about the fitness exercises they engaged in as well as the amount of social support and types of challenges they faced during the past week. These three questions also directed the participants to improve their goal attainment strategies like seeking increased social support, coming up with strategies to overcome exercise challenges, and possibly change fitness exercises if necessary. The fifth question guided the participants to set yet another short term goal for the following week, keeping their overall long term, end of the quarter goal in mind. The next question, much like the last question in the goal setting construction worksheet, intended to navigate participants to create an action plan which they dedicate a specified time during the week to engage in the fitness activities conducive to their goal attainment.

During the sixth class session, and for every other class session for the remainder of the intervention (ex. 8th, 10th, 12th...[the first class session of each week]), all study participants, including those in the control group were instructed to complete and return the physical activity log (Appendix E) by the start of the class session. However, it was only for those in the goal setting group that the experimenter facilitated a group discussion regarding the aspects of the goal evaluation process. Following the discussions, the participants in the treatment group submitted the goal evaluation worksheets (Appendix L) to the experimenter for feedback.

During the 7th class session and every week there after (ex. 9th, 11th, 13th...[the last class session of each week]) the experimenter handed back to the goal setting evaluation sheets with

appropriate written feedback. Comments generally included affirmations for following personally set goal setting action plans and further suggestions for goal attainment. Also during the start of these class sessions, the experimenter conducted brief class discussions regarding goal attainment strategies. Usual themes discussed were the various goal setting obstacles the participants came across, and the shared ideas for how to overcome them.

In addition, on the 7th class session, students were notified that they were requested to meet with the instructor individually at least once in the subsequent three weeks. This was done to ensure goal setting strategies are implemented effectively, and it also gave an opportunity to ask the experimenter any questions they may have regarding their fitness goals. Students were informed the meeting had to take place outside of class time and could either take place at a mutually agreed location or by telephone. The meeting entailed a more personal and verbal review of the most recently submitted goal setting evaluation sheet. The experimenter also encouraged participants to ask any questions they may have had regarding any portion of the goal setting process. At the end of the individual meeting, the experimenter informed each participant that they could request another personal conversation at a mutually agreed time and place at any point during the course of the experiment. All participants in the experimental group had opted to meet at a mutually set time located at the experimenter's office.

During the final day of classes, the Exercise Commitment Questionnaire, physical activity log, and the 12-minute run Cooper Fitness Test were re-administered and collected for data analysis.

In the instance where participants were absent during a class session when particular forms were to be completed and submitted, students were instructed to submit the particular form either electronically, or in the instructor's mailbox on campus. Similarly, when certain

participants were absent during the goal setting lecture or administration of the fitness test, students were told to meet with the instructor at a mutual time and location in order to attend the lecture or complete the fitness test.

Training program description. Despite varying weather conditions, participants in the control group were engaged in the same class activities as those in the intervention group with the exception of the goal setting program. The beginning jogging class in both the experimental and control group consists of an array of activities that related to jogging. Prior to the start of each exercise session, all participants engaged in some warm up for no more than 10 minutes consisting of a light aerobic activity followed by a stretching session. Physical activities that took place during class sessions consisted of but not limited to exercises such as jogging around various landmarks inside and outside the campus, interval training, and speed training. Brief presentations, lectures, and handouts were given regarding concepts of warming up, cooling down, running form, and the different kinds of aerobic workouts (ex. interval training, jogging to specified locations on and off campus, speed workouts and exercises, etc.). For more detail regarding daily class physical activities see appendix M.

Data analysis. As suggested by Vincent (2005), a series of 11 separate two-way between-within ANOVAs were calculated to determine whether there is a difference in the change in exercise commitment, exercise frequency, exercise duration, and fitness level over the course of the experiment, when comparing the goal setting group with the control group. To determine differences in exercise commitment components, every item (34) in the exercise commitment scale was averaged for each group. Each grouping of questions representing a component of the ECS was averaged for each condition (control vs. goal setting). Eight separate two-way between-within ANOVA analyses were then calculated (one for each component of the

ECS: want to commitment, have to commitment, satisfaction, social constraints, involvement alternatives, personal investments, social support and involvement opportunities) to examine group differences. Additionally, two more two-way between-within ANOVAs were calculated to determine group differences in the number of days and number of hours per week spent exercising. An additional two-way between-within ANOVA was computed to examine differences in fitness level among the two groups over time. For all statistical calculations made, a level of significance was set at $\alpha=.05$ and effect sizes were calculated to determine the magnitude of the treatment.

CHAPTER IV

RESULTS AND DISCUSSION

Results

The purpose of this study was to examine the effects of a goal setting program upon the exercise commitment and fitness levels of university students. Members of two separate physical activity beginning jogging courses participated in this study, one class (experimental group) underwent a goal setting program, while the other (control group) did not. The Exercise Commitment Scale (ECS) (Wilson et al., 2004), a self-reported physical activity log, and the 12-minute Cooper walk/run test (Cooper, 1968) was administered on the second and last day of class to determine whether goal setting had an effect on exercise commitment and fitness measures. Although all post-test measures were taken on the same day, pre-test measures for the goal setting group were taken one day prior that of their control group counterparts. A series of 11 separate two-way between-within ANOVAs were calculated to determine whether there was a significant difference between the two groups' measures over a time period of approximately 10 weeks.

Demographics. On the first day of class, participants were administered a demographics questionnaire (Appendix D) that asked for: the participant's gender, age, class standing, number of credits intending to enroll for that academic quarter, the average number of miles they run per week before attending the first day of class, and the typical number of hours per week employed at work. For reasons why certain individuals enrolled in the jogging class were excluded from data analysis, see appendix B. Group and total means for these variables are reported in Table 1. One participant's demographic data was missing and therefore was not included in demographic data, but the subject was included in all other statistical analyses.

The study population consisted of 50 students who were enrolled in two beginning jogging classes at Western Washington University. All participants were enrolled in undergraduate classes except for one participant in the goal setting program, who was a graduate student. The gender composition of each group consisted of 7 males and 17 females in the experimental goal setting group, and 11 males and 15 females in the control group.

Table 1

Demographic variables

Group	N	Male	Female	Age	Credits	Work	Run
Experimental	24	7	17	21.9	13.6	12.2	1.85
Control	26	11	15	21.1	14.2	7.5	4.46
All subjects	50	18	32	21.5	13.9	9.8	3.2

Note. Credits = reported number of credits intending to enroll in on day 1; Work = typical number of hours per working in current job; Run = typical number of miles ran per week.

ECS subscales. The first hypothesis of the current study stated that there would be no difference between the experimental and control groups measures on the eight different components of exercise commitment on the Exercise Commitment Scale (want to commitment, have to commitment, enjoyment/satisfaction, social constraints, social support, involvement alternatives, personal investment, and involvement opportunities) over time.

A total of eight subscales were derived from the 34 items in the ECS (Appendix A) consisting want to commitment (6 items), have to commitment (3 items), enjoyment (3 items), involvement alternatives (5 items), personal investments (4 items), social constraints (4 items), social support (3 items) and involvement opportunities (6 items). The items representing each subscale variable were averaged resulting in a score (based on the 10 point likert scale) that represents the participant's value for that particular variable. The average scores of each variable were again averaged among the participants in the treatment group, and then separately averaged among the scores of those in the control group. All questions administered were answered

except for one study participant in the control group who neglected to respond to one item on the want to commitment sub-scale during the pre-test. Therefore, the 5 items in the want to commitment subscale instead of the intended 6 were averaged for that study participant only. Means, standard deviations, and changes of means over time for each ECS subscale among both groups during the pre and post-test are shown on tables 2a through 2h.

