Goal Setting and Adherence to Physical Activity
of Sedentary Adult Females

by

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B.A., University of Victoria, 1993

A Thesis Submitted in Partial Fulfillment of the
Requirements for the Degree of

MASTER OF ARTS

in the School of Physical Education

We accept this thesis as conforming
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Abstract

The major purpose of this study was to examine the effectiveness of a goal setting training program to enhance adherence and participation in physical activity over a 12 week period. A secondary purpose of the study was to examine the kinds of goals sedentary adult females set for themselves and relate those goals to their physical activity patterns. Subjects were six sedentary adult females, aged 29-42 years, who had recently enrolled at a private women's fitness facility and had no predisposition to illness or injury.

The study was a multiple baseline across single subjects design. Results suggested that while the use of goal setting strategies did not increase physical activity above baseline levels, they did provide five out of six individuals with some direction and motivation in their physical activity programs for the intervention period. Five of the six individuals met their short term goals for the majority of weeks the intervention was in place. Six weeks after the study, three of the subjects reported they were still exercising. Two of the subjects reported minimal or no activity after the study had terminated. The final subject performed little or no physical activity during the study because she found she was pregnant and had felt ill for the 12 weeks of the study.

Examples of the general goals (attainable four or more weeks from when the study began) listed by the individuals included to make physical activity a habit, to prevent disease, to feel better about oneself, to lose weight and to feel more energetic. Short

term goals set within the intervention period varied according to each individual's schedule, current self-reported fitness, and personal activity preferences.

Results were discussed with reference to factors that were of importance. These included self-efficacy, commitment to goals (as inferred by effort), adjustment of goals, social support, barriers to physical activity, and the stages of change in exercise behavior.

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Acknowledgements

I would like express my gratitude and thanks to Dr. Bruce Howe for his guidance, advice, expertise and sense of humour throughout the process. I also wish to thank Joan Wharf-Higgins and Dr. Joe Parsons for their suggestions and "speedy reading" of the very long, "rough" draft of my thesis.

Special thanks go to Kathy Cameron and Charlene Klasema who were always there to offer advice, discussion, emotional support and friendship throughout my study. Also, many thanks go out to the women who participated in my study for their kindness and co-operation. I would especially like to thank Gary Brown - words cannot express what I feel he has given me. I will say, without him, my graphs may not have been possible!

Finally, I would like to thank my family who have supported me (financially and emotionally) throughout my long-standing career as a professional student - and I might add I hope they continue to do so. A special thank-you is extended to my sister Maureen who always listened (day or night).

Chapter I

INTRODUCTION

Exercise and physical fitness have consistently been identified as behavioral interventions likely to reduce morbidity and mortality (Paffenbarger & Hyde, 1984). In addition, the benefits attributed to physical activity have included the enhancement of both physiological and psychological well-being (McAuley, Wraith & Duncan, 1991; Tomporowski & Ellis, 1986).

Despite these findings, exercise professionals still find attracting individuals to an exercise program is easier than keeping them there (Willis & Campbell, 1992). It has been claimed of those that begin an exercise program, approximately one half drop out within the first six months, with most of the attrition occurring in the first two to four months (Wankel, 1987). Additionally, according to Dishman (1987) the same percentage of those who decide to enter a community exercise program have experienced previous failures in adhering to such programs. Therefore, identifying variables which influence and enhance early or initial adherence appear to be necessary to increase maintenance in exercise programs.

Naturally occurring social and material contingencies have not proven sufficient to shape and maintain regular exercise. If individuals are to increase their physical activity, two possibilities exist: either change is needed in expectations, social and material contingencies and experiences with exercise throughout the lifespan, or the individual

must increase physical activity, despite adverse social and environmental influences (Knapp, 1988).

In the past, a common method of studying adherence to exercise and physical activity has been a screening/correlational approach. Review articles written on this topic have found factors which relate to the individual such as biographics (ie. age, gender, education and biomedical status), and knowledge, attitudes and beliefs (ie. perceptions of the benefits of exercise, self-efficacy or confidence in being able to successfully perform physical activity) to be mild to moderate predictors of exercise adherence (Dishman, 1993; King & Martin, 1988; King, Blair, Bild, Dishman, Dubbert, Marcus, Oldridge, Paffenbarger, Powell & Yeager, 1992). However, these approaches have relied on differences between groups and have therefore not allowed for the prediction of individual behavior. As a result, the screening information has not been able to be applied in any practical way to examine individual adherence to physical activity (Dishman, 1982).

A second method of studying adherence has been an intervention approach, which has attempted to enhance or increase participation in exercise and physical activity. Studies done in the past 10 years to increase physical activity or exercise behavior have combined varying features of either behavior modification or cognitive behavior modification strategies. They include interventions such as behavioral contracting which enhanced attendance in jogging and aerobic dance (Wysocki, Hall, Iwata & Riordan, 1979), the use of behavioral contracting and a separate attendance lottery procedure which enhanced attendance in aerobics programs (Epstein, Wing, Thompson &

Griffin, 1980), motivational balance sheet procedures, which require the listing of costs and benefits to oneself as a result of exercising to increase weekly attendance in exercise programs (Hoyt & Janis, 1975; Wankel & Thompson, 1977; Wankel, Yardley & Graham, 1985), and studies of individualized feedback and praise provided by an instructor during exercise which resulted in better attendance than group-based feedback (Martin, Dubbert, Katell, Thompson, Raczynski, Lake, Smith, Webster, Sikora & Cohen, 1984). Self-administered reinforcement strategies have also yielded enhanced attendance when combined with self-monitoring, reinforcement from a significant other, or self-contracting and self-monitoring (King, Taylor, Haskell & Debusk, 1988; Noland, 1989; Turner, Polly & Sherman, 1976).

Other factors have been shown to be important for compliance to exercise. These include convenience of the exercise facility (Andrew & Parker, 1979), social support (King et al., 1988; Wankel et al., 1985), program intensity (ie. mild to moderate intensity was superior to high intensity) (Oldridge, 1984), enjoyment (Wankel, 1985), and perceived choice of activity (Thompson & Wankel, 1980). However, in spite of these factors being identified, and the knowledge that positive physical and mental benefits will improve by exercise, many people do not exercise enough to experience any lasting improvements in health (Dishman, 1982; Martin & Dubbert, 1982).

A potentially important, yet largely unexplored behavioral intervention in exercise adherence is the use of goal-setting procedures. Most of the current research on goal setting in sport and exercise can be traced to Locke (1968) who, through research in

business and industry, proposed a model of motivation based upon conscious goals and intentions of the individual. Locke hypothesized that specific, difficult goals will lead to higher performance on tasks than easy goals, no goals or general "do-your-best" type goals. These hypotheses were extended to the area of sport when Locke and Latham (1985) hypothesized that goal setting will work as well in sports as it does in business and laboratory tasks. Some field settings in sport have supported various aspects of Locke's theory (Burton, 1989; Hall & Byrne, 1988; Howe & Poole, 1992; Tennenbaum, Pinchas, Elbaz, Bar-Eli & Weinberg, 1991) while others have not (Barnett, 1977; Miller & McAuley, 1987).

A number of studies have explored exercise and goal setting and have shown the effectiveness of goal setting techniques to enhance exercise participation in a variety of settings (Keefe & Blumenthal, 1980; Martin et al., 1984; Turner, Polly and Sherman, 1976). Gender difference research to date has revealed that when females were compared to males, they generally had lower vigorous activity levels. However, when light and moderate activities were considered, the gender difference diminished (King et al., 1992). In view of these findings, it would appear that females might prefer different exercise patterns, and may have different barriers to exercise than males. If this is correct, the general exercise prescription of exercising between 60-90% of maximum heart rate, for 20 minutes, three times per week may neither be suitable nor desirable for many females. If the health benefits of physical activity are to be attained, individuals must adhere to a lifetime of physical activity. However, these benefits may not be obtained by all members

of the population if health and fitness practitioners continue to prescribe exercise doses and intervention strategies which are based mainly on the results of studies on males.

Studies examining the individual, rather than a group, are also of importance if the ***how*** and ***why*** goal setting affects performance are to be understood. Using individual analysis may mean that a factor which was not predictive of group behavior could be identified as crucial for particular individuals (Dishman, 1982). The majority of intervention studies which have used intervention strategies to increase adherence to exercise have failed to take an individual's level of outside or home-based activity into account. It may be that while some individuals have dropped out or not adhered to a particular program, they may still be exercising on their own. It is proposed an individual's level of outside or home-based activity must also be accounted for in order to provide an accurate picture of what constitutes adherence and maintenance to exercise.

The purpose of the present study was to use a single subject methodology to examine the effectiveness of a goal setting training program to enhance adherence to physical activity inside the gym, outside the gym, and in total, over a 12 week period. Six sedentary adult females who had recently enrolled at a women's fitness club participated. A secondary purpose of the study was to examine the kinds of goals sedentary adult females set for themselves and compare those goals to physical activity patterns in order to ascertain if the goals were met during the intervention phase for each subject.

Chapter II

REVIEW OF RELATED LITERATURE

The review of literature will be organized in these three sections. First, factors related to adherence and drop-out from exercise and physical activity will be presented. Second, intervention strategies used to enhance or increase participation in exercise and physical activity will be discussed. Third, literature pertaining specifically to goal setting interventions used in sport and exercise will be discussed.

2.1 FACTORS RELATED TO ADHERENCE AND DROP OUT

As mentioned in the introduction, individual or personal factors related to adherence and drop-out from exercise and physical activity have been well researched in the past years. Several review articles have been completed which discuss these factors extensively (Dishman, 1982; Dishman, 1993; King et al., 1992; Martin & Dubbert, 1982) and the reader is referred to these for further information.

In their article, King et al. (1992) summarized the known personal characteristics of physical activity participation in adults, with particular emphasis on women. These characteristics included demographics and knowledge, attitudes and beliefs.

The studies reviewed found lower vigourous activity levels among women than men (when light and moderate activities were considered, the difference diminished). For

both national and community samples, studies have also found that physical activity decreases with age after late adolescence and into early adulthood. The relationship between occupational status and physical activity participation was unclear, with some studies indicating blue collar occupation and low social class were associated with poor adherence (Schoenborn, 1986), and others not. Educational level was found to be positively associated with leisure physical activity, however, it was negatively associated with work related physical activity. It was suggested that these differences may not be present in some populations when structured physical activity participation was considered (King et al., 1992).

Studies regarding smoking status and physical activity levels were of a modest negative relationship (Massie & Shephard, 1971; Schoenborn, 1986), while biomedical status studies revealed a consistent demonstration of healthy people being more active than those individuals with poor health (Dishman, 1981). Additionally, overweight men and women have been shown to be less likely to participate in mild activity (ie. walking) than individuals of a normal weight (Dishman, 1981). A summary of this research asserted that identifying populations as inactive generally depends on the type of activity being measured. For example, females may be similarly active to males when mild and moderate activities are considered, but not when vigorous activities alone are considered.

Research studies reviewed regarding knowledge, attitudes and beliefs found both knowledge of and belief in the health benefits of physical activity to be associated with adoption of exercise and correlated with current participation (Sallis, Haskell, Fortmann,

Vranizan, Taylor & Solomon, 1986). However, these relationships appear to be inconsistent with the maintenance phase of exercise. Studies indicate that even the very sedentary have favourable attitudes toward exercise (Massie & Shephard, 1971). Additionally, one's poor health perceptions and beliefs that exercise has little value may influence the type of activity chosen, and are mildly associated with less exercise participation and sooner drop out in community and cardiac rehabilitation programs . Self-efficacy/confidence has also been associated with both adoption and maintenance of exercise for males and females in structured and unstructured settings (McAuley, 1992; Sallis et al., 1986). The authors concluded by saying that although the previously mentioned factors may correlate with exercise participation, investigations of an experimental nature (ie. intervention studies) are needed to determine whether or not these variables can be manipulated to increase amounts of exercise (King et al., 1992).

Other studies have shown environmental and program factors to be important and consistent factors related to exercise and physical activity compliance. For example, Andrew and Parker (1979) and Massie and Shephard (1971) found that convenience of the exercise facility was related to adherence and drop out from physical activity programs.

In their review articles, Martin and Dubbert (1982) and Dishman (1982) found lack of time to be a principal self-reported reason for dropping out of community and clinical programs. However, this may reflect a lack of commitment or interest in physical activity

rather than an actual time or schedule constraint.