Table 2a

Means and Standard Deviations for Want to Commitment Subscale

Group	N	Pre-Test		Post-Test		Change
		<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	
Experimental	24	7.28	1.58	7.54	1.56	.26
Control	26	7.43	2.09	7.53	1.91	.10

Table 2b

Means and Standard Deviations for Have to Commitment Subscale

Group	N	Pre-Test		Post-Test		Change
		<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	
Experimental	24	6.07	2.04	6.43	2.31	.36
Control	26	6.91	2.09	7.01	2.40	.10

Table 2c

Means and Standard Deviations for Enjoyment Subscale

Group	N	Pre-Test		Post-Test		Change
		<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	
Experimental	24	8.06	1.59	8.06	1.49	0.00
Control	26	8.18	1.81	8.53	1.41	.35

Table 2d

Means and Standard Deviations for Social Constraints Subscale

Group	N	Pre-Test		Post-Test		Change
		<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	
Experimental	24	3.55	2.04	4.03	2.49	.48
Control	26	4.79	2.27	4.13	2.13	-.66

Table 2e

Means and Standard Deviations for Involvement Alternatives Subscale

Group	N	Pre-Test		Post-Test		Change
		<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	
Experimental	24	5.84	1.44	6.71	1.3	.87
Control	26	5.32	2.05	5.81	1.82	.49

Table 2f

Means and Standard Deviations for Personal Investments Subscale

Group	N	Pre-Test		Post-Test		Change
		<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	
Experimental	24	5.38	2.05	6.52	2.0	1.14
Control	26	6.08	2.43	6.19	2.14	.11

Table 2g

Means and Standard Deviations for Social Support Subscale

Group	N	Pre-Test		Post-Test		Change
		<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	
Experimental	24	8.67	1.82	8.74	1.4	.07
Control	26	7.77	2.32	7.99	2.26	.22

Table 2h

Means and Standard Deviations for Involvement Opportunities Subscale

Group	N	Pre-Test		Post-Test		Change
		<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	
Experimental	24	7.85	1.59	7.94	1.9	.09
Control	26	8.26	1.12	8.06	1.58	-.20

Eight separate analysis of variance (ANOVA) tests were computed to determine if there was a significant difference between the goal setting and control group's 8 ECS subscale measures over a 10 week span. The data demonstrates that there were no statistically significant ($p \leq .05$) differences between the goal setting and control group's ECS variables over time. However, the results do indicate that the ECS variables involvement alternatives ($F=4.43$; $p=.04$) and social support ($F=4.21$; $p=.04$) yielded statistically significant differences between the goal setting and control group regardless of time. F-scores for the ANOVA tests are reported on Table 3a.

Furthermore, the effect size was calculated to determine the magnitude goal setting effects had over time on each of the 8 ECS subscales; effect sizes are shown on Table 3b. According to Vincent (2005) those with a ω^2 value between .01 and .06 are deemed to have a small effect size. Therefore, based on this standard, there were small effect sizes for the social constraints ($\omega^2=.017$) and personal investments ($\omega^2=.014$) subscales between the two groups over time. Furthermore, there were small effects between goal setting and control group regardless of time among the have to commitment ($\omega^2=.026$), involvement alternative ($\omega^2=.044$) and social support ($\omega^2=.042$) subscales.

Table 3a

F-Scores--ECS Subscales

	Want to	Have to	Enjoy	Const	Altern	Invest	Support	Opport
Group*Time	.048	.09	.30	1.65	.31	1.41	.03	.22
Group	.04	2.58	.88	2.23	4.43*	.19	4.21*	.68
Time	.26	.27	.30	.04	4.02*	2.11	.13	.03

Note. Want to = Want to commitment; Have to = Have to commitment; Enjoy = Enjoyment; Const = Social Constraints; Altern = Involvement Alternatives; Invest = Personal Investments; Support = Social Support; Opport = Involvement Opportunities. *Statistically Significant $p \leq .05$.

Table 3b

Effect Size, Calculated by ω^2 --ECS Subscales

	Want to	Have to	Enjoy	Const	Altern	Invest	Support	Opport
Group*Time	.001	.001	.003	.017*	.003	.014*	.000	.002
Group	.000	.026*	.009	.023*	.044*	.002	.042*	.007
Time	.003	.003	.003	.000	.04*	.022*	.001	.000

Note. Want to = Want to commitment; Have to = Have to commitment; Enjoy = Enjoyment; Const = Social Constraints; Altern = Involvement Alternatives; Invest = Personal Investments; Support = Social Support; Opport = Involvement Opportunities. *Small effect $.01 \leq \omega^2 \leq .06$.

Exercise commitment behaviors. The second hypothesis of this current study stated that there would be no difference in the exercise commitment behaviors (exercise frequency and exercise duration) between the experimental goal setting and the control group over time. Exercise commitment behaviors were measured based on self-reported physical activity for the seven days previous to the pre and post-test dates.

Exercise participants reported all types of leisurely moderate to vigorous aerobic physical activity that they engaged in for at least 30 minutes per exercise session during the previous seven days of reporting. The number of exercise sessions of aerobic activity reported for that week was utilized as the participant's exercise frequency measure. In addition, the accumulative number of minutes per week reported engaging in aerobic activity was used as the participant's

exercise duration measure. The means, standard deviations, and changes of means over time for commitment behavior measures in both groups are shown in tables 4a and 4b.

Table 4a

Means and Standard Deviations for Exercise Frequency

Group	N	Pre-Test		Post-Test		Change
		<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	
Experimental	24	2.54	1.53	3.71	1.27	1.17
Control	26	2.88	1.70	3.04	1.15	.16

Table 4b

Means and Standard Deviations for Exercise Duration

Group	N	Pre-Test		Post-Test		Change
		<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	
Experimental	24	131.50	113.83	149.63	71.07	18.13
Control	26	150.62	169.83	116.35	68.61	-34.27

Two separate analysis of variance (ANOVA) tests were computed to determine if there was a significant difference between the goal setting and control group's exercise frequency or duration over a 10 week span. The data shows that there were not any statistically significant ($p \leq .05$) differences between the goal setting and control group's exercise commitment behaviors over time. However, the data revealed that regardless of which groups they were allocated to, the study participants reported statistically significant measures of exercise frequency measures over time ($F=5.32$; $p=.02$). F-scores for the ANOVA tests can be shown on Table 3c. Effect sizes were also calculated to determine the magnitude goal setting effects had over time on exercise frequency as well as duration; these effect sizes are reported on Table 3d. There was a

small effect in the amount of bouts per week spent exercising aerobically between the two groups over time ($\omega^2=.032$).

Table 5a

F-scores--Exercise Commitment Behaviors

	Exercise Frequency	Exercise Duration
Group*Time	3.13	1.31
Group	.33	.10
Time	5.32*	.13

Note. *Statistically Significant $p \leq .05$

Table 5b

Effect Size, Calculated by ω^2 --Exercise Commitment Behaviors

	Exercise Frequency	Exercise Duration
Group*Time	.032*	.013*
Group	.003	.001
Time	.052*	.001

Note. *Small effect $.01 \leq \omega^2 \leq .06$.

Fitness level. Lastly, the third hypothesis of this study stated that there would not be a difference in the performance of the Cooper 12 minute walk/run aerobic fitness test between the experimental goal setting and control group over time. Fitness level was measured based on the each participant's performance in the 12-minute Cooper walk/run fitness test. The number of meters completed after 12 minutes (rounded to the nearest 100 meters) was reported by the participants immediately after completion of the test. The means, standard deviations, and changes of means over time for the fitness test measures among the control and goal setting during the pre and post-test are presented in table 6.

Table 6

Means and Standard Deviations for the 12-Minute Cooper Walk/Run Fitness Test

Group	N	Pre-Test		Post-Test		Change
		<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	
Experimental	24	1927.19	367.33	2220.22	371.21	293.03
Control	26	2164.57	468.21	2170.13	456.41	5.56

A separate analysis of variance (ANOVA) test was computed to determine if there was a significant difference between the goal setting and control group's aerobic fitness levels over a ten week period. The data demonstrates that there were neither any statistically significant ($p \leq .05$) group differences nor differences in fitness levels over time. F-scores for the fitness level ANOVA tests are shown in Table 7a. Furthermore, the effect size was computed to determine the magnitude goal setting effects had over time on aerobic fitness level; these effect sizes are reported in Table 7b. Results indicated that there were less than small effects in the aerobic fitness level between the two groups and over time.

Table 7a

F-Score--12-Minute Cooper Walk/Run Fitness Test

Cooper Fitness Test	
Group*Time	2.92
Group	1.24
Time	3.15

Note. *Statistically Significant $p \leq .05$

Table 7b

Effect Size, Calculated by ω^2 --12-Minute Cooper Walk/Run Fitness Test

Cooper Fitness Test	
Group*Time	.030*
Group	.013*
Time	.032*

Note. *Small effect $.01 \leq \omega^2 \leq .06$.

Discussion

ECS subscales. Though the goal setting group reported slightly higher increases in majority of the ECS measures over time (want to commitment, have to commitment, social constraints, involvement alternatives, personal investments, and involvement opportunities), none of the ECS measures were statistically significant between the two groups over time. This provides evidence to suggest that there are no significant differences among any ECS subscale measures between the goal setting and control group over the 10 week period. There were however, statistically significant group differences regardless of time among measures of involvement alternatives ($f=4.43$; $p=.038$) and social support ($f=4.21$; $p=.043$). The effect size of $\omega^2=.017$ for the social constraint and $\omega^2=.014$ for the personal investment measure indicate that there was a small effect on these variables over time due to the treatment (Vincent, 2005). In addition small effects were found in measures of involvement alternatives ($\omega^2=.044$) and social support ($\omega^2=.042$) between the groups notwithstanding time.

Results from this current study seem to conflict with past related goal setting studies that tested certain aspects of the ECS. In the current study, no statistically significant group differences were reported over time in any of the ECS subscales in contrast to past similar goal setting studies that reported certain statistically significant findings (Sousa, Smith, & Cruz, 2008; Stein & Scanlan, 1992; Wilson & Brookfield, 2009). For instance, Stein and Scanlan study

suggested that athletes who set various process and outcome goals had a higher tendency to experience higher levels of enjoyment pertaining to their sport (Stein & Scanlan, 1992).

Another study suggested that when coaches engage in goal setting, not only do they increase their desired coaching behaviors, but they also influence their athletes' reported level of commitment and enjoyment to their respective sport (Sousa et al., 2008). Similarly, an exercise goal setting related study conducted by Wilson and Brookfield (2009) suggested that those who create exercise related goals are more like to report higher interest in engaging in exercise compared to those who do not.

Exercise commitment behaviors. Similar to the results of the ECS subscales, the goal setting group reported higher increases in both exercise frequency and duration over the course of the study, yet none of these measures produced statistically significant results. This provides evidence to suggest that there were no significant differences among exercise commitment behavioral measures between the goal setting and control group over the 10 week period. However, there were statistically significant differences in exercise frequency between pre-test and post-test measures ($f=5.32$; $p=.023$) regardless of which group participants were assigned to. This can be attributed to the fact that one week prior to the pre-test, study participants were not obligated to exercise because the jogging class had not yet commenced whereas one week prior to the post-test, students were obliged to participate in the physical activity course (beginning jogging) in order to fulfill requirements of receiving full credit for the class. Furthermore, the effect size of exercise frequency ($\omega^2=.032$) and exercise duration ($\omega^2=.013$) suggests that the goal setting intervention had a small effect on both exercise commitment behavior values.

However, it may be worthy to note that despite the lack of statistical significant differences between the two groups, the goal setting group did increase the number of bouts of

exercise per week by one day whereas the increases in the control group were quite miniscule in comparison. Additionally, it is also worthy to note that exercise duration average among the goal setting group increased by nearly 20 minutes per week, whereas their control group counterparts decreased their exercise duration by more than 30 minutes by the end of the goal setting implementation. Such findings suggest practical significance since the overall objective of the goal setting program was to increase one's time spent engaging in aerobic physical activity.

Statistical findings in the current study seem to contrast with other studies investigating the relationship between goal setting and exercise behaviors (Annesi, 2002; Poag-DuCharme & Brawley, 1994; Wilson & Brookfield, 2009). More specifically, those who set exercise related goals are more likely to adhere to their exercise program or regimen (Annesi, 2002; Wilson & Brookfield, 2009) and report higher levels of intensity in their workouts (Poag-DuCharme & Brawley, 1994) compared to those who do not engage in some form of goal setting program. In contrast, other studies have also revealed the lack of significant influence setting fitness goals may have on exercise frequency and duration (Cobb, Stone, Anonsen, & Klein, 2000; Poag-DuCharme & Brawley, 1994). Cobb and colleagues (2000) propose that goals are not the only components that lead to exercise inducing action and do not guarantee strong commitment to exercise; instead, the relationship between goal setting and behavior is one that is influenced by other numerous variables.

Fitness level. Similar to the results of exercise commitment variables, the goal setting group recorded higher increases in the Cooper 12 minute walk/run fitness test even though the difference in fitness levels were not statistically significant. This indicates that there are no significant differences in the aerobic fitness level between the goal setting and control group over

time. Furthermore, the Cooper 12 minute walk/run effect size ($\omega^2=.030$) revealed that the goal setting intervention did indeed have a small effect on aerobic fitness level (Vincent, 2005).

However, despite the lack of statistical significance, the data had produced some practically significant findings. As Table 6 shows, the goal setting group increased their performance by nearly 300 meters or $\frac{3}{4}$ lap, whereas the control group exhibited a miniscule 5.5 meter increase over a 10 week period. Such increased averages displayed by the experimental group raises the average group fitness level by one fitness zone according to the 12 minute walk/run Cooper test norms (Corbin, Lindsey, & Welk, 2000), whereas the control group remained in the same fitness zone category. These findings can also be deemed as practically significant considering that the control group, prior to the intervention, reported to run more than twice the miles per week in comparison to their goal setting counterparts (Table 1), yet the goal setting group outperformed the control group in the fitness test by the end of the course.

It may also be worthy to note that the moderate variance regarding the fitness tests among both groups. The standard deviation for the experimental group's pre and post test measures were 367.33 and 371.21 respectively. Comparatively, the standard deviations of the control group's fitness performances were larger: 468.21 for the pre test and 456.41 for the post test.

Instructor evaluation. Towards the end of the academic quarter, all participants anonymously filled out and submitted an evaluation rating for the overall effectiveness of the instructor. Those in the experimental group generally reacted positively towards the goal setting program in the instructor evaluation. When asked on the evaluation form 'what aspects of the teaching or content do you feel were especially good,' one participant commented "the instructor's attention to detail and student's progress was excellent and super helpful." Another student remarked "made sure to evaluate each person individually and each week helped us to

work towards a goal.” These comments as well as other “I thought the lessons about goal setting were good” remarks provide support for the notion that goal setting can have an effect on one’s exercise commitment and fitness level.

Summary

Two separate physical activity courses (beginning jogging) were allocated to into two experimental groups: one class engaged in a fitness goal setting program while the other did not. Components of exercise commitment and aerobic fitness level were measured before and after the onset of the goal setting intervention. Though results had not produced any statistically significant differences in exercise commitment or fitness level over a 10 week period, there was evidence to suggest that the goal setting implementation had small effects on a) certain determinants of exercise commitment, b) exercise frequency and c) fitness level. Results had produced partial support for all 3 hypotheses posited in the study, even though findings were statistically insignificant. Findings in the current study have both complimented and contrasted past studies in the sport and exercise psychology literature aimed to examine the effects goal setting has on commitment and other behaviors in a physical activity setting.

Chapter V

Summary, Conclusions, and Recommendations

Summary

The purpose of the current study was to examine the effects of a goal setting program had on exercise commitment and aerobic fitness among university students. More specifically, the purpose of this study was to examine the effects a goal setting program exercise commitment (Wilson et al., 2004), and aerobic fitness (Cooper, 1968).

Obesity continues to be a problematic and increasing epidemic in the United States and has been the source of many unhealthy outcomes such as cardiovascular diseases, diabetes, and certain types of cancer (Centers for Disease Control [CDC], 2009). Though there are many physical and mental benefits to engaging in physical activity (Farrell & Thompson, 1998; Finkenber, DiNucci, McCune, & McCune, 1994), individuals' discontinue to participate in physical activity for a variety of reasons (Anderson, 2003; Kamarudin & Omar-Fauzee, 2007). Many psychology and exercise psychology experts and theorists have attempted to explain concepts regarding sport and exercise commitment (Ajzen & Madden, 1986; Bandura, 1977; Scanlan, Carpenter, Schmidt, Simons, & Keeler, 1993; Wilson et al., 2004). Some theorists have utilized goal setting as an intervention to increase commitment effectiveness of exercise participants (Annesi, 2002; Sousa, Smith, & Cruz, 2008; Stein & Scanlan, 1992; Wilson & Brookfield, 2009).

A two-way between-within experimental design was used in this study involving two separate physical education activity classes to determine the effects a goal setting program had on exercise commitment and fitness level. Two physical education activity classes were separated into an experimental group and a control group. Participants in the experimental group

adhered to a goal setting program entailing educational, constructive, and evaluative components aimed to pursue self-selected aerobic fitness goal while the control group did not. Prior to the onset of the goal setting implementation (pre-test) and at the final day of classes (post-test), measurements of: a) exercise commitment as measured by the Exercise Commitment Scale (Wilson et al., 2004); b) exercise behaviors as indicated by the frequency and duration of exercise (days and hours per week spent on exercising); and c) aerobic fitness as measured by the Cooper 12 minute walk/run test (Cooper, 1968) were taken. Analyses of variance (ANOVAs) and effect sizes (Vincent, 2005) were calculated to determine statistical significance regarding the effects the goal setting program on exercise commitment and fitness level over the 10 week period of the course.

Conclusions

Upon computing 11 separate two-way between-within ANOVAs, none of the dependent variables produced any statistically findings among the experimental and control group over time. However, there were group differences (regardless of time) among the dependent variables involvement alternatives and social support. Additionally, upon calculating effect sizes, the results suggest that the goal setting program, over the length of the experiment, had a small effect on social constraints, personal investments, exercise frequency, exercise duration, and the results of the Cooper 12 minute walk/run fitness test.

Although not statistically significant, the results of this study revealed several practical trends related to exercise commitment and physical activity. First, the goal setting group increased the weekly frequency of their physical activity from roughly two and a half days per week to more than three and a half days by the end of the experiment as compared to the relatively minor physical activity increases of the control group. Furthermore, the goal setting

experimental group increased their weekly exercise duration time by 18 minutes while the control group on average decreased theirs by nearly 35 minutes; a difference of over 50 minutes per week for engaging in aerobic physical activity per week.