Research done on cardiac patients involved in exercise rehabilitation programs has found program intensity to be a predictor of drop out (Oldridge, 1984). In a large community sample over the course of one year, it was found that more men than women performed vigorous physical activity, while women were more likely to be engaged in moderate physical activity. During a one year period, both males and females were more likely to choose moderate activities over vigorous activities (Sallis et al., 1986). These findings suggest that the level of program intensity may be important, but only during the adoption phase of exercise.

A study by Wankel (1985) conducted interviews with continuing exercise participants and drop outs from a male employee fitness program and found perceived exercise enjoyment and satisfaction to be related to exercise involvement. For example, it was found that drop outs from the program reported losing interest and poor activity selection as reasons for disliking the program. Those who continued reported more positive reactions to the program, reporting a greater overall liking for the program than drop outs.

Similarly, Thompson and Wankel (1980) found perceived choice of activity to be a predictor of frequency of exercise behavior. Their study included 36 female subjects who had recently joined a commercial fitness facility and were asked to indicate their preferences for a number of different exercises. The subjects were then divided into two groups; one group was told their program was based totally on the choices they made; the

other was told a standardized exercise format would be followed rather than their expressed preferences. Both groups' programs actually consisted of activities they had initially selected. A post-test questionnaire indicated that the choice group had greater perceived choice than the no-choice group. Additionally, the choice group had significantly higher attendance than the no-choice group.

It is also reasonable that reconstructing one's past activity history may be important in interpreting not only past and present determinants, but in the designing and implementation of interventions and to predict future physical activity participation. McAuley (1992) examined the perception of personal efficacy and adherence to exercise of both sedentary males and females. Results revealed when examining frequency of exercise, self-efficacy predicted attendance at three months, but not at five months. However, at five months past attendance behavior was a more powerful predictor of future behavior than self-efficacy. Unfortunately, there are no standardized methods to assess lifetime activity history (Dishman, 1991).

According to Dishman (1982), the argument regarding contributions of the person, the situation or interaction between both, has not been resolved or adequately addressed in the exercise adherence literature. Evidence regarding "entry profiles" of the individual suggests that whether or not someone adheres to exercise and physical activity may be "predetermined" for individuals at the outset of a program. Despite this, when carried out, most predictive screening data have accounted for only 17%-45% of exercise adherence behavior (Dishman, 1982).

2.2 INTERVENTIONS

An intervention, as defined by King et al (1992), is a set of specific activities which are designed to enhance increased physical activity in a population. The two main types of interventions used to date have been either behavioral or cognitive-behavioral in nature.

2.2.1 Behavioral

Behavior modification approaches are directed at the individual without an attempt to change beliefs, attitudes or perceptions. Interventions employing this technique use both stimulus (manipulation of antecedent conditions that prompt behavior) and reinforcement (manipulation of consequent conditions associated with increasing activity) control.

A behavior modification study done by Wysocki et al. (1979) attempted to use the reinforcement control strategy of contracting for aerobics points to enhance participation of exercise behavior in a variety of settings. Subjects included 12 undergraduate and graduate university students (7 male, 5 female) ranging in age from 20-33 years. A multiple baseline design was used across groups (group 1 = 6 subjects, group 2 = 6 subjects). Exercise behavior could be performed on an outdoor 440 yard track, an indoor 220 yard track, a 25 yard swimming pool, indoor racquetball courts, indoor and outdoor tennis courts, and within the subjects' homes. Subjects were required to earn a specific number of aerobics points each week. The contract required each subject to deposit six

items of personal value, two of which could be earned back each week, and to outline conditions under which deposits would be refunded. Withdrawal from the group resulted in forfeiture of all items deposited. Four potential subjects withdrew from the study during baseline. Reasons given by three of these subjects were time limitations, while the fourth indicated a preference for non-aerobic activities. Of the remaining eight subjects, control over exercise behavior was demonstrated in seven subjects. Maintenance data one year after the experiment had terminated showed that seven subjects earned more aerobic points at that time than during baseline; while three of these subjects were earning more points than at the end of the contracting condition.

Overall, these researchers concluded that results supported the use of behavioral contracting as an effective technique in the modification of exercise behavior. However, it was also acknowledged that individual goal setting by subjects and subtle increases in social reinforcement for exercise may have contributed to the increase in exercise behavior. It was suggested that future research should study a more careful analysis of the impact each of these variables might have in order to identify the specific factors responsible for these results. Further, researchers need to be aware that individuals with poor exercise histories may not have sufficient skills to participate in more complicated forms of exercise, therefore it might be advantageous to have subjects involved in more than one activity to increase the probability of contact with natural reinforcers associated with physical activity (Wysocki et al., 1979).

Shortly after the above study, researchers Epstein, Wing, Thompson and Griffin

(1980) tested the utility of the contracting procedure for enhancing exercise participation along with a lottery procedure. Forty-one female college students were recruited to participate in aerobics programs over two academic quarters. The study compared attendance for subjects in groups that provided written contracts and a lottery with attendance of subjects in a no-treatment control group. The mode of exercise in this study was jogging. Specifically, the intervention procedures involved assigning subjects to five different groups; three groups used contracts for attendance; one had a lottery for attendance; and one was a no-treatment control. Subjects in the contract groups were required to deposit five dollars prior to the study, and one dollar was returned each week if four out of five sessions were attended. Subjects in the lottery group were required to deposit three dollars prior to the study to purchase a lottery prize. If four out of five exercise sessions were attended per week, the subjects could earn a chance in the lottery. No additional contingencies were given to the control group. Results revealed that the mean number of sessions attended by the three contract and one lottery group were equivalent but all were superior to the attendance in the control group. It was concluded that the behavioral techniques may be useful in improving adherence to an aerobic exercise program and that these procedures may be especially useful in initial training when the majority of drop outs occur. It was suggested that further research should be done using other samples, such as those individuals beginning an exercise program who are older and less fit.

Mode of feedback can also serve as an influential positive or negative reinforcer of

exercise behavior. The importance of the type of feedback was evident in one of a series of studies done by Martin et al. (1984). Using a university community program setting, 143 healthy adults served as subjects in six consecutive studies which took place over a four year period. One of the six studies used personalized feedback versus group based feedback in combination with goal setting. This study found the use of personalized feedback during exercise to be superior to group based feedback for both in-class and out-of-class adherence to jogging. After a three month follow-up, 54% of the personalized feedback subjects continued to exercise three or more times per week on their own, compared with 17% of those who received group based feedback.

2.2.2 Cognitive-Behavioral

Cognitive behavior modification intervention approaches have also yielded promising results with respect to increasing exercise behavior. Cognitive behavioral techniques are directed at changing psychological variables assumed to be mediators of behavior. Similar to behavior modification, these approaches also use antecedent and consequent control.

The use of a motivational balance sheet procedure is a cognitive behavior modification technique which has been tested in several studies and yielded promising results with respect to enhancing exercise participation. Such a procedure requires the individual to write down disadvantages and advantages to both themselves and others when undertaking the modification of a behavior. This procedure is intended to make the

individual more aware of possible unanticipated consequences.

Hoyt and Janis (1975) extended the use of this procedure to exercise. The setting of this study was a women's early morning university exercise class. Subjects were 50 females who were randomly assigned to one of four treatment conditions: relevant balance sheet, which required listing pros and cons for oneself and others as a result of regular participation in exercise classes with either high self-disclosure (entries were read aloud) or low self-disclosure (entries were read silently); irrelevant balance sheet in which pros and cons for one's self and others as a result of abstaining from smoking were listed with high or low self-disclosure. A no-treatment group served as a control. Results showed that the relevant balance sheet procedure had a weekly attendance double of the irrelevant balance sheet subjects, while attendance for the control group was similar to that of the irrelevant balance sheet group. Degree of self-disclosure did not affect attendance.

These results were extended in a study by Wankel and Thompson (1977) and combined both behavior and cognitive behavior modification. Subjects consisted of 100 females, ranging in age from 18 to 62 years. They were members of a fitness club, and had not attended any of the club's programs for at least one month. Subjects were assigned to either a no-treatment control group; a group that received a standard telephone call which asked why the member had not been using the membership and encouraged further use; a decision balance sheet procedure group, reporting both gains and losses to the self; and a decision balance sheet group, who were only to report the positive outcomes expected. After one month, the mean attendance for all groups was low, however, the two

experimental groups had superior attendance than either the control and regular call-up groups. It was concluded that the motivational balance sheet had an effect similar to Hoyt and Janis' (1975) study, but under different circumstances, therefore increasing the generality of the sheet for motivating individuals. Additionally, it was noted that although the treatment effects were significant, the attendance rate was still quite low. As a result, it was suggested that this procedure be used in conjunction with other motivational procedures to provide a more complete program. Another limitation of this study was the use of a group design and the short time span.

Wankel et al. (1985) sought to investigate if there were interactive effects of self-motivation and the decision balance sheet intervention on exercise program attendance. In one of two studies conducted, 52 females who were voluntarily registered in a community fitness program were given the Self Motivation Inventory (SMI) constructed by Dishman and associates prior to the study. Based on SMI scores, subjects were put into high or low self-motivation groups. Four treatment groups resulted: low self-motivated control, low self-motivated treatment, high self-motivated control, and high self-motivated treatment. Subjects in treatment conditions were administered the decision balance sheet procedure. Subjects then participated in a once a week exercise program which lasted for five weeks. Results again supported the utility of the decision balance sheet for improving attendance in the exercise program, with no effect due to level of self-motivation.

In the second study, subjects enrolled in an aerobic dance class were given social support materials which outlined the adherence problem and taught subjects how they

might alleviate "the drop out problem" through enlisting the support of family, friends, buddies, and/or a group leader. Participants were also given social support charts for monitoring their own behavior. Instructors of the program were given instructions on how to implement the structured social support program in their classes. Results indicated that the social support program facilitated attendance, with no effect due to self motivation level as measured by the SMI. A post-study evaluation of the program revealed that leader support, the class attendance chart, in-class buddy-support and general class support were the most important to participants. Overall, it was proposed that no matter which intervention approach participants are given, the program leader likely plays an important role in its success.

Another cognitive behavioral method used in intervention studies has been teaching individuals to prompt and reinforce their own behavior through self-administered reinforcement strategies. King et al. (1988) performed two studies which used elements of stimulus control and tested the effectiveness of self-reinforcement strategies for enhancing adoption and maintenance of exercise. The adoption study had 26 males and 26 females participate in a moderate intensity, home-based exercise program over a six month period. All participants were taught self-directed behavioral strategies such as relapse prevention which involved identifying high risk situations leading to breaks in the exercise program, and self-monitoring which required keeping a daily exercise log of frequency, duration and percieved exertion of activities performed. Adoption group one also received monthly staff telephone calls which offered support and guidance, while adoption group

two did not. Self-reported adherence at the end of the study was slightly higher for adoption group one than for adoption group two.

The maintenance study had 26 males and 25 females as subjects who received instructions identical to those subjects in the adoption study, however, self-monitoring was the main strategy used for maintenance. One group also received a list of adherence tips and guidlines. The subjects who received adherence tips and self-monitoring had a higher number of reported exercise sessions per month over a six month period than those individuals who self-monitored only. Overall, it was concluded that strategies used to promote adoption and maintenance of exercise behavior were different. Maintenance procedures were mainly self-directed in nature (ie. monitoring of individual progress and use of relapse prevention strategies), and adoption procedures involved an element of staff or social support (ie. weekly telephone contact). Another important aspect of this study was the fact that exercise was home-based in nature, allowing individuals to exercise in a less structured and perhaps more easily accessible environment. However, relying exclusively on self-report of home exercise may be problematic because this measure is susceptible to experimenter/subject bias, misrepresentation and deliberate falsification (Martin et al., 1984). It may be that having subjects identify someone who can corroborate self-report of home exercise, or using multiple measures of adherence (ie. self-report of home exercise, self-report of attendance at a structured program which is cross-checked by a date-stamped attendance card) may help to alleviate some of the problems associated with self-report.