Another practically significant finding may be observed within the Cooper 12 minute walk/run fitness level data in which the goal setting group outperformed their control group counterparts. More specifically, the experimental goal setting group increased their performance on average by nearly 300 meters (3/4 of a lap) from pre to post-test while their control group counterparts increased their performance to 5.6 meters. This level of improvement increased the goal setting group's performance by one fitness zone according to Cooper test norms (Corbin, Lindsey, & Welk, 2000). Such findings can be deemed particularly important considering that those in the control group reported to run nearly 2.5 times more miles per week compared to those in the goal setting group at the beginning of the experiment.

Lastly, it also might be worthy to note that the goal setting group yielded higher increased averages over time in six out of the eight variables on the Exercise Commitment Scale (ECS)- want to commitment, have to commitment, social constraints, involvement alternatives, personal investments, and involvement alternatives.

Recommendations

Due to certain limitations of the study, there are several recommendations that could be made for future research related to the concepts of goal setting, commitment, and fitness level. Firstly, the demographics of the study participants consisted mostly of university aged students who resided in the northwestern part of Washington state. Having an age specific sample residing in a specific region in the United States may not necessarily externally validate an entire population of those who desire to increase their exercise behaviors and fitness levels. To

increase the external validity of the current study, similar studies utilizing older/younger populations. Similar studies utilizing domestic or international populations who lead different lifestyles and experience diverse environmental conditions would be appropriate. The second limitation of the study included exercise commitment and fitness measurements that were taken only twice during the two and a half months the experiment took place. Increasing the number of measurements taken during the experiment may increase the reliability of each participant's true measures. Particularly with the commitment behavior measures, additional metrics could have been useful for data analysis considering any given week of physical activity could have been unusual for the participant. For instance, certain participants reported to engage in aerobic physical activity prior to the pre and post-tests that they do not frequently engage in such as snowboarding, dancing at an on-campus event, and waterskiing. Since these activities are seasonal and intermittent in nature, including supplemental points during the study where commitment behavior could have been taken may also be useful for increasing the reliability of the participants' exercise behavior measures.

Comparably, the fitness level component of the study could have been administered multiple times. It may be noteworthy that the researcher noticed certain students on the fitness level post-test ran much slower than they had exhibited throughout the course of the class. When the researcher later questioned the students about their performance, some said they had been exhausted from studying for finals (the post-test took place on the first day of finals week). One other participant claimed he had suffered bursitis on his shoulder. Therefore, more than two administrations, or perhaps even supplementing the Cooper 12 minute walk/run test as more measures of fitness level may have increased the reliability of each participant's true aerobic fitness capacity.

Similarly, demographic variables namely the number credits enrolled, hours of work employed, and the average number of miles run in one week were taken only on the first day of classes. It may have been valuable to detect any differences in these variables for the post-test measures to examine any possible behavioral or other external factors that could potentially affect exercise behaviors.

Since the study examined immediate effects of the goal setting program, exercise and physical fitness, maintenance was not inspected. Prochaska and DiClemente (1983) claimed that the final stage of behavior change is maintaining that particular behavior for an extended period of time. A more longitudinal study design where similar exercise commitment and aerobic measurements were taken several months (or even years) after the cessation of the goal setting program would be interesting to observe the more long term effects of goal setting.

Another limitation of the current study is how the two physical activity beginning jogging classes took place on two separate days (except for the final class) in the same quarter of academic year. Not only did the two classes take place under different weather conditions, but also the goal setting group gained two extra classes due to the Veteran's and Thanksgiving day holidays where the control group did not convene. Future research utilizing a similar study design may want to consider utilizing observing two classes that take place on the same day. Another consideration may be to include more than two physical activity beginning jogging classes in addition to more classes throughout the academic year. This would increase the sample size and power of the study while simultaneously controlling for varied environmental conditions or scheduling conflicts.

An additional recommendation that can be prescribed is the incorporation of an exercise intensity metric. Since past exercise commitment related research have aimed to link exercise

intensity as a behavioral outcome of exercise commitment (Gabriele, Walker, Gill, Harber, & Fisher, 2005; Wilson et al., 2004), it may be pertinent to employ some sort of quantitative measure for exercise intensity to be included in data analysis. Such a method would add potency to the overall exercise behavior findings.

One limitation to the current study was the lack of control for demographic variables. In this current study, the experimental group's male to gender ratio (7 males; 17 females) was considerably smaller than that of the control group's (11 males; 15 females). Also demographically contrasted before the onset of the experiment, the control group reported twice the amount of average weekly miles ran compared their experimental counterparts (1.85 miles compared to 4.46 miles). Similar studies in the future may want to consider pairing up experimental and control groups with more similar and comparable demographic measures.

A final suggestion for potential future research is to improve the manner in which the goal setting program was implemented. In hopes of achieving convenience for the participants, the researcher attempted to develop forms to be filled out electronically and online as an option for submission. However, there were many instances where technical difficulties, formatting problems, and other software issues took place that prevented students from submitting certain forms electronically. Even though most students submitted the proper forms in person in a relatively timely manner, a more flawless and convenient approach for submission of such forms should be considered for future implementations.

These recommendations are provided in hopes that future research and practical methods regarding goal setting, exercise commitment, and fitness level can be improved upon. Doing so may increase the understanding of how the use goal setting impacts one's commitment level and performance in areas related or unrelated to physical activity.

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Appendix A

Exercise Commitment Scale (ECS)

Exercise Commitment Scale (ECS):
(Taken from Wilson et al., 2004: The Exercise Commitment Scale)

NAME:

DATE:

DIRECTIONS: Please read the questions carefully and circle the response that best describes how you usually feel about exercise.

1) All things considered, exercise is very satisfying

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

2) Because I exercise, I feel satisfied

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

3) I find exercising to be very rewarding

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

4) People will think I am a quitter if I stop exercising

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

5) I feel pressure from other people to exercise

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

6) I have to keep exercising to please others

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

7) People will be disappointed with me if I quit exercising

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

8) I have invested a lot of effort into exercising

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

9) I have invested a lot of energy into exercising

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

10) I have invested a lot of time into exercising

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

11) I have invested a lot of my own money into exercising

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

12) Compared to exercising, there are other things I could do which would be more fun

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

13) Compared to exercising, there are other things I could do which would be more enjoyable

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

14) Compared to exercising, there are other things I could do which would be more worthwhile

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

15) I would be happier doing something else instead of exercising

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

16) I would like to do something else instead of exercising

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

17) People important to me support my exercising

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

18) People important to me think it is okay to exercise

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

19) People important to me encourage me to exercise

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

20) Exercising gives me the opportunity to do something exciting

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

21) Exercising gives me the opportunity to relieve any stress I am feeling

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

22) Exercising gives me the opportunity to have a good time.

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

23) Exercising gives me the opportunity to be with my friends

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

24) Exercising gives me the opportunity to improve my health and fitness

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

25) Exercising gives me the opportunity to improve my physical skills

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

26) I am determined to keep exercising

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

27) I am dedicated to keep exercising

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

28) I am committed to keep exercising

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

29) I am willing to do almost anything to keep exercising

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

30) I want to keep exercising

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

31) It would be hard for me to quit exercising

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

32) I feel obligated to continue exercising

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

33) I feel it is necessary for me to continue exercising

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

34) I feel exercise is a duty

1	2	3	4	5	6	7	8	9	10
Not at all true for me							Completely true for me		

Appendix B

Reasons for Omission in Data Analysis

Reasons for Omission in Data Analysis

1. Refusal to participate in study. [0]
2. Did not obtain any pre or post test measures (ECS, physical activity log, & cooper test) during 2nd or 10th week. [13]
3. Ran multiple marathons, or was/is a collegiate cross country or track athlete. [1]*
4. Did not attend more than 3 class sessions. [13]
5. Did not attend any goal setting lectures (treatment group only). [0]
6. Did not ever submit goal setting construction or time management sheet (treatment group only). [0]
7. Did not ever submit 3 or more goal setting evaluation sheets (treatment group only). [0]
8. Did not ever meet with instructor personally to discuss progress of fitness goals (treatment group only). [0]
9. Those who scored more than 2.5 standard deviations above the class average during the 12 minute Cooper walk/run fitness pretest during the second class session. [0]

*Participant excluded from data analysis due to marathon involvement was in the control group.

TOTAL OMITTED FROM EXPERIMENTAL GROUP: 8

TOTAL OMITTED FROM CONTROL GROUP: 7

Appendix C
Informed Consent Form

CONSENT FORM

Purpose and Benefit:

Researchers have been interested in the possible effects goal setting has on exercise commitment. The purpose of this study is to examine the effects goal setting has on exercise commitment and fitness levels among university students. The results of this study will enrich our understanding of how goal setting may affect one's fitness level and level of commitment to exercise.

I UNDERSTAND THAT:

- 1) Participation is voluntary and you are free to withdraw your consent and to discontinue participation without penalty or loss of class credits or impacting the class grade which the participant is otherwise entitled.
- 2) The current study involves a completion of filling out a series of questions that include my perceptions of my own exercise commitment levels and the frequency of my exercising habits. My participation in filling out the questionnaires will take approximately 5-10 minutes. The current study also involves my participation in a 12-minute run during the second and tenth week of the academic quarter that I will perform to the best of my ability.
- 3) Participation in the current study may require attending mandatory lectures, meeting with the instructor, and completion and submission of class assignments.
- 4) The only physical risks associated with this study are those that might come about when running on a track for 12 continuous minutes.
- 5) Benefits may come about from participating in this study. First, it might give me a chance reflect back on exercise behaviors and assess what sorts of factors are added or detracted from my commitment to exercise. Possible adjustments can then be made in order to increase my level of commitment for possible future exercising or other performing experiences. Another possible benefit that may be received from participation of this study may be to obtain a greater comprehension of the research process for general psychological or any exercise-related studies.
- 6) All information obtained is confidential. My signed consent form will be stored in a locked office. Only the primary researcher will view my personal responses to the questions in the survey. Fellow classmates will not have access to any of my responses at any time. The questionnaire that I filled out will be shredded at the end of the study.
- 7) In any publications of this study, all individual performances and responses to the questionnaire will be reported anonymously.
- 8) My signature on this form does not waive my legal rights of protection.
- 9) In participating I understand I must not discuss the details of the course content until after the completion of the experiment.

10) This experiment is administered by Mr. Rahmin Buckman. Any questions that I have about the study or your participation may be directed to him at (619) 203-2221.

If you have any questions or comments regarding your participation in this study or your rights as a research participant, you may contact the WWU Human Protections Administrator (HPA) Janai Symons, (360) 650-3220. If during or following participation of this study you suffer from any adverse effects as a result of involvement in the study, please notify the researcher conducting the study or the WWU Human Protections Administrator.

.....

I have read the above description and agree to participate in the study. I am at least 18 years of age.

Participant's signature

Date

Participant's PRINTED NAME

Appendix D
Demographics Questionnaire

Demographics Questionnaire

Name:

Age:

Gender:

Male Female

Class Standing:

Freshman Sophomore Junior Senior Graduate

Other (Please Specify) _____

How many credits do you intend on enrolling in this quarter? _____

Employment:

Are you currently employed? Yes/No (please circle)

If so, on average how many hours per week do you work at your current job? ____

Running Experience:

On average how many number of miles per week do you run? ____

Please check the box that best describes your highest competitive experiences related to running.

Collegiate (track or X country) Collegiate (other) High school

Multiple competitive runs in one year One competitive run in one year

Typical race length (if applicable): 5k 10k Half marathon Full marathon

None Other: _____

Appendix E
Physical Activity Log Sheet

Physical Activity Log

NAME:

DATE:

Directions:

- 1) List all exercise-related activities that you engaged in during the last week for at least 30 minutes.
- 2) Add up all minutes from activities on that day
- 3) Refer to intensity chart to determine the intensity of your activities for the day.

DAY	Activities	Duration (MIN)	Intensity (Circle one)
MON			Moderate / vigorous
TUES			Moderate / vigorous
WED			Moderate / vigorous
THU			Moderate / vigorous
FRI			Moderate / vigorous
SAT			Moderate / vigorous
SUN			Moderate / vigorous

How can I tell an activity at a moderate level from a vigorous one?

(Taken from the United States Department of Health and Human Services, 2008)

Vigorous activities take more effort than moderate ones. Here are just a few moderate and vigorous physical activities.

Moderate Activities (I can talk while I do them, but I can't sing)	Vigorous Activities (I can only say a few words without stopping to catch my breath)
<ul style="list-style-type: none"> • Ballroom and line dancing • Biking on level ground or with few hills • Canoeing • General gardening (raking, trimming shrubs) • Sports where you catch and throw (baseball, softball, volleyball) • Tennis (doubles) • Using your manual wheelchair • Using hand cyclers—also called ergometers • Walking briskly • Water aerobics 	<ul style="list-style-type: none"> • Aerobic dance • Biking faster than 10 miles per hour • Fast dancing • Heavy gardening (digging, hoeing) • Hiking uphill • Jumping rope • Martial arts (such as karate) • Race walking, jogging, or running • Sports with a lot of running (basketball, hockey, soccer) • Swimming fast or swimming laps • Tennis (singles)

Appendix F

Cooper 12 Minute Walk/Run Fitness Test Norms

Cooper 12 Minute Walk/ Run Fitness Test Rating Chart
(Corbin, Lindsey, & Welk, 2000)

Scores are in miles

Mens

<i>Classification</i>	<i>Age</i>			
	17-26	27-39	40-49	50+
High-performance zone	1.80+	1.6+	1.5+	1.4+
Good fitness zone	1.55-1.79	1.45-1.59	1.40-1.49	1.25-1.39
Marginal zone	1.35-1.54	1.30-1.44	1.25-1.39	1.10-1.24
Low Zone	<1.35	<1.30	<1.25	<1.10

Womens

<i>Classification</i>	<i>Age</i>			
	17-26	27-39	40-49	50+
High-performance zone	1.45+	1.35+	1.25+	1.15+
Good fitness zone	1.25-1.44	1.20-1.34	1.15-1.24	1.05-1.14
Marginal zone	1.15-1.24	1.05-1.19	1.0-1.14	.95-1.04
Low Zone	<1.15	<1.05	<1.00	<.94

4 LAPS = 1 MILE

1 LAP = 0.25 MILE

¾ LAP = 0.19 MILE

½ LAP = 0.13 MILE

¼ LAP = 0.06 MILE

Appendix G

Overview of Measurement Techniques, Procedures, and Schedule

OVERVIEW OF THE MEASUREMENT TECHNIQUES, PROCEDURES, AND SCHEDULE

Class 1 (Control and Treatment)	ADMNISTER: <ul style="list-style-type: none"> • Informed consent (Appendix C) • Demographics (Appendix D)
Class 2 (Control and Treatment)	ADMINISTER: <ul style="list-style-type: none"> • Exercise Commitment Scale (Appendix A) • Physical Activity Log (Appendix E) • Cooper 12 min walk-run test (Appendix F)
Class 3 (one class lecture period) (Treatment only)	REVIEW/LECTURE <ul style="list-style-type: none"> • ACSM exercise guidelines (Appendix H) • Time management (Appendix I) • Goal setting handouts and lecture (Appendix J) • Construction of individual goal setting plan (Appendix K)
Class 4 (Treatment only)	SUBMIT: <ul style="list-style-type: none"> • Time Management Worksheet (Appendix I) • Goal Setting Construction worksheet (Appendix K)
Class 5 (Treatment only)	RETURN WITH WRITTEN FEEDBACK: <ul style="list-style-type: none"> • Goal Setting Construction Worksheet (Appendix K) • Time Management worksheet (Appendix I) REVIEW/LECTURE: <ul style="list-style-type: none"> • Goal Setting Evaluation Worksheet (Appendix L)
Classes 6, 8, 10, 12, 14, 16, 18 (Treatment only)	<ul style="list-style-type: none"> • Group and class discussion regarding the progress of self set fitness goals. • Submit Goal Setting Evaluation (Appendix L)
Classes 6, 8, 10, 12, 14, 16, 18 (Control & Treatment)	SUBMIT: <ul style="list-style-type: none"> • Physical Activity log Sheet (Appendix E)
Classes 7, 9, 11, 13, 15, 17, 19 (Treatment only)	<ul style="list-style-type: none"> • Goal setting evaluation worksheet (Appendix L) returned to participants w/instructor's written feedback
Classes 7-14 (Treatment only)	<ul style="list-style-type: none"> • Participants meet individually with instructor at a mutual time and location or by telephone to discuss personal goals

Class 20 (Control and Treatment)	ADMINISTER: <ul style="list-style-type: none">• Exercise Commitment Scale (Appendix A)• Physical Activity Log Sheet (Appendix E)• Cooper 12 min walk-run (Appendix F)
-------------------------------------	--

Appendix H

American College of Sports Medicine (ACSM) Guidelines

American College of Sports Medicine (ACSM)
Exercise Guidelines (Haskell et al., 2007)

***Engage in moderate intensity aerobic (endurance) physical activity for at least 30 minutes, 5 times each week

or

***Engage in vigorous intensity aerobic (endurance) physical activity for at least 20 minutes, 3 times each week

or

***Engage in vigorous intensity aerobic (endurance) physical activity for at least 20 minutes, twice a week **AND** engage in moderate intensity aerobic physical activity for at 30 minutes twice during the same week.

How can I tell an activity at a moderate level from a vigorous one?