Noland (1989) completed a study whose purpose was to compare the effects of self-monitoring and reinforcement administered by a significant other on adherence to a recommended, unsupervised exercise program. Subjects consisted of two primary groups: an adult fitness group, obtained from an ongoing fitness program (35 subjects; 18 males, 17 females), and a NEWS group, who were recruited through a newspaper and were primarily sedentary (45 subjects; 10 males, 32 females). All participants were randomly assigned to either a control group, self-monitoring condition or reinforcement from a significant other condition. All subjects were instructed to perform aerobic exercise for 15 minutes, three times per week for the first four weeks, and then 30 minutes, three times per week for the remaining fourteen weeks. The mode of exercise was left up to the individual. Physiological measures of cardiorespiratory fitness and body density were also taken pre and post-treatment. Results for the NEWS group were that both self-monitoring and reinforcement groups reported a significantly higher frequency of exercise behavior than the control group. This suggested that reward and self-monitoring techniques appear to be helpful to sedentary people who are attempting to adopt and adhere to exercise. Further, the self-monitoring technique was less time consuming and more cost effective than the reward procedure to administer. Additionally, minimal contact such as a brief instruction period and pre/post physiological asessment appeared inadequate when used as behavioral assistance for sedentary individuals. The adult fitness subjects appeared to be exercising about the same amount as the NEWS subjects, at two times per week for 30 minutes, thus the behavioral interventions appeared to have little effect on adherence for

the subjects already involved in a regular exercise regimen.

Using a case study approach, Turner, Polly and Sherman (1976) used elementary behavioral principles, exercise, goal setting and teaching self-control skills for the development and maintenance of an exercise program of a 26 year old female. This individual had been previously sedentary and expressed an interest in beginning an exercise program. Two baseline measures were taken: exercise frequency, which was zero, and a cardiovascular fitness test. The subject was given written materials on goal setting, and self-monitoring. She was also advised to schedule times and days for exercise within her weekly routine in advance. Social consequences such as discussing exercise activities and goals with others which may later serve as reminders to exercise were arranged. Contingency contracting was also used in conjunction with goals. Overall, the subject in this study was able to increase her frequency of physical activity and achieve moderate improvements in her cardiovascular fitness within five weeks of formal training and further improve on three follow-up tests. Although it was suggested that this technique may not prove equally effective with less "motivated" individuals, treatments such as this one may be worth implementing due to their time and cost effectiveness.

Overall, the exisiting intervention literature allows for the conclusion that both behavior modification and cognitive behavior modification strategies can be used in exercise programs to increase frequency of physical activity or time spent in activity in the short term (Dishman, 1991). In their article on exercise applications and their promotion in behavioral medicine, researchers Martin and Dubbert (1982) asserted that too little

attention has been directed at the cognitive, psychological and social variables that might control exercise adherence. It was recommended that an important task is to develop powerful treatment packages that can be tailored to the individual which will produce both home and structured program adherence. Programs should include the use of participant-set exercise goals which can be modified if necessary and reflect individual needs such as personal health goals and limitations (Martin & Dubbert, 1982). Effective behavior treatments might attempt to incorporate three critical factors: motivational factors (establishment of a goal, the decision and desire to change); skills (knowing how to manage and change behavior); and feedback which provides information and reinforcement with respect to progress toward goals. Further, these packages will probably have to vary depending on the type of program (ie. community, rehabilitation) and the type of participants (ie. male, female, obese).

Finally, the Transtheoretical Model of Behavior Change is currently one of the most promising cognitive-behavioral theoretical models which considers the individual critically (Prochaska, DiClimente & Norcross, 1992). Originally, developed for the use of cessation of behaviors such as smoking, this model has been applied to increasing desirable behaviors, such as exercise. The transtheoretical model is thought to be useful for guiding exercise research due to the pattern of relapse in exercise being similar to the relapse curve observed with addictions (Marcus & Simkin, 1994). Using this model, it has been suggested that the success of an intervention may depend on how appropriate it is for the individual. Individuals modifying behavior(s) are thought to move through a series of

stages. These stages are Precontemplation (not intending to make a change); Contemplation (considering change); Preparation (making small changes); Action (engaging in the desired behavior); and Maintenance (change is being maintained over time) (Prochaska et al., 1992). It has been proposed that individuals relapse and recycle through these stages frequently as they attempt to modify behaviors. Treatments or interventions which are effective for some individuals, may not be for others, and this may relate to the stage of change the person is at. For example, action-oriented interventions such as goal setting training may be effective for people at the preparation or action stages of change. However, such interventions may be ineffective with precontemplators or contemplators (Prochaska et al., 1992).

2.3 GOAL SETTING INTERVENTIONS

2.3.1. Goal Setting and Sport

The use of goal setting interventions to enhance adherence to exercise and physical activity is a potentially important, yet largely unexplored behavioral technique. Research on goal setting in sport and exercise largely has its roots in research which began in business and industry and can be traced to Locke (1968) who proposed a model of motivation based on conscious goals and intentions of the individual. Locke and Latham (1984) defined a goal as what an individual is trying to accomplish; it is the object or aim of an action. Prior to 1985, there were very few studies examining the relationship of goal

setting and sport performance. In the hope of generating research in the field of sport, Locke and Latham (1985) wrote an article on the application of goal setting to sports. Their general hypothesis was that goal setting will work as well in sports as in business and laboratory tasks. Based on the organizational literature, 10 specific goal setting hypotheses (1985, pg. 209) applicable to sport were generated:

1. Specific goals will regulate action more precisely than general goals.

2. For quantitative (specific) goals, the higher the goal the better the performance, assuming sufficient ability and commitment.

3. Specific, difficult goals will lead to better performance than goals of "do your best" or no goals.

4. Using short term goals plus long term goals will lead to better performance than using long term goals alone.

5. Goals will affect performance by directing activity, mobilizing effort, increasing persistence, and motivating the search for appropriate task strategies.

6. Goal setting will be most effective when there is feedback showing progress in relation to the goal.

7. With goals that are difficult, the higher the degree of commitment the better the performance.

8. Commitment can be affected by asking the individual to accept the goal, showing support, allowing participation in the setting of goals, in training, in selection, and in incentives and rewards.

9. Goal attainment will be facilitated by a suitable plan of action or strategy, especially when the task is complex or long term.

10. Competition will improve performance to the degree that it leads to the setting of higher goals and/or increases in goal commitment.

Additionally, recommendations were made regarding goals for practice: team versus individual sports, goals during competition, using goals to increase self-confidence, and how to achieve long term goals through the use of short term goals. Following this article, several studies were generated testing and supporting various aspects of Locke and Latham's (1985) hypotheses.

Burton (1989) conducted a field study to investigate the effects of a goal setting training program over the course of a season for a university swim team. More specifically, the study assessed whether the goal setting training program could convince athletes to base their competence on performance goals rather then outcome goals. Further, the study evaluated the impact of the training program on the perceived ability, competitive cognitions, and performance of swimmers. Results indicated that the goal setting training program was effective in enhancing perceived ability, competitive cognitions, and performance of swimmers. Two case studies were also explored which illustrated the successful performance by one athlete when goal setting principles were utilized properly, and the unsuccessful performance that resulted when utilized incorrectly by another. The major strength of this study was that it had extremely high external validity, demonstrating that the goal setting training program was effective for enhancing

cognitions and performance in a "real sport setting." This has implications for the current study which employed a similar goal setting training program with sedentary adult females to increase exercise behavior in a real-life exercise setting.

Providing partial support for the hypothesis that individuals with specific, difficult goals will perform better than those given do-your-best instructions, Hall and Byrne (1988) did a study using a sit-up task. Four goal setting conditions were used: long term goals, long term goals plus experimenter-set intermediate goals, long term goals and subject-set intermediate goals, and a do your best goal. All subjects were to perform four trials of the sit-up task. Results of all experimental trials revealed that groups with either experimenter-set or self-set subgoals differed from the do best goals. By the third trial, the long term goal group improved performance to a level that approached significance over those in the do best group. However, 56% of the individuals in the do your best group reported they had engaged in competition at some point during the task.

Tennenbaum et al. (1991) did two consecutive studies which attempted to test the goal proximity relationship using Hall and Byrne's (1988) methodology. These researchers attempted to control for social comparison or competition effects. In the first study, a control group and treatment conditions of long term goals, short term goals, short term plus long term goals, and do your best were used. A three-minute sit-up task was used. Subjects were allowed to practice the sit-ups once a week for three weeks. During the experiment, subjects practiced the sit-ups twice a week for 10 weeks. Results revealed that the short term plus long term goal group exhibited the greatest performance increase,

although the short term and long term groups also had significant improvements. The do your best group had the least improvement in performance. The second study attempted to replicate and extend the first study's findings using only short term plus long term goals and do your best conditions. Results again indicated that the short term plus long term goal group did significantly better on the sit-up tasks than the do your best group.

In their discussion, these researchers asserted that when social comparison is controlled, short term plus long term goals produce the best performance. However, short term or long term goals alone can also effectively enhance performance. Another interesting finding of these studies was that females tended to do well in do your best goal groups. A suggested reason for this was that females may be more task oriented and therefore flourish under this condition which tends to emphasize one's own goals and personal standards of excellence (Tennenbaum et al., 1991).

Howe and Poole (1992) tested the effects of goal proximity and achievment motivation on basketball shooting performance in a physical education class setting. Subjects were male, grade 10 students. Prior to the study, subjects were classified as either high or low achievers. Subjects in each achievement group were then assigned to either a weekly short term goal group (established each week), a long term goal group (a final test goal), or a short-term-plus-long-term goal group (weekly goals and a final test goal). All forms of teacher-assigned goals had an effect on improving the students' basketball shooting performances, providing no support for the superiority of short term goals over long term goals. There was also the tendency of subjects from all goal conditions to set

their own short term goals. Goals were equally effective for both low and high achievers.

Miller and McAuley (1987) examined the effects of a goal setting training program on basketball free-throw performance, perceptions of success and self-efficacy. Subjects in the goal training group were taught how to goal set for a period of five weeks. Results indicated that the goal-trained group reported significantly higher perceptions of success and self-confidence, however there were no differences between groups on free throw accuracy. It may have been that five weeks was not a long enough time for the goal setting to have a performance effect.

A more recent study by Weinberg, Bruya, Garland and Jackson (1990) investigated whether or not there were interactive effects of goal difficulty and positive reinforcement on an endurance task. Two experiments were conducted. The first experiment assigned 87 subjects to either realistic or unrealistic goal conditions and either received or did not receive positive reinforcement in the form of encouraging statements such as "really looking good", and "keep up the good work." Two control conditions consisted of a do-your-best group and a no-treatment group. The task in this experiment was a 3-minute sit-up task and was performed over the course of 5 weeks. There were no significant effects for the goal setting or positive reinforcement conditions. The second experiment used a hand grip dynamometer task in which subjects had to squeeze the dynamometer for as long as they could. Experimental conditions were similar to those in the first experiment. Results also indicated no significant differences. None of the experimental conditions performed better than the no-treatment or do-your-best control conditions either. These

researchers suggested that "lofty" or difficult goals may be motivating for some individuals but not for others, and that unrealistically high goals do not necessarily undermine performance for all individuals. This was not in accordance with Locke's (1968) goal setting theory which suggested that difficult goals lead to superior performance provided they are realistic and the individual has the ability. Future research called for a more individual approach to be adopted if we are to gain a better understanding of how goals operate in sport and exercise settings.

Finally, a study done by Barnett (1977) prior to Locke and Latham's (1985) article also found no support for Locke's (1968) earlier theory of goal setting on the effects of learning to juggle. Female high school students were assigned to one of five treatment groups: student led interaction with goal setting, student interaction only, teacher pupil conference with goal setting, teacher pupil conference only, and control. All subjects had 16 training sessions, seven of which were used for official test scores. Results indicated no significant differences among groups for the intial, final or post-instruction achievement tests. It was suggested that the goal setting may not have had an affect on performance because it did not occur often enough. For example, subjects were given an initial test, instruction, and practice in scoring before any goal setting took place. Additionally, it is possible that because the task used provided immediate feedback for subjects, all groups may have engaged in some form of goal setting on their own, thus off-setting the results.

Despite the presence of positive results in some of the studies reviewed above, many of the research findings regarding goal setting and its effects on sport performance

remain equivocal. Currently, more research is needed to explore how goal setting operates in sport and exercise environments so that programs and interventions can be developed that not only enhance performance, but the personal growth of the individual in sport and exercise as well (Weinberg, 1992).

2.3.2 Goal Setting in Exercise

Studies which have explored exercise and goal setting have attempted to show the effectiveness of such techniques to enhance exercise participation in a variety of settings. Martin et al. (1984) did a series of six studies over the course of a four year period. Study one, which was previously reviewed earlier in this chapter, regarding the use of personalized feedback also sought to test the superiority of time versus distance based goals in relation to a walking/jogging program for 4 sedentary males and 29 sedentary females. Lasting a total of 10 weeks, the study tested personalized versus group feedback and time based and distance based goals which were individualized and set by an instructor. Results of the study revealed that subjects given personalized feedback with either type of goal or had group based feedback with time goals had significantly better class attendance than those subjects who had group feedback with distance goals. Out of class self-reported adherence was also taken into account and showed a similar pattern of results. Overall, the group feedback plus distance goals group had the highest percentage of drop outs at 86%, and group feedback plus time goals had a 25% drop out rate from the program. For those subjects who received personal feedback plus distance goals and

those with time goals, drop out rates were 10% and 11% respectively. Interestingly, the greatest fitness improvements were in the group with personal feedback and time based goals. A three month follow up revealed few differences between those subjects who received time based goals and those who received distance goals.

Study two was a partial replication of study one. The study lasted 11 weeks. Thirty-four adults (6 males, 28 females) served as subjects. All subjects received personalized feedback and distance based goals. However, goals set were either flexible and participant

set, in which subjects were encouraged to modify daily goals according to how they felt that day, but not to alter their general goals, or fixed and instructor set. Additionally, the use of an attendance lottery was also tested. Four experimental conditions resulted: personal feedback plus fixed goals, personal feedback plus fixed goals plus lottery, personal feedback plus flexible goals, and personal feedback plus flexible goals plus lottery. Results showed no significant differences for lottery versus no lottery on class attendance. Those subjects with flexible goals attended 83.7% of the classes compared to 67.8% attendance for those with fixed goals. The pattern was similar for out of class adherence. The lowest reported drop out rates were in the flexible goal setting groups. Flexible goal groups also had greater post-study fitness improvements over the fixed goal groups. After a three month follow up, 43% of the flexible goal groups reported still exercising, while only 28% of the fixed goal individuals were.

Study three's purpose was to replicate study two's procedures and test for order

effects of flexible versus fixed goals. Thirteen adult females and two males served as subjects for 12 weeks. For the first six weeks of the study, seven subjects were assigned fixed goals, and eight subjects set their own flexible goals. The second six weeks, goal setting procedures were reversed for the two groups. Attendance during the first half of the course averaged 71.1% and decreased to an average of 60.9 % in the second half. Subjects with flexible goals first had an average attendance of 85.8 % compared to those with fixed goals were at 71.4%. Out of class adherence to a third day run was reported as 85% for those with flexible goals for the first six weeks, but their reported adherence declined to 50% during the second six weeks when given fixed goals. Out of class adherence for subjects given fixed goals first was 57.1% for the first six weeks and declined to 25% for the last six weeks when given flexible goals.

The fourth study examined the effects of proximal versus distal goal setting strategies on subject's adherence to a 10 week jogging regimen. Twenty four subjects (20 females, 4 males) were randomly assigned to one of two groups with different goal setting strategies. One strategy was proximal goal setting in which subjects wrote down new mileage goals each week and were instructed to increase their jogging in a way that their goal could be achieved by the following week. The other strategy was to have subjects set distance goals at five week intervals; once at the beginning and again at midpoint. Results showed no significant differences between the two groups on the percentage of distance goals subjects were able to meet, however distal subjects tended to set higher goals. Although not significant statistically, the distal goal setting group's mean class attendance

was 83%, and the proximal goal group's was 71%. Out of class adherence was 46% for the distal group and 32.2% for the proximal subjects. Drop outs were minimal with two from each group. Both groups improved significantly from pre to post study on fitness measures with these improvements not being significantly related to the adherence measures. After a three month follow up, eight out of twelve subjects in the distal group reported exercising three times per week. In the proximal group, four out of eleven subjects were reported they were still exercising, while the remaining seven had relapsed.

The fifth study combined flexible distance goals and personal feedback and the use of cognitive strategies to use while exercising. Five adult males and twelve adult females served as subjects. One group received instructions in cognitive association strategies such as "be your own coach and talk to yourself while you exercise," or to attend closely to internal sensations while exercising and were told to set high personal standards for performance. Another group was also told to set personal goals, however they were instructed in cognitive dissociation strategies such as to attend to other environmental stimuli while exercising. Results revealed superior program adherence for those instructed in dissociative strategies. Self-reported adherence to the third day out of class run was 57.2% for the dissociation group and 46.9% for the associative subjects. At a three month follow-up, seven out of the eight dissociative subjects and three out of the eight associative subjects reported continuing a three times per week walking or running program.

The sixth and final Martin et al. (1984) study combined flexible, distal goal setting

with a relapse prevention procedure. Thirty adult females and five adult males participated. Three experimental groups were used: a basic program, which was the same dissociation strategy program used in study five, relapse prevention in which subjects were to identify factors which might cause a slip in adherence, and relapse prevention with continued contact in which subjects were called and praised for continued efforts. The follow-up and maintenance data were the primary dependent variables targeted for change. Follow-up data had only 22 subjects who attended the training groups on a regular basis. Six of twelve had dropped out of the basic program, three of twelve from the relapse prevention group and four of eleven from the relapse prevention plus contact group. There were no differences observed in groups across maintenance. Interestingly, the four individuals in the basic group who maintained their exercise reported their group's course assistant continued to arrange meetings even after the study ended and several members of the relapse prevention group had formed a social network and continued to run with each other. Only in the continued contact group was there no continuation of social support and comaraderie after the study ended.

In Martin et al.'s (1984) discussion, the present findings of all six studies suggested that for earlier stages of exercise training, an effective treatment package for promoting adoption and maintenance of exercise might include one or all of the following: personalized feedback, a group or social setting, flexible exercise goals set by the individual, and training in cognitive dissociation strategies. It was also acknowledged that the program adherence of 80-85% for these studies may be maximal for such a structured

program given the unavoidable barriers such as family constraints or illness often reported by individuals.

Another important point to note brought out by these six consecutive studies is the current problem with the definition of exercise adherence. Often times exercise is viewed as a dichotomy, classifying the individual as either an exerciser or non-exerciser, as opposed to a continuum involving degree, quality, frequency, and duration. Using a single measure of exercise participation or drop out may not truly reflect the fact some individuals may be exercising on their own (Martin et al., 1984). The studies reviewed provided several measures of exercise adherence such as program attendance, out of class adherence, and percentage of individuals still exercising at a three month follow-up. Therefore, it was felt future studies should incorporate more than one measure of adherence if a true picture of exercise and physical activity particpation is to be gained.

Using a multiple baseline single subject methodology, Keefe and Blumenthal (1980) explored the effectiveness of a gradual shaping procedure on the acquisition and maintenance of exercise. Subjects consisted of three males aged 47, 51 and 56, who were considered overweight for their height and age. All subjects had chronic problems in the past with exercise maintenance. The procedure required subjects to set easily attainable goals for walking, with self-reinforcement for meeting those goals. Results showed that levels of walking improved for all subjects only after each was exposed to the program. All subjects also had a high percentage of goal attainment. At a two year follow-up, all subjects reported they were jogging instead of walking, indicating they no longer relied on

self-reinforcement because they found the exercise to be rewarding.

The researchers concluded that behavioral techniques such as goal setting can have significant benefits in helping individuals address some of the motivational problems they may experience when trying to make exercise a habit.

A more recent study attempted to extend some the goal setting and reinforcement findings in the exercise adherence literature to a clinical population (Perkins, Rapp, Carlson & Wallace, 1986). Similar to Keefe and Blumenthal, the study used a multiple baseline design across individuals. Eight male residents of a nursing home who had medical and psychiatric diagnoses served as subjects. Specifically, the purpose was to explore the effects of a behavioral intervention package which used goal setting/posting with performance feedback and contingent reinforcement on level of stationary bike riding. Maintenance of the exercise changes after a partial withdrawal of the package was further examined. Average increase by the end of the intervention phase was reported as being 75% above the mean baseline riding distance. Increased riding distance was also maintained after stabilization of goals and tangible rewards were discontinued. It was concluded that the study demonstrated goal setting/posting with feedback and contingent reinforcement would improve compliance with medical treament by increasing the level of exercise in a severly disabled population.

Certain methodological flaws present in the above study make the results questionable. Most notably, threats to internal validity such as historical events (ie. possible events being present in some individual's lives making them more or less likely to

comply with treatment); maturational affects such as subjects changing physically or mentally due to medication, and physiological changes due to exercise; reliability of instrumentation used; and possible diffusion of treatment due to some of the procedures used (ie. information about the program and subjects success in a newsletter could have resulted in reinforcement coming from residents or staff, therefore individuals who were not supposed to be receiving contingent reinforcement may have). Future research called for the identification of which components of the intervention were most influential in producing exercise changes and applying these components to various populations in order to generalize across settings, times and behavior change agents.

Poag and McAuley (1992) found habitual, female exercisers in a community setting were not motivated by goal setting to change their exercise behavior. However, it was suggested that goal setting strategies may be more effective for those individuals beginning an exercise program. One possible reason given for this was that because the majority of the sample were habitual exercisers, goal setting may not have served as a mechanism to increase behavior when subjects were already displaying optimal exercise patterns. Additionally, the participants indicated they already recognized the importance of exercise for attaining their goals. Finally, goal setting may not have been effective for these individuals because the goals evaluated by the participants were too general (Poag & McAuley, 1992). As goal setting theory suggests, specific goals may be an important element in the attainment of goals (Locke & Latham, 1985). It was suggested that subsequent research look at a more detailed analysis of goals and achievements in order to

assess the full impact of goal setting behavior.

Kau and Fischer (1974) attempted to establish and maintain the exercise habit in a sedentary female. The mode of exercise used was jogging and reinforcers (ie. money and social activities) were adminstered by the participant's husband. Long term goal setting was also used. Results showed that the individual was able to increase her level of jogging (as measured by aerobic points) over the course of a 12 week period. Formal reinforcement was terminated before the long term goal of 40 aerobic points per week was reached because the natural positive reinforcers of regular physical activity (ie. more energy, weight loss) were being noticed by the individual. Eventually, the long term goal was reached, possibly due to these natural reinforcements.

Another study which was previously reviewed for its use of self-contracting and self-monitoring strategies also used goal setting procedures (Turner, Polly & Sherman, 1976). The female subject in this study was given written materials explaining how to set short term behavioral goals along with a brief explanation. In conjunction with self-monitoring, goals were checked off on a posted graph if an exercise session was completed. Social support in the form of posting the goals where family and friends would see them was also enlisted for goals. Contingency contracts in which behavioral goals were listed and gains and losses if the goals were not reached were also utilized. As already discussed, this individual was able to improve her fitness and increase physical activity levels above baseline. Although this individual's initial reason for beginning the exercise program (a strong need to please her father) was likely a factor in the success of

the study, such strategies were still recommended due to their time and cost effectiveness (Turner et al., 1976).

A final study for review was completed by Tu and Rothstein (1978). This study sought to determine whether "personality" interacted with goal setting in enhancing performance. Subjects were 40 eighth grade females who were classified as being either interdependency motive oriented, having a preference for self-set goals, or dependancy motive oriented, having a preference for instructor-set goals. Subjects were placed into one of two goal setting groups: teacher set-goals or student-set goals. Results revealed that interdependancy motive oriented individuals improved jogging times more quickly and to a greater degree when they were allowed to set their own goals than when goals were teacher-imposed. These individuals also improved more quickly and to a greater degree than dependancy motive oriented individuals in either conditions. The dependancy motivated individuals appeared to do better when goals were teacher-imposed. Overall, the results suggest that plans for utilization of motivational techniques such as goal setting should take the individual to be motivated into account, since there may be different preferences or goal orientations.

Based on these reviews of the literature, the current study hopes to further the goal setting and adherence literature by examining the effectiveness of a goal setting training intervention. More specifically, this study examined the impact of such an intervention on individual female exercise participants and their adherence to exercise over a twelve week period. Further, goals set by each individual were compared to exercise patterns in

order to ascertain if goals were met during the intervention period of the study. It is hoped that using such an approach would allow for factors to be identified and reviewed which may often go undetected in group research.