(Taken from the United States Department of Health and Human Services, 2008)

Vigorous activities take more effort than moderate ones. Here are just a few moderate and vigorous physical activities.

Moderate Activities (I can talk while I do them, but I can't sing)	Vigorous Activities (I can only say a few words without stopping to catch my breath)
<ul style="list-style-type: none"> • Ballroom and line dancing • Biking on level ground or with few hills • Canoeing • General gardening (raking, trimming shrubs) • Sports where you catch and throw (baseball, softball, volleyball) • Tennis (doubles) • Using your manual wheelchair • Using hand cyclers—also called ergometers • Walking briskly • Water aerobics 	<ul style="list-style-type: none"> • Aerobic dance • Biking faster than 10 miles per hour • Fast dancing • Heavy gardening (digging, hoeing) • Hiking uphill • Jumping rope • Martial arts (such as karate) • Race walking, jogging, or running • Sports with a lot of running (basketball, hockey, soccer) • Swimming fast or swimming laps • Tennis (singles)

Appendix I
Time Management Form

Time Management Form Guidelines/Script
(Vernacchia, 2003)

1. Make a list of all typical activities you wish to accomplish throughout the days of the week (ex. Studying, working out, attending class, friends and family, etc.).
2. Prioritize these activities in preferential order.
3. Block these activities in preferential order on your time management worksheet (ex. if school is your first priority, block school related activities before all other activities).
4. Visualize yourself successfully accomplishing these activities.
5. Review your time management worksheet throughout the days of the week.
6. Check off those activities after you have successfully performed them.
7. Begin the process over again the next day by giving priority to those activities that did not get accomplished previously.

TIME MANAGEMENT WORKSHEET

	MON	TUE	WED	THU	FRI	SAT	SUN
6AM							
7AM							
8AM							
9AM							
10AM							
11AM							
12PM							
1PM							
2PM							
3PM							
4PM							
5PM							
6PM							
7PM							
8PM							
9PM							
10PM							

Appendix J

Goal Setting Lecture Handout

Goal Setting Handout Lecture Guide

Goal definition

- A level of performance one wishes to attain within a specified time frame.

Types of goals:

- Outcome Goal
 - Based on comparing oneself to others.
 - Typically measured based on one's win/loss record or ranking.
 - Ex. winning, rankings, scoreboard, etc.
- Performance Goal
 - Based on one's past performances
 - Usually measured based on personal measurements.
 - Ex. mile time, weight, number of sit-ups per minute, etc.
- Process Goal
 - Based on a specific behavior, technique, or strategy.
 - Generally measured in frequencies of aimed habit
 - Ex. motoric technique, # of exercise sessions/week, diet, etc.

Purpose of Goals:

- Focus
 - Provides specifics on how to achieve what you want
 - Makes an action plan clearer
 - Makes it easier to track progress and make necessary adjustments
- Motivation
 - Targets one's effort to what is needed
- Accountability
 - Takes ownership
 - Limits external excuses

Goal setting strategies:

- Specific
 - Specifically what would you like to accomplish
 - How would you know you accomplished this?
- Measurable
 - Tracks progress
 - Provides some information for possible adjustments
 - Tells you when you have achieved the goal
- Achievement Strategies
 - A live action script to accomplish your goal
 - Provides steps on how to accomplish your goal
- Realistically Challenging
 - Continually pushing yourself to improve
 - Too hard or too easy → more likely to give up
 - Too easy → give up after easily
- Time Bound
 - Setting shorter term goals
 - Provides periodic checkpoints of short term progress
- Exhibit

- How will you chart or post your progress and measurable weekly goals?
- Visual aids help (posters, pictures, quotes, etc.)
- Seek Support
 - The more people involved in your fitness goals, the more dedicated you get
 - Ex. Workout buddy, teammate, friend, family etc.
- Target Obstacles
 - Anticipating challenges and preparing to overcome them
 - Expect the unexpected, have a plan that tackles potential setbacks.



Setting Goals

What is a goal?



* **Goal** = a level of performance one wishes to attain within a specified time frame.

* Types of goals

Outcome: Performance comparisons to others

Performance: Performance Comparisons to oneself

Process: Tactical, behavioral, technical.

*The Purpose of goals?

↑ **Focus**

↑ **Motivation**

↑ **Accountability**

*Effective Goal setting Strategies (SMARTTEST)

Specific

Measurable

Achievement Strategies

Realistically challenging

Time Bound

Exhibit

Seek Support

Target Obstacles

Appendix K
Goal Setting Construction Worksheet

Goal Setting Construction Guide/Script
(Latham, 2003; Latham & Locke, 2007)

(Numbers correspond to the question number in the goal setting worksheet)

1. Just write down any kind of general aerobic fitness goal (ex. move faster, exercise more often, better cardiovascular endurance/shape, etc.)
2. Make sure goal is measurable (ex. I want to break a 6 minute mile, exercise at least 5 times a week for at least 45 minutes, be able to run for an hour straight without stopping, ect.)
3. List all activities you can think of that would enjoy doing that is conducive to your fitness goal. If you have any questions about an activity or want suggestions for an activity, you can ask me.
4. Before answering this question you must fill out the time management guide. After filling out the time management guide then answer both questions to #5.
5. The more people you have helping you achieve your goal the more likely you will actually attain the goal. This could be a workout buddy, a friend or family member who will you can share your goals with, or go to a 'pick up' sporting game like volleyball, basketball, or soccer at the rec center.
6. Try to think of as many things that can possibly prevent you from obtaining your goal (ex. schoolwork, family, laziness, distractions, etc.), then try thinking of ways to overcome those obstacles. If need suggestions for overcoming these obstacles, you can come talk to me.
7. Progress must be realistic and measurable (ex. I will have increased my mile time by 5 seconds, lose 3lbs, increase vertical jump by 1 inch.)
8. In the activities column list the aerobic activities you intend on engaging in for the remainder of the week (starting with today). In the duration column list the estimated amount of time you intend on engaging in these aerobic exercises (in minutes). In the intensity column, circle whether the intensity of the activity is moderate or vigorous. Refer to the physical activity log or ACSM worksheet to distinguish which physical activities are moderate or vigorous.

GOAL SETTING CONSTRUCTION WORKSHEET

NAME:

DATE:

1) Write down a general fitness goal you would like to accomplish by the end of the quarter.

2) Measurably, how will you know when you have reached your goal?

3) List the type of exercises or activities you will do in order to accomplish this goal?

4) How many times a week do you intend on engaging in the above exercises or activities?
How long will you engage in these activities per exercise session? (Refer to time management sheet).

5) Who else can help you achieve this goal? What can you do to obtain their support?

6) What challenges do you foresee that would inhibit your attainment for this goal and how do you plan to overcome them?

7) How would you like to see your goals progress one week from now?

8) List the aerobic physical activities below that you intend on engaging in on each day of the week. Also list the duration as well as the intensity of these exercises.

DAY	Activities	Duration (MIN)	Intensity (Circle one)
MON			Moderate / vigorous
TUES			Moderate / vigorous
WED			Moderate / vigorous
THU			Moderate / vigorous
FRI			Moderate / vigorous
SAT			Moderate / vigorous
SUN			Moderate / vigorous

Appendix L

Goal Setting Evaluation Worksheet

Goal Setting Evaluation Guide/Script

(Numbers correspond to the question number in the goal setting worksheet)

1. To answer this, you must refer to the last question of the previous week's 'how do you see your goals progress next week' question.
2. To answer this question, refer to the activities you have listed the previous week (s), and/or question # 4 on your goal setting worksheet.
3. Think of someone who has been involved with attainment of your goal (workout buddy, teammate, friend, family, etc.). How can you increase their involvement for your goal?
4. Think of some things that prevented you from attaining your goal and come up with some potential strategies to combat those challenges.
5. Base your desired weekly goal on this week's progress. Also make sure the goal is realistic, yet challenging.
6. Based on your previous week's schedule and activity log, fill out the physical activities you intend on engaging in for the remainder of this next week.

GOAL SETTING EVALUATION

NAME:

DATE:

1) What was your goal from last week? Did you achieve it?

2) Have you been engaging in the activities you planned on doing the last time you set goals?
List additional or modified activities you may want to engage in for the upcoming week.

3) Who else, besides yourself, has helped you towards your goal? What else can you do to obtain more support for goal attainment?

4) What were some challenges you faced that made it harder to accomplish your goal? What will you do if these challenges or obstacles appear again?

5) Measurably, how would you like to see your goals progress one week from now?

6) Indicate below which physical activities you plan on engaging for next week.