2.4 RESEARCH QUESTIONS

In relation to the purposes outlined in Chapter I and to the literature reviewed, the following research questions were designed to be addressed within the study.

1. Will females who have recently begun a physical activity program and given training and guidance in goal-setting strategies increase the amount of physical activity performed at the gym over a 12 week period?

2. Will females who have recently begun a physical activity program and given training and guidance in goal-setting strategies increase the amount of physical activity performed outside of the gym environment over a 12 week period?

3. What kinds of goals do beginner female exercise participants set for themselves and are these goals met during an intervention period?

Chapter III

METHOD

3.1 SUBJECT CHARACTERISTICS

Six female subjects between the ages of 29 and 42 years were recruited by telephone. All were members of a women's private fitness club who had joined the club within the previous three weeks. Selection was restricted to those individuals who had not exercised more than one time per week in the previous three months or more, and were free from illness or injury. All subjects, with the exception of subject four, had children. Of those subjects, subjects one and six were single parents. Subjects one, four and six worked full time jobs. Subject five ran a daycare out of her home; subject three was home schooling her three children; and subject two was a housewife. Daily work for all subjects involved light or no physical activity. Subjects one and three reported having been involved in recreational activities such as tennis, ballet and swimming four or more years prior to the study. Subject four had played recreational softball the previous summer. Subject five had been involved in recreational curling one time per week for the past fifteen years and was currently doing so. Subjects six and two did not report any involvement in recreational activities in the past. Reasons for all six subjects beginning a physical activity program included improved health and psychological well-being, weight loss and for enjoyment/fun. Subject three also wanted to retain strong and healthy bones,

while subject six specifically wanted to prevent health risks prevalent in her family history. Subject two reported that she was pregnant within the first week of the study, and while the researcher kept in contact with her, she was unable to perform physical activity during the study due to illness.

3.2 PROCEDURES

During the first week of the study, all six subjects were required to attend an information session on how to begin an exercise program, according to recommendations and guidelines from the American College of Sports Medicine (1990). This was led by the researcher (Appendix A). At the initial session each subject completed a physical activity questionnaire designed to assess each individual's past and present physical activity record (Appendix B), provided informed consent (Appendix C), and completed a Physical Activity Readiness Questionnaire (Appendix D).

After completion of the information session, all six subjects were provided with twelve weekly data sheets. Sheets required subjects to list: type of activity, duration, heart rate (in beats per minute), whether the activity was performed in a group, with an individual or partner, and where the exercise was done. Subjects were instructed to record any exercise/activity carried out for at least 15 minutes, either inside or outside of the gym. Examples of how to record this were provided and discussed. Sheets were collected by the researcher weekly. Subjects were instructed to choose any physical activity they

wished at the gym or outside of the gym, and advised to exercise at least three times per week, at an intensity between 60% and 75% of maximum heart rate. Following the orientation session each subject had their resting heart rate and blood pressure taken by an experienced and certified fitness tester.

All subjects were contacted by the researcher individually at different weeks in the study to receive a cognitive behavioral goal setting training intervention.

3.3 OPERATIONAL DEFINITIONS

Sedentary:

Not engaging in moderate and/or vigorous forms of exercise (60-85% of maximum heart rate) for 15 minutes or more, no more than once per week during the previous three months or more.

Outside Physical Activity:

Any physical activities using large muscle groups (ie. walking, dancing, tennis) , performed for 15 minutes or more outside of the private women's gym of which the subject was a member.

Inside/Gym Physical Activity:

Any physical activities using large muscle groups (ie. cycling, aerobic dance, lifting weights) performed for 15 minutes or more at the

private women's gym of which the subject was a member.

General Goals:

Those goals which the subject hoped to obtain through participation in the study four or more weeks from when the study began.

Short Term Goals:

Goals which could be set and attained either on a daily or weekly basis and might contribute to the attainment of a general goal (s).

3.4 MEASURES

3.4.1 Adherence

Physical activity patterns were assessed in the following ways. Physical activity patterns at the gym were assessed by the subjects self-report of weekly activity and confirmed by a stamped attendance card at the gym. Physical activity patterns outside the gym were based solely on self-reports. The number of times exercised each week were then plotted for each individual on a separate graph for gym, outside and total physical activity. Duration of time devoted to gym, outside and total physical activity was assessed by adding up the reported number of minutes exercised each day and expressed in number of minutes exercised for each week. This was also reported in graphic form for each

individual. Each session had to be 15 minutes or longer in duration in order to be included. Activities which were performed at different times on the same day were counted as separate sessions.

3.4.2 Heart Rate

Subjects were instructed to measure the intensity of their exercise by recording their heart rate. This was expressed as a percentage of maximum heart rate (220 - Age). The desired intensity was then calculated by multiplying the resulting maximum heart rate by the appropriate percentage. For example, if the maximum heart rate was 193 it was multiplied by .75 to determine a 75% maximum heart rate (193 x .75 = 145). After the cardiovascular phase of an activity, subjects were to take their pulse for 10 seconds and then multiply this number by six to get the beats per minute. This number was then compared to their maximum heart rate. Subjects were trained how to do this in the initial orientation session.

3.4.3 Goals

To explore the type of goals set, goal setting manuals which were provided at the start of the intervention phase were inspected for each individual and compared to activity data sheets. A three week re-evaluation of goals was also reviewed to assess the general (attainable four or more weeks in the future) or short-range (weekly set goals) goals. Finally, post-study questionnaires were completed by subjects to assess perceptions of

goal setting strategies with respect to their exercise and physical activity programs.

3.5 INDEPENDENT VARIABLE

The independent variable was the goal setting training intervention.

3.6 DEPENDENT VARIABLES

The dependent variables consisted of the following:

1. Adherence to inside/gym physical activity (self-reported physical activity at the gym and date stamped attendance cards at the gym).
2. Adherence to outside physical activity (self-reported physical activity).
3. Total adherence to physical activity (gym activity + outside physical activity).
4. Types of goals set.

3.7 GOAL SETTING INTERVENTION

Week 1: Day One: All subjects attended a 90 minute orientation session at the University of Victoria on how to begin an exercise program. Each subject received a detailed booklet containing information on how to begin an exercise program (Appendix A). Any questions or concerns were answered by the researcher after the orientation session and throughout the study.

Week 1-12: All subjects handed in weekly data sheets listing inside and outside physical activities performed.

All subjects were contacted at different weeks in the study to receive the goal setting training intervention which was administered in a private room at the gym. Upon administration of the intervention, each subject was given a goal setting booklet which contained information on how to goal set in their exercise and physical activity programs as well as exercises in goal setting (Appendix E). Guidance and assistance on the exercises was provided by the researcher. Treatment was administered according to the following time lines:

35 minutes What is goal setting, potential pay-offs, principles of goal setting, how to goal set, and the dangers and pitfalls in goal setting.

40 minutes Exercises in goal setting (listing goals, both future and short term and developing an action plan for those goals).

Subjects received the intervention at different times and on different days:

Week 4: Subjects one and three (after three weeks of baseline).

Week 5: Subjects five and two (after four weeks of baseline).

Week 7: Subjects six and four (after six weeks of baseline).

Three weeks following each individual's initial goal setting intervention, five out of the six subjects attended a 30 minute re-evaluation session (subject six was unable to attend the scheduled session). This session involved re-listing original goals and assessing

which were being attained and which were not. Any goal not seen as feasible was eliminated. Re-evaluations were scheduled as follows:

Week 7: Subjects one and three.

Week 8: Subjects five and two.

Week 10: Subject four.*

*Subject six's goals were discussed briefly with the researcher at the gym at the beginning of week 10.

Week 12: Post-study questionnaires were administered to all six subjects at the end of this week (Appendix F).

3.8 TELEPHONE FOLLOW-UP

Six weeks after the study had terminated each subject was telephoned by the researcher and asked how often since the study had she engaged in physical activity either inside or outside of the gym.

3.9 DATA ANALYSIS

Data were graphically displayed for each subject over the course of baseline and intervention phases. Physical activity (both inside and outside of the gym) behavior was plotted on a weekly basis for each individual. Historical baselines were established for each individual's physical activity at the gym two weeks prior to the study. Six graphs were plotted for each individual:

1. The number of minutes devoted to physical activity at the gym each week.

2. The number of minutes devoted to physical activity outside of the gym each week.

3. The number of minutes devoted to physical activity each week in total.

4. The number of times physical activity was performed each week at the gym.

5. The number of times physical activity was performed each week outside of the gym.

6. The total number of times physical activity was performed each week.

The graphs were then visually inspected for magnitude and rate of change across the baseline and intervention phases (Kazdin, 1982). The characteristics of magnitude of changes refers to changes in means or changes in level. Changes in means across phases indicates shifts in the average of performance, while changes in level indicates a shift or discontinuity of performance from the end of one phase to the start of the next (Kazdin, 1982).

A characteristic related to rate of change is latency of the change. Latency is the period between the onset or termination of one phase (ie. baseline, intervention) and changes in performance. The closer in time that the change occurs after the intervention is introduced, the clearer the effect of the intervention (Kazdin, 1982).

Changes in means, levels, and variations in latency of change across phases usually accompany each other. However, they are separate characteristics of the data which can

occur by themselves as well. Visual inspection allows for the judgement of the extent to which changes in the above characteristics are prevalent at different phases and if they are consistent with the requirements of a specific research design (Kazdin, 1982).

Goal setting exercises for subjects were examined in order to assess the kinds of goals each individual set. Physical activity patterns during the intervention phase of the study were also examined in relation to the goals set by each individual subject during this phase.

3.10 LIMITATIONS

When reviewing and interpreting the results of this study, the following should be considered:

1. Motivation of the individual at the outset of the study could not be controlled. Each subject indicated different motives for beginning a physical program, and these reasons may have been intrinsic motivators in addition to the goal setting intervention. As a result, some subjects may have been highly motivated for other reasons to begin with, thus the intervention may have had little or no effect.

2. If a subject exercised in a group or class, the effects of leadership and/or group dynamics were not controlled or measured.

3. Reinforcers or contingencies may have been present in the environment. For example, social support networks at the gym or outside of the gym; type of leader or exercise leadership; natural consequences of regular exercise such as weight loss and

feeling good; and having to monitor one's activities may have served to motivate individuals to perform physical activity.

4. There may have been a Hawthorne effect, with subjects adhering to physical activity because they knew the study was on adherence and therefore produced more effort. Additionally, the researcher was present periodically as an employee of the gym.

5. All subjects were recruited from a list of recent members at a local women's exercise facility. As a result, subjects were of middle to high socioeconomic status and therefore may not have been a true representative of normal female exercisers in the population.

6. Physical activity performed outside of the gym relied on a self-report measure and therefore its validity should be questioned.

Chapter IV

RESULTS

The following results are reported in accordance with the research questions outlined in Chapter II. Results will be presented separately for each subject and in the order that the subjects received the intervention.

4.1 SUBJECT ONE

4.1.1 Physical Activity Patterns at the Gym

The number of times the subject engaged in physical activity during baseline and intervention phases is displayed in Figure 1 a. Prior to the study (historical baseline) the gym was attended three times a week. For the remaining three weeks of baseline, the number of times physical activity was performed per week dropped to two times a week and then increased to four times the week before the intervention was implemented. During the intervention phase, physical activity fluctuated between two and three times per week, with the exception of week five (Figure 1 a.). The subject reported being ill for the latter four days of week eight, and this continued for two days during week nine. Overall, the intervention appeared not to have an affect on the frequency of exercise behavior at the gym.

The duration of time devoted to physical activity at the gym is shown in Figure 1 d. During baseline, the number of minutes devoted to physical activity ranged from 57 to 95 minutes. During the intervention phase, the number of minutes devoted to physical activity were lowest at weeks eight (due to illness) and ten. Overall, the number of minutes per week devoted to physical activity at the gym increased from baseline levels for six out of the nine weeks the intervention was in place.

4.1.2. Outside Physical Activity Patterns

The number of times the subject performed physical activity outside of the gym during baseline and intervention phases are displayed in Figure 1 b. During baseline, outside activity was performed two or five times per week. During the intervention phase, outside activity was performed four or more times per week, with the exception of week nine. Overall, the number of times each week physical activity outside of the gym was engaged in changed little from the baseline to the intervention phase.