DAY	Activities	Duration (MIN)	Intensity (Circle one)
MON			Moderate / vigorous
TUES			Moderate / vigorous
WED			Moderate / vigorous
THU			Moderate / vigorous
FRI			Moderate / vigorous
SAT			Moderate / vigorous
SUN			Moderate / vigorous

Appendix M
Daily Class activities

DAILY CLASS ACTIVITIES

CLASS SESSION 1: Distribute and discuss syllabus. Distribute and collect Hold Harmless sheet, informed consent form (Appendix C) and Demographics questionnaire (Appendix D)

CLASS SESSION 2: Administer the Exercise Commitment Scale (Appendix A), Physical Activity Log, and the Cooper 12 minute walk/run fitness test (Appendix F)

CLASS SESSION 3: Discuss ACSM exercise guidelines. Only treatment group discusses principles of time management (Appendix I), goal setting (Appendix J), and creating fitness goals (Appendix K). Control group jogs to a planned running route that takes place on and off campus.

CLASS SESSION 4: Aerobic activities – 30 minute run

CLASS SESSION 5: Aerobic activities – 30 minute run

CLASS SESSION 6: Walk 1 minute, jog 2 minutes for 30 minutes around track

CLASS SESSION 7: Walk 1minute, jog 3 minutes for 30 minutes around track

CLASS SESSION 8: Aerobic activities – 30 minute run

CLASS SESSION 9: Swedish run

CLASS SESSION 10: Run 1 lap, walk ½ lap-for 30 minutes

CLASS SESSION 11: Run 2 laps, walk ½ lap- continuous for 30 min

CLASS SESSION 12: Speed training – high knees, strides, sprints, etc.

CLASS SESSION 13: Run 3 laps, run 2 laps, run 1 lap, run ¾ lap, ½ lap, ¼ lap

CLASS SESSION 14: Aerobic activity- 30 minute run

CLASS SESSION 15: Aerobic activity- 30 minute run (Control group does not meet due to Veterans day)

CLASS SESSION 16: Walk 1 minute, jog 3 minutes for 30 minutes around track

CLASS SESSION 17: Run 3 laps, walk ½ lap – continuous for 30 min

CLASS SESSION 18: Trail run on campus

CLASS SESSION 19: Aerobic activity – 30 minute run (Control group doesn't meet due to Thanksgiving holiday)

CLASS SESSION 20: Aerobic activity – 30 minute run

CLASS SESSION 21: On campus jogging scavenger hunt

CLASS SESSION 22 (finals day): Administer Exercise Commitment Scale (Appendix A), the physical activity log sheet (Appendix E), and the Cooper 12 minute walk/run fitness test (Appendix F).

***Due to the holiday of Thanksgiving and Veterans day, the goal setting group only met a total of 22 times, whereas the control group met a total of 20 times.

Appendix N

Data on Experimental and Control Group

Experimental Group Demographics Data

Part	Gender	Age	Credits	Work	Run
1	F	21	12	0	0
2	F	21	12	0	1
3	F	20	15	0	0
4	F	20	10	0	0
5	M	23	15	0	0
6	F	21	15	20	0
7	F	20	16	0	0
8	F	26	12	15	0
9	M	22	12	15	1.5
10	F	21	12	0	6
11	M	20	17	15	0
12	F	21	16	0	11
13	F	22	16	15	5
14	F	22	14	40	1
15	M	-	-	-	-
16	F	20	14	7	0
17	F	23	12	0	0
18	M	32	8	20	10
19	F	21	15	0	0
20	F	20	15	0	0
21	F	21	14	17.5	0
22	M	23	12	0	0
23	F	21	17	9	3
24	M	22	12	0	4
Mean	-	21.9	13.6	9.8	1.85

Note. Part = Participant #; Age = age at pre-test; Credits = number of credits intending on enrolling at pre-test; Work = average number of hours employed per week; Run = average number of miles per week ran before pre-test; Mean = group mean for each variable.

Control Group Demographics Data

Part	Gender	Age	Credits	Work	Run
1	F	18	15	0	4
2	M	21	13	0	6
3	F	23	12	15	6
4	F	21	13	0	1
5	M	25	16	20	6
6	M	20	19	0	2
7	F	19	16	15	23
8	M	22	14	16	10
9	M	20	13	0	3
10	F	19	20	0	12
11	M	19	14	12	11
12	M	22	12	25	1
13	F	26	2	32	2
14	F	19	17	0	1
15	M	25	18	0	0
16	F	20	16	25	0
17	F	20	14	18	0
18	F	25	12	0	0
19	F	20	17	12	6
20	M	19	18	20	0
21	F	20	15	24	22
22	M	21	12	25	0
23	F	20	15	0	0
24	F	20	15	19	0
25	F	23	12	0	0
26	M	21	10	38	0
Mean	-	21.1	14.2	7.5	4.46

Note. Part = Participant #; Age = age at pre-test; Credits = number of credits intending on enrolling at pre-test; Work = average number of hours employed per week; Run = average number of miles per week ran before pre-test; Mean = group mean for each variable.

Experimental Group Exercise Commitment Subscales Pre-Test Data

Part	Want to	Have to	Enjoy	Const	Altern	Invest	Support	Opport
1	5.7	6.3	7	2	6.2	4.5	6	7.3
2	7.8	8.3	9	8.3	7.4	8.3	9.7	9
3	6.8	6	8	4.3	5.2	5.3	8.7	7.8
4	9.8	9.7	10	6.8	5.2	9.8	10	9.5
5	4.7	2.7	6.7	1.5	4.2	4.8	5.3	5.8
6	6.5	4.7	7.7	1.8	6.8	4.3	9	6.8
7	7.3	8	9	3.8	7.8	4	10	8.5
8	5.3	3.3	7	2.5	6.8	3.5	8.7	7
9	7.7	5.7	8.7	2.3	6.4	6.8	10	8.3
10	8.7	5.3	10	2.3	6	5.8	8.3	8.7
11	7.7	3.7	8	1	4	5.8	9.3	8.2
12	7	5.3	8.3	4	5	6.5	10	7.8
13	9.8	7.3	9.3	4	4.8	7.5	10	8.8
14	6.3	5.7	8.3	1	6.6	4.5	9	7.5
15	8.8	8	9.3	6	5.4	5.5	10	7.7
16	6.5	4.7	7.3	2.5	7.6	3.5	10	7.5
17	7.5	9	7.3	6.5	8	6.8	8.7	8.3
18	8	7.7	7	3.3	4.8	3	7.7	8.2
19	9.7	6	10	3.9	3	7.8	10	10
20	7.5	1.7	9.3	1	6.8	5.8	10	9
21	3.5	6	2.7	3.8	7.8	1	7	1.8
22	6.5	7.7	8	6.3	5.4	1.8	8.7	8.2
23	6.7	5	6.3	1.8	6	5.8	2.7	7.3
24	8.8	8	9	5	3	7.3	9.3	9.3
Mean	7.28	6.07	8.06	3.55	5.84	7.85	8.67	7.85

Note. Part = Participants; Want to = Want to commitment; Have to = Have to commitment; Enjoy = Enjoyment; Const = Social Constraints; Altern = Involvement Alternatives; Invest = Personal Investments; Support = Social Support; Opport = Involvement Opportunities.

Control Group Exercise Commitment Subscales Pre-Test Data

Part	Want to	Have to	Enjoy	Const	Altern	Invest	Support	Opport
1	8.3	7	7	5	5.8	7.3	6.3	7.8
2	7.8	3.7	9.3	5.3	6.2	6.8	8.7	8
3	10	10	10	10	1	10	10	10
4	9	7.7	10	2.3	6.4	6.8	2	9.2
5	5.7	6	8	3.8	6.4	6.3	8.7	7.5
6	8.5	8.7	8	4.5	4	6.3	9.7	8.8
7	9.5	9.7	8	9.3	7.8	6.8	10	8.5
8	9.2	8.7	10	3.3	3.6	9	8	9
9	7.3	7.3	8	4.8	5.2	5	7.3	8.8
10	9.5	9	9.3	5.8	7.2	6	10	9.2
11	9.8	8	9.7	7.3	1.4	10	8.7	9.7
12	6.6	6.3	7.3	3.5	2.8	3.3	6.7	8.3
13	3.7	7	9.3	7	9.2	4.8	3	6.3
14	9	9.7	8	1.8	5.4	8.3	8	6.8
15	6.7	6.3	7.7	7.5	7	7	7	6.3
16	9.3	9.3	8	7.3	5	6	9.7	9.8
17	6.8	5	9	5	6.6	8	8.3	8.7
18	3.3	1.7	4.3	4.5	9.4	2.8	4.7	7
19	6.8	3.7	9.7	1.8	3.8	2.5	10	9.2
20	9.7	8.7	10	4.8	4.4	9.8	9	9.3
21	10	7.7	10	5.3	3.2	9	10	9.8
22	6	5	7.7	1	5.4	4	8	7.3
23	5.8	6	3	3	5.4	3	8	5.7
24	6.2	6.3	7.3	5.3	5.4	4.3	8.7	7.7
25	3.7	5	5	2.3	3.8	2.5	2.7	7.2
26	4.8	6.3	9	3.8	6.4	3	9	8.8
Mean	7.43	6.91	8.18	4.79	5.32	6.08	7.77	8.26

Note. Part = Participants; Want to = Want to commitment; Have to = Have to commitment; Enjoy = Enjoyment; Const = Social Constraints; Altern = Involvement Alternatives; Invest = Personal Investments; Support = Social Support; Opport = Involvement Opportunities.