The duration of time devoted to physical activity outside of the gym is shown in Figure 1 e. During baseline, the number of minutes physical activity was performed each week ranged from 135 and 145. In the intervention phase, the number of minutes increased above baseline levels for four out of nine weeks. The number of minutes decreased below baseline levels for five out of nine weeks. Overall, the intervention did not have an affect on the number of minutes devoted to physical activity.

4.1.3 Total Physical Activity Patterns

The total (gym + outside physical activity) number of times the subject performed physical activity each week is displayed in Figure 1 c. During the baseline phase, total physical activity was performed five or more times each week, with outside physical activity contributing the majority to this total. During the intervention phase, total physical activity was performed six or more times each week, with the exception of week nine, when physical activity was performed five times (Figure 1 c.). Outside physical activity contributed the greatest amount to the total number of times physical activity was performed for all weeks during the intervention, with the exception of week nine. Overall, the total number of times physical activity was performed each week did not change across the baseline and intervention phases.

The total number of minutes devoted to physical activity each week is displayed in Figure 1 f. The total number of minutes physical activity was performed each week during baseline ranged from 192 to 240 minutes. When the intervention was introduced, the total number of minutes increased above baseline levels for four out of nine weeks. The greatest amount of time was devoted to weekly outside activity during baseline, and this continued at weeks four through eight and at weeks ten and twelve. During weeks nine and eleven, gym activity contributed the greatest amount of time to the total. Overall, the total amount of time devoted to weekly physical activity was unaffected by the intervention.

4.1.4 Types of Goals Set

The general goals set by the subject in order of importance were as follows:

1. To lose weight.
2. To increase energy.
3. To tone muscles.
4. To make exercise a consistent habit and part of her lifestyle.
5. To be able to perform sports with her children proficiently.

Short term goals set by the subject were as follows:

1. To work out at the gym three times per week, Saturday, Monday and Thursday.
2. To ride the stationary bicycle at the gym for a duration of 25 or 30 minutes at 70 -75 % of maximum heart rate.
3. To lift light free weights for both upper and lower body, performing 2 sets at 12-15 repetitions of each exercise two or three times each week. One time a week she would try to do 3 sets of each exercise.
4. To walk at an intensity of 70% of maximum heart rate for 15 minutes or more, three or more times each week.

At a three week evaluation, the subject had been achieving her goals of going to the gym three times each week, cycling between 70 - 75% of maximum heart rate, and weight training two or three times each week. The goal of walking at a 70% intensity was not being achieved. All of the original goals were retained for the remainder

of the study, with the exception of walking at 70% of maximum heart rate. This goal was modified to increasing the number of minutes (duration) of walks instead.

4.1.5 Goals and Physical Activity Patterns

In order to provide a full understanding of the results for this subject, the physical activity patterns need to be interpreted within the context of the goals set during the intervention phase.

The subject's goals of going to the gym three times per week, choosing cycling and weight training as the modes of exercise, were met or surpassed for all weeks during the intervention, with the exception of weeks eight (because of illness) and ten. However, the subject did perform outside physical activity six times during week eight and four times during week ten. This may reflect the fact that the subject was advised to perform activities outside of the gym if she could not attend a scheduled gym visit.

The subject's goal of cycling between 70 - 75% of maximum heart rate was verified by the subject's self-reported heart rate for each exercise session. For all cycling sessions at the gym during the intervention phase, this goal was met or exceeded. The cycling sessions during the baseline phase were also performed at moderate intensities according to the subject's self-reported heart rates. The goal of cycling 25-30 minutes per session was met for 17 of 25 cycling sessions during the intervention. For the eight sessions when this goal was not met, cycling was performed between 15 and 20 minutes.

The subject's goal of weight training three times each week was met at weeks four,

five, six, nine and eleven. Weight training was performed only two times each week for weeks seven, eight, ten and twelve. Prior to the intervention, the subject had weight trained twice a week during weeks one and two, and reported doing some weights in week three, but only for ten minutes or less (it did not meet the 15 minutes or more criterion). Thus it would appear that when weight training goals were set, the subject was able to increase either the frequency or the duration of her weight training sessions.

The original goal of walking at 70% of maximum heart rate was not being met during the first three weeks of the intervention, thus this goal was modified to increasing the duration of walks. Duration of walks did not appear to increase for the remaining weeks of the study. Walks performed during all phases of the study were reported as being at 60% of maximum heart rate. Possible reasons for the goal of walking for longer durations not being met may have been bad weather, making it difficult to walk as long or as often, or that the goal was not specific enough.

4.1.6 Post-Study Questionnaire and Telephone Follow-Up

A post-study questionnaire revealed that the subject used some of the goal setting strategies and was committed to attaining her goals. She felt she had achieved her goals of exercising frequently with increased intensity, and had increased her energy level since the study began. She also noted that although she had not yet achieved her long term goal of weight loss, she had lost some weight since the study began. She reported that she would continue to use some of the goal setting strategies in her exercise and physical activity

program. Additional factors reported by the subject as motivators for exercise included music played during exercise, the feeling of being "in shape" and being accountable to the researcher of the study.

Activities performed during the study were rated by the subject on a five point scale (Appendix F). Both gym and outside activities performed during the study were rated as either "enjoyable" or "extremely enjoyable." The subject's confidence in her ability to perform physical activities at the gym prior to the study and after the study were rated on a seven point scale (Appendix F). All activities performed prior to the study increased in confidence ratings post-study. The subject indicated that significant others were neutral (neither supportive nor unsupportive) of her desire to exercise regularly throughout the twelve week study. Self-reported barriers which inhibited the performance of physical activity included the weather (ie. heavy rain in November), sick children, and a busy schedule.

The subject was telephoned six weeks after the study had terminated and asked how her exercise and physical activity program was going since the study had terminated. She indicated that the combination of the Christmas and New Years holidays limited her gym visits as the gym was closed for several days and she had family obligations. However, she indicated that she performed more outside activity over the holidays (ie. skiing), and felt that she was "getting back on track" with her physical activity at the gym.

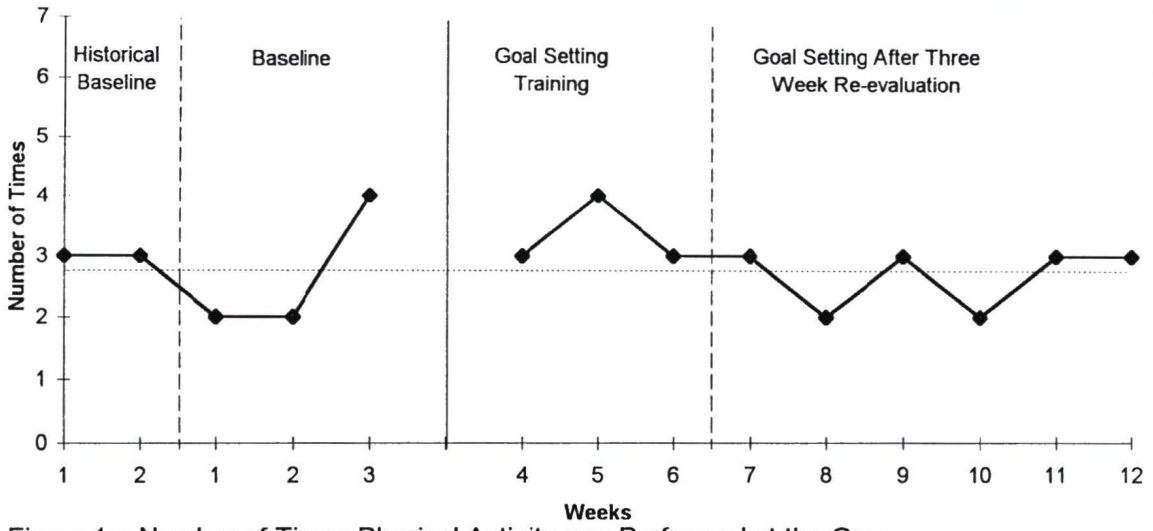

Figure 1a: Number of Times Physical Activity was Performed at the Gym.

Figure 1b: Number of Times Physical Activity was Performed Outside the Gym.

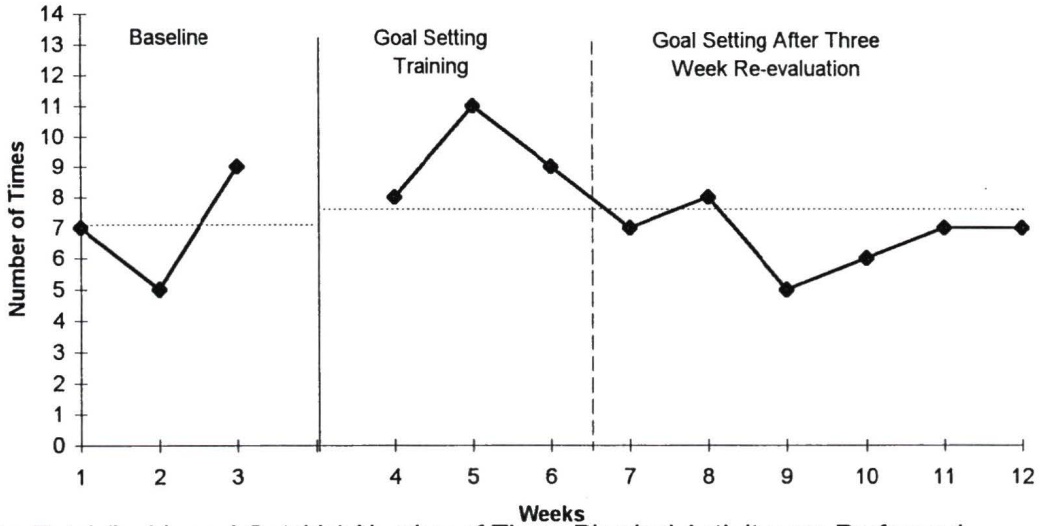

Figure 1c: Total (Inside and Outside) Number of Times Physical Activity was Performed.

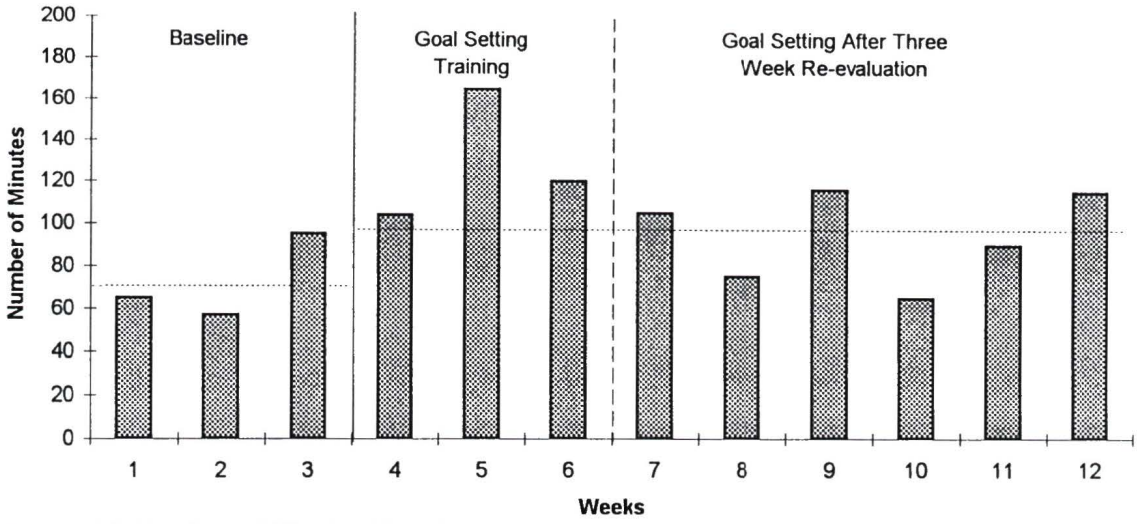

Figure 1d: Number of Minutes Devoted to Physical Activity at the Gym.

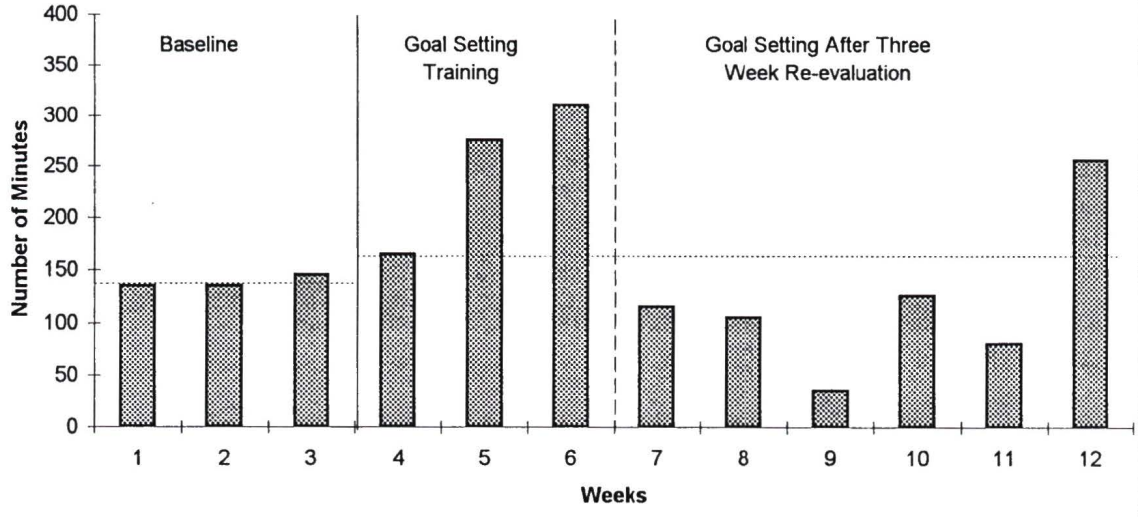

Figure 1e: Number of Minutes Devoted to Physical Activity Outside of the Gym.

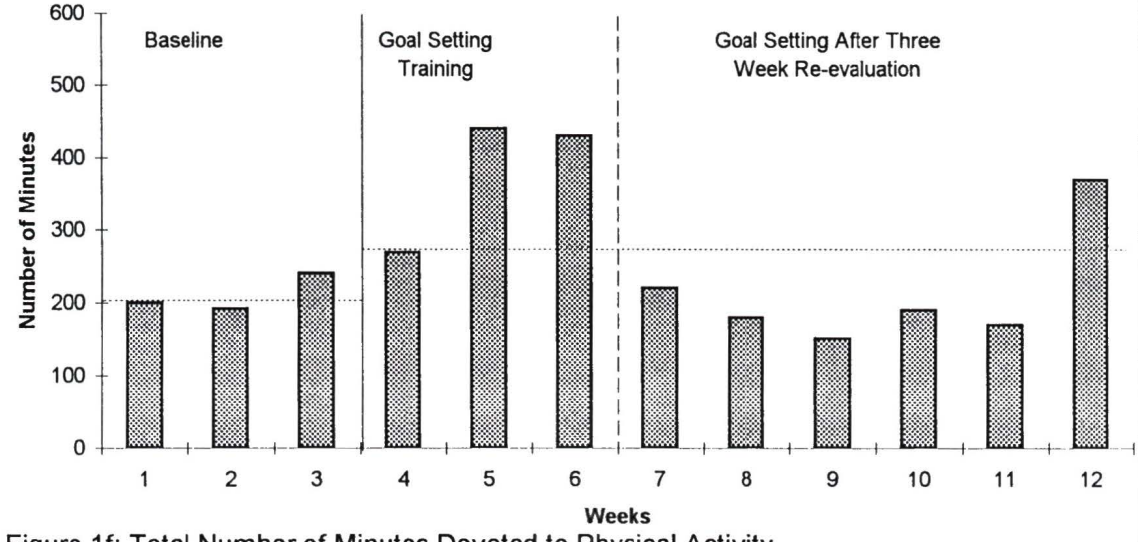

Figure 1f: Total Number of Minutes Devoted to Physical Activity.

4.2 SUBJECT THREE

4.2.1 Physical Activity Patterns at the Gym

The number of times the subject engaged in gym activity each week during baseline and intervention phases is shown in Figure 2 a. Two weeks prior to the study (historical baseline) the gym was attended between three and four times a week. At the start of the baseline phase during the study, physical activity fluctuated between two (the subject reported being ill for three days during week three) or five times. During the intervention phase, physical activity patterns alternated between two or three times each week (Figure 2 a). Weeks eight and nine are missing data due to the subject being ill at week eight and injured at week nine. She took part in no physical activity all during week ten. This may reflect the fact that the subject was advised to resume lower intensity activities outside of the gym until she felt recovered from injury. The pattern of activity resumed at weeks eleven and twelve. Overall, the pattern of exercise behavior at the gym appeared to decrease from baseline levels during the intervention phase of the study (excluding illness and injury, she attained some consistency) (Figure 2 a).

Duration of time devoted to physical activity at the gym is shown in Figure 2 d. During baseline, physical activity at the gym ranged from 135 to 270 minutes. During the intervention phase, the number of minutes devoted to weekly physical activity increased slightly when the intervention was introduced. The number of minutes devoted to physical

activity ranged from zero to 190 minutes. Overall, the number of minutes devoted to weekly physical activity at the gym decreased from baseline levels during the intervention phase.

4.2.2 Outside Physical Activity Patterns

The number of times the subject performed physical activity outside of the gym during the baseline and intervention phases is shown in Figure 2 b. Outside physical activity decreased in frequency from two to zero during the baseline phase. During the intervention phase the subject performed outside physical activity once for weeks four through six and decreased to zero at week seven (Figure 2 b). At week ten she was the most physically active. This may reflect the fact that the subject engaged in outside physical activity, which was of a lower intensity, instead of attending the gym until fully recovered from her injury. Physical activity decreased back to zero at weeks eleven and twelve when gym activity resumed. Overall, with the exception of week ten, the frequency of physical activity outside of the gym did not change from baseline during the intervention phase (Figure 2 b).

Duration of time devoted to physical activity outside of the gym is shown in Figure 2 e. During baseline, physical activity was performed between zero and 120 minutes. When the intervention was introduced, activity level increased to 60 minutes, and decreased thereafter. There was no time devoted to outside physical activity for weeks seven, eleven and twelve. Overall, time devoted to outside physical activity decreased

from the intervention to the baseline phase, with the exception of week ten.

4.2.3 Total Physical Activity Patterns

The total (gym plus outside physical activity) frequency of physical activity each week for subject three is shown in Figure 2 c. During baseline, the subject's total physical activity performance was two or six times per week. During the intervention phase, the subject performed physical activity three or more times each week, with the exception of week twelve (Figure 2 c). Physical activity at the gym contributed the most to total physical activity performed during both the baseline and intervention phases of the study. Week ten was the only exception, with outside physical activity contributing the most to the entire total. Overall, total physical activity decreased from baseline levels during the intervention. However, with the exception of week twelve, the total number of times the subject was involved in physical activity was less variable, with physical activity being performed either three or four times each week.

The total number of minutes devoted to physical activity is shown in Figure 1 f. Time devoted to physical activity decreased from baseline levels, with time devoted to gym activity contributing the greatest amount to the total time during the intervention, with the exception of week ten. During baseline, time devoted to gym activity also contributed the greatest to the total. Overall, the total time devoted to physical activity decreased from baseline levels during the intervention phase (Figure 1 f.).

4.2.4 Types of Goals Set

The general goals set by the subject, in order of importance, were as follows:

1. To make exercise a regular and consistent habit.
2. To have more energy.
3. To feel comfortable about her body.

The short term goals set were as follows:

1. To perform physical activity three times each week. Activities included aerobic dance classes and cycling, Monday, Wednesday and Friday. Aerobic classes would be performed for a duration of 45 minutes or more, and cycling would be performed for 20 minutes or more.
2. Performing the above activities at 70-75% of maximum heart rate.
3. As an alternative, if gym activities could not be performed, outside physical activities such as dancing would be performed at 70-75% of maximum heart rate.
4. To go to bed before 12:30 a.m. in order to obtain a better night's sleep.
3. To organize "fun time" activities with the children in order to incorporate more physical activity into her lifestyle.

At the three week evaluation, the subject felt she had been achieving her short term goals of performing physical activity three times per week at 70-75% of maximum heart rate; going to bed before 12:30 a.m.; choosing alternative activities when gym visits were not feasible and performing them at 70-75% of maximum heart rate; and having "fun time"

with her children. Duration goals for all activities performed were met or surpassed. A new goal of trying a more advanced aerobics class on Mondays was set. It was determined, if she could not attend that class because of a time conflict, she would ride the stationary bicycle or walk on the treadmill before or after a lower level class. All other previously set goals were retained for the remainder of the study.

4.2.5 Goals and Physical Activity Patterns

The physical activity patterns interpreted within the context of the goals set during the intervention of the study are as follows.

When examining total physical activity (gym plus outside), the subject's goal of performing physical activity three times per week was met or surpassed for weeks four through seven, and weeks ten and eleven of the intervention. The subject appeared to be performing outside physical activity on days when gym visits were difficult, therefore when gym activity was performed only two times, outside physical activity was performed at least one time. The two exceptions to this are at weeks ten and twelve. At week ten, gym activity was zero because the individual was recovering from an injury and was advised to perform low intensity activities. Outside activity was at its highest during week ten, possibly because the subject had adjusted her goal accordingly.

Gym activity intensity goals were verified by the subject's self-reported heart rates after the cardiovascular phase of an activity. Intensity goals of exercising at 70-75% of maximum heart rate were met or exceeded for all gym sessions performed at weeks four

through seven, and weeks eleven and twelve. Gym intensity goals were not met for weeks eight, nine and ten due to illness and injury. The goal of performing outside activities at 70-75% of maximum heart rate were also met at weeks four through six. At week ten, outside activities such as walking and swimming were engaged in four times. However, the subject did not report the specific intensities of these activities, but reported they were "low intensity." It would appear for that week, the subject adjusted her intensity goal in response to her physical condition.

The goal set at the three week re-evaluation meeting of trying a higher level class was not met, however the alternative goal of riding the bike or walking on the treadmill before or after a lower level class was met for the remaining three weeks of the study with the exception of week eleven.

The goal of organizing "fun time"activities with her children to incorporate physical activity into the week was also met during the intervention phase of the study. This was evident by the self-reported outside physical activity of dancing "with the kids" for 30 minutes or more each session. This goal did not appear to be met at week twelve, when physical activity was only performed two times at the gym that week, and zero times outside of the gym.

4.2.6 Post-Study Questionnaire and Telephone Follow-Up

A post-study questionnaire revealed that the subject used the goal setting strategies and was committed to the attainment of her goals. She felt she had attained her goals of

going to bed before 12:30 a.m. and exercising on a regular and consistent basis and at a moderate intensity level. She felt she had not achieved her general goal of feeling comfortable in her body, but indicated that she "was getting better." She reported that she would continue to use the goal setting strategies in her physical activity program.

Additional factors reported as motivators for physical activity were the instructor of the Monday night aerobics class, and reading material brought from home when on the bicycle or treadmill. She also indicated that being accountable to the study was extra incentive to get to the gym, however, when a barrier was present (ie. a child was ill) it was added pressure.

The activities performed most frequently during the study (ie. stationary bike riding, low impact aerobics) were rated as either very or extremely enjoyable. Those activities performed least often were rated as only somewhat enjoyable. Confidence ratings in the ability to perform activities before and after the study increased for all gym activities. The subject rated significant others as being extremely supportive of her desire to perform physical activity during the study. Self-reported barriers which inhibited the performance of physical activity during the study included illness, injury, and family obligations.

A telephone call six weeks after the study had ended revealed that the subject had not exercised at the gym as consistently over the holiday period as during the study. However, she reported that she still managed to incorporate physical activity into her week, usually dancing or hiking. It was also reported that she had been going to the gym

for the past two weeks and that it had helped that the study had been there before, making it easier to return to the habit of exercising once the holidays were over.