Experimental Group Exercise Commitment Subscales Post-Test Data

Part	Want to	Have to	Enjoy	Const	Altern	Invest	Support	Opport
1	6.2	6.7	5.7	2.5	7.4	5.3	7.3	7.5
2	7.7	8.7	7.7	8.8	7.8	8.5	9.3	8.8
3	9	6	8.7	4.5	6	8	10	8
4	9.5	7.7	9	6.8	4.8	8.5	9.7	8.5
5	6.5	5.3	6.7	6.3	6	7.5	4.7	4.8
6	8.2	8.3	8	3.5	6.8	5.8	9.3	8.7
7	6.7	1	7.7	1	8.2	1.8	8.7	6.5
8	5.8	7.3	8.3	1	7.6	6.8	6	6.8
9	8.7	2.3	9	1.5	4.6	6.5	9.3	8.3
10	7	4.3	7.7	1	7	5	8	6.5
11	6	3.7	8	9	10	7.8	9.7	7.8
12	10	7.7	9.7	2.3	5.4	7.3	9.7	8.7
13	8.5	9.3	8.7	2.5	6.2	6	10	8.2
14	9.5	9.3	10	9	6	8.5	10	9.3
15	6.5	7	8	2.8	7.6	5	10	7.5
16	6.8	7.7	8	4.8	8.2	7.3	8.7	8
17	8	7	8	3.5	6	4.5	7.3	7.8
18	9.7	6.3	10	5	8	9.5	10	9.3
19	8.5	7	9.3	1.3	6.2	7	10	8.5
20	3.8	7.3	3	4	8	2	8	4
21	6.7	6.3	8.3	4.5	6.4	5.3	8.7	6.8
22	7.8	7.3	7	2.5	5	7.3	7	14.5
23	8.7	9	9.3	5.5	6	9.5	10	8.5
24	5.3	1.7	7.7	3.5	5.8	6.3	8.3	7.2
Mean	7.54	6.43	8.06	4.03	6.71	6.52	8.74	7.94

Note. Part = Participants; Want to = Want to commitment; Have to = Have to commitment; Enjoy = Enjoyment; Const = Social Constraints; Altern = Involvement Alternatives; Invest = Personal Investments; Support = Social Support; Opport = Involvement Opportunities.

Control Group Exercise Commitment Subscales Post-Test Data

Part	Want to	Have to	Enjoy	Const	Altern	Invest	Support	Opport
1	8.5	5.3	8.7	4	7.4	7	7.7	7.3
2	7	4.7	8.3	3.5	4.6	6.3	7.7	8.3
3	10	10	10	9.5	8	9.5	10	10
4	9.2	6	9.7	1.3	6.2	8	5.7	9.3
5	7.2	8	8.7	6	7.2	6.5	9.3	7.7
6	8.7	9.3	8.7	3.8	5.2	8.8	10	9.2
7	7.7	8.7	8	5	9	4.5	10	7.5
8	9.8	9	10	1	6	10	10	10
9	7	7	8	5.8	5.8	5.3	8	7.5
10	9.5	10	10	4.5	9.6	5	10	10
11	8.7	8.7	10	4.5	3.4	9	10	8.5
12	8.8	6.7	8.3	3.5	4.2	5.5	7	9.3
13	6	8.3	8	5.8	9.4	4.5	9.3	7.7
14	6.8	8.3	8.7	2.8	4.6	7	8	6.8
15	6	5.7	8.7	7.3	2.6	4.5	4.7	5
16	9.3	9.7	9.3	4	4.4	6.8	10	9.2
17	7.3	3.3	9	3.3	5.4	7.5	8.3	9.2
18	2.3	1.7	6	1.3	6.2	2.5	1	6.2
19	8.7	7	9.3	1.5	5.2	4.5	10	9.3
20	9	9.3	10	4.8	3.8	9	9	9.8
21	9.2	9.3	10	5.3	6.4	8.5	9.3	9
22	5.8	4.3	7.3	1	5.4	3.8	7.7	6.2
23	3.5	2.3	3.7	3	5	3	5	3.8
24	6.8	7	8	6.5	5.4	5.3	8	8
25	5.2	4.7	7.7	2.3	3.6	3	4.3	7.2
26	7.8	8	7.7	6.5	7	6	7.7	7.5
Mean	7.53	7.01	8.53	4.13	5.81	6.19	7.99	8.06

Note. Part = Participants; Want to = Want to commitment; Have to = Have to commitment; Enjoy = Enjoyment; Const = Social Constraints; Altern = Involvement Alternatives; Invest = Personal Investments; Support = Social Support; Opport = Involvement Opportunities.

Experimental Group Exercise Commitment Behaviors and Aerobic Fitness Level Data

Part	Freq-Pre	Freq-Post	Dur-Pre	Dur-Post	Fit-Pre	Fit-Post
1	3	5	240	180	1609.3	2011.7
2	4	4	178	166	1609.3	1818.6
3	3	3	105	90	1512.8	1818.6
4	4	6	465	300	2623.2	2414
5	4	5	160	195	2011.7	2220.9
6	1	4	30	120	1609.3	2317.5
7	2	3	80	90	2011.7	2220.9
8	0	3	0	105	1207	1705.9
9	2	6	108	215	2591	2719.8
10	5	4	180	260	2108.2	2510.6
11	3	4	360	120	2011.7	2108.2
12	5	5	160	175	2414	2623.2
13	4	3	150	210	1705.9	2414
14	0	4	0	160	1705.9	2011.7
15	0	1	0	40	2414	2011.7
16	2	2	240	60	1818.6	2220.9
17	2	4	65	130	1705.9	2011.7
18	3	3	110	90	2108.2	2719.8
19	4	4	150	155	1609.3	1818.6
20	1	2	35	60	1609.3	1818.6
21	2	2	100	60	1818.6	2011.7
22	4	5	180	210	2414	3315.2
23	2	3	30	270	2011.7	2220.9
24	1	4	30	130	2011.7	2220.9
Mean	2.54	3.71	131.54	149.63	1927.19	2220.22

Note. Part = Participants; Dur-Pre = Exercise Duration Pre-Test; Dur-Post = Exercise Duration Post-Test; Freq-Pre = Exercise Frequency Pre-Test; Freq-Post = Exercise Frequency Post-Test; Fit-Pre = Cooper 12 Minute Walk/Run Fitness Pre-Test; Fit-Post = Cooper 12 Minute Walk/Run Fitness Post-Test.

Control Group Exercise Commitment Behaviors and Aerobic Fitness Level Data

Part	Freq-Pre	Freq-Post	Dur-Pre	Dur-Post	Fit-Pre	Fit-Post
1	5	5	200	240	2011.7	2220.9
2	3	4	220	210	2623.2	2719.8
3	0	6	0	240	2108.2	1818.6
4	2	2	70	60	1609.3	2011.7
5	2	2	30	60	2510.6	2623.2
6	3	4	155	300	2414	2623.2
7	4	3	205	105	2220.9	2317.5
8	3	4	205	120	2719.8	2011.7
9	4	2	195	90	2414	2623.2
10	4	2	270	60	2816.4	2011.7
11	5	3	205	150	3025.6	2816.4
12	3	2	110	60	2623.2	2719.8
13	0	4	0	120	1915.1	2220.9
14	3	2	90	60	1705.9	1818.6
15	0	1	0	30	1818.6	1013.9
16	4	3	130	90	1705.9	2011.7
17	5	3	175	95	2220.9	2414
18	2	4	90	120	2011.7	1915.1
19	4	2	120	60	2011.7	1818.6
20	6	4	880	195	3122.1	3122.1
21	4	3	251	90	2011.7	2011.7
22	1	4	40	150	2317.5	2317.5
23	4	3	120	95	1609.3	2108.2
24	0	2	0	60	1705.9	1818.6
25	2	2	75	60	1416.2	1609.3
26	2	3	80	105	1609.3	1705.9
Mean	2.88	3.04	150.62	116.35	2164.57	2170.13

Note. Part = Participants; Dur-Pre = Exercise Duration Pre-Test; Dur-Post = Exercise Duration Post-Test; Freq-Pre = Exercise Frequency Pre-Test; Freq-Post = Exercise Frequency Post-Test; Fit-Pre = Cooper 12 Minute Walk/Run Fitness Pre-Test; Fit-Post = Cooper 12 Minute Walk/Run Fitness Post-Test.