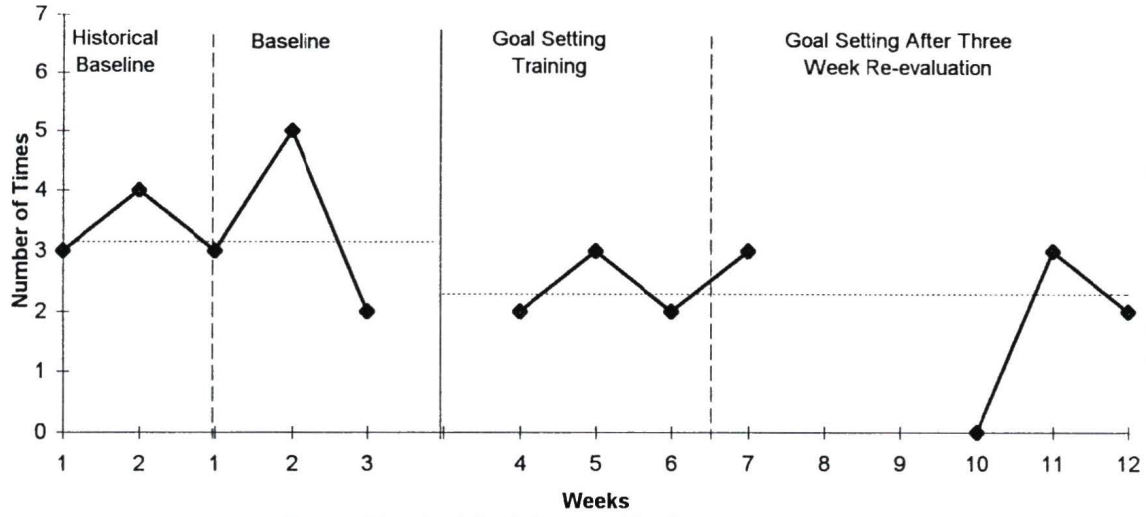

Figure 2a: Number of Times Physical Activity was Performed at the Gym.

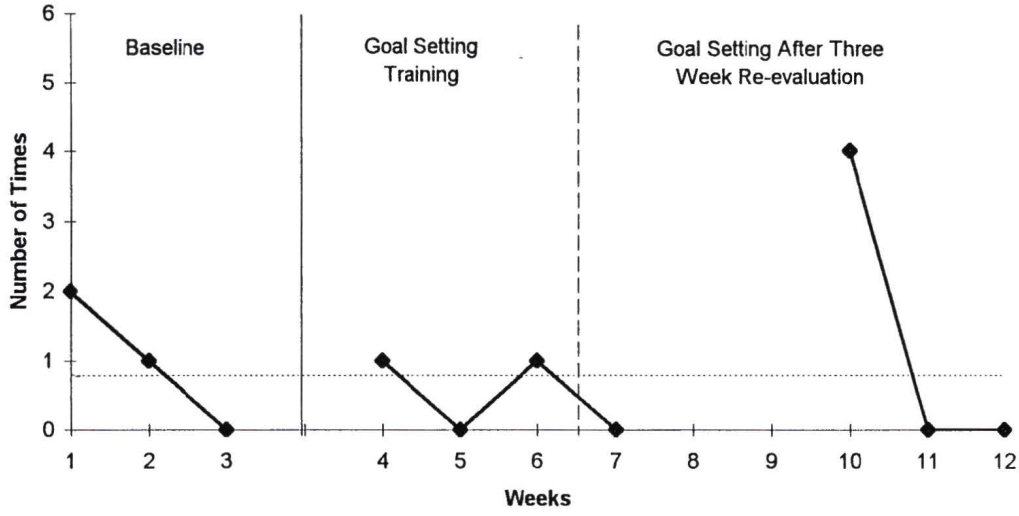

Figure 2b: Number of Times Physical Activity was Performed Outside the Gym.

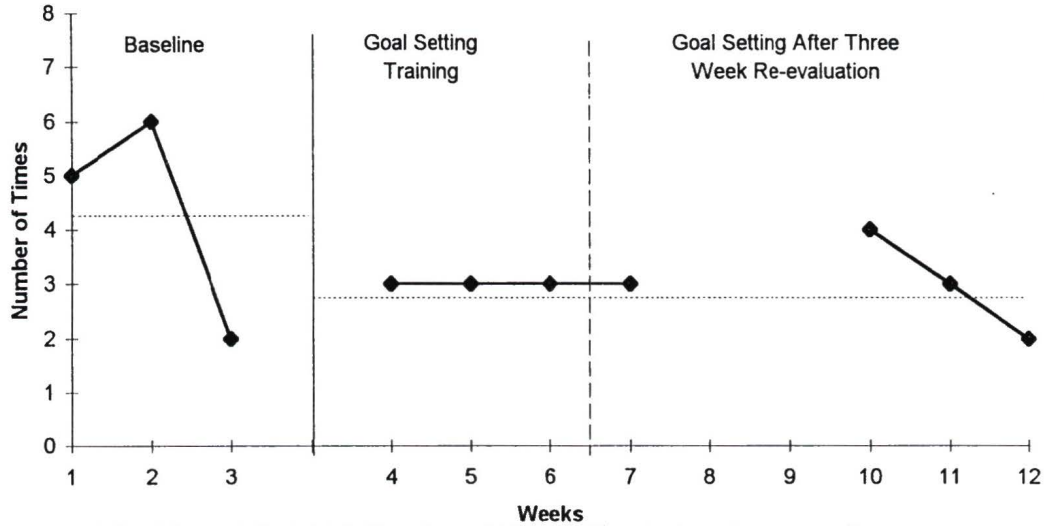

Figure 2c: Total (Inside and Outside) Number of Times Physical Activity was Performed.

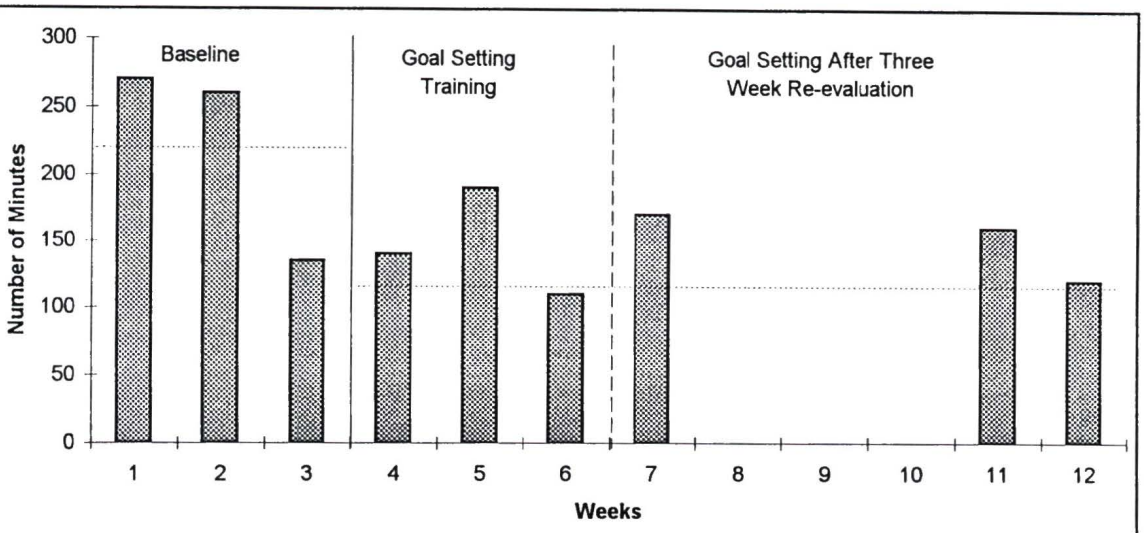

Figure 2d: Number of Minutes Devoted to Physical Activity at the Gym.

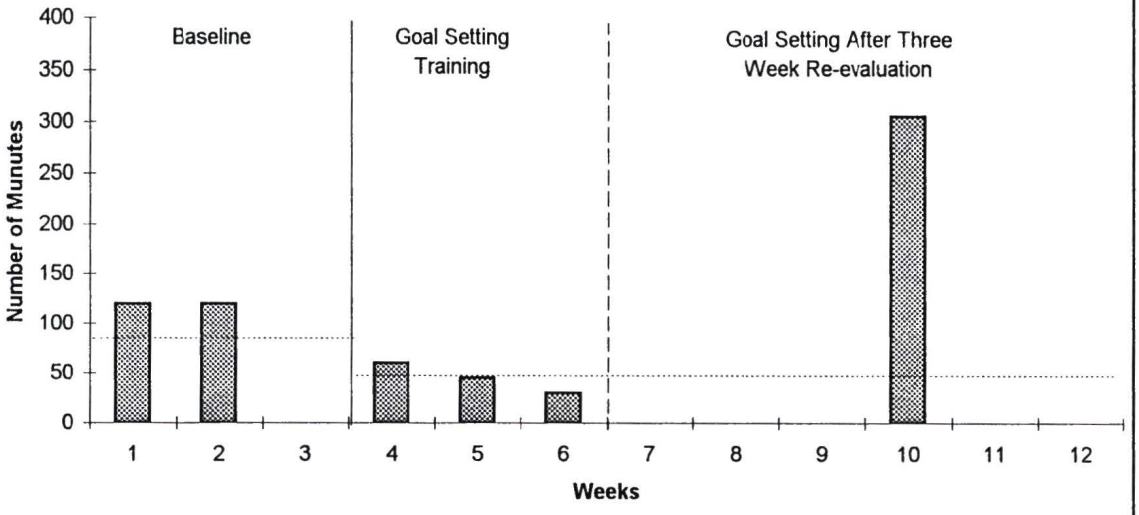

Figure 2e: Number of Minutes Devoted to Physical Activity Outside of the Gym.

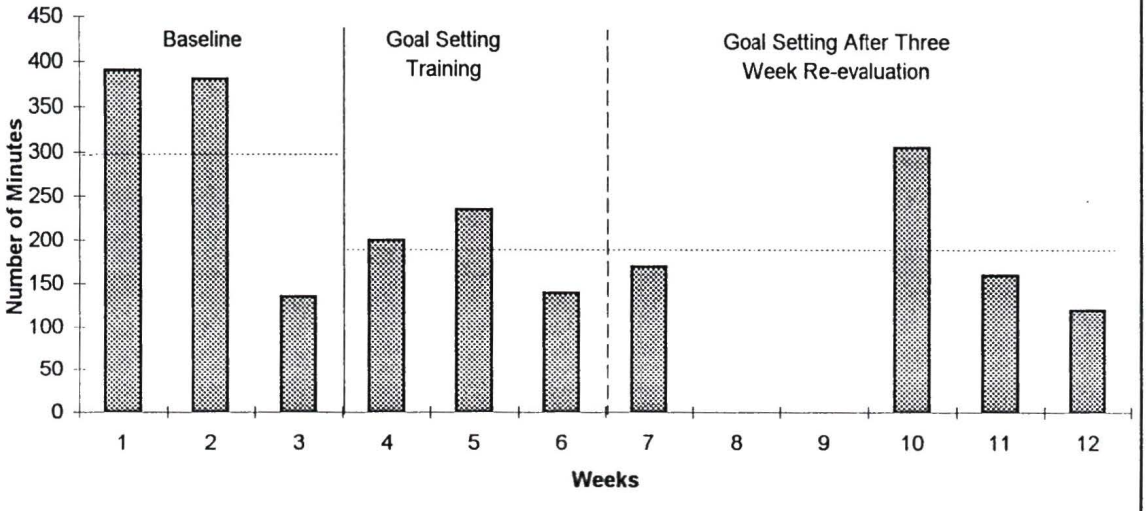

Figure 2f: Total Number of Minutes Devoted to Physical Activity.

4.3 SUBJECT FIVE

4.3.1 Physical Activity Patterns at the Gym

The number of times the subject performed physical activity at the gym is shown in Figure 3 a. During the historical and study baseline phases, physical activity fluctuated between one or two times per week. During the intervention phase, physical activity was performed zero or one time per week, with the exception of weeks three and twelve. For the three weeks when physical activity was not performed, the subject reported being busy setting up a business at home, therefore gym visits were not feasible. Overall, the intervention did not exert any experimental control over physical activity performed at the gym (Figure 3 a).

The number of minutes devoted to physical activity each week is shown in Figure 3 d. The number of minutes physical activity was performed during baseline ranged from 60 to 150 minutes. During the intervention phase, gym activity ranged from zero to 180 minutes. Overall, the number of minutes devoted to gym activity fluctuated on a weekly basis and increased above baseline levels for only two out of eight weeks, therefore the intervention did not provide any experimental control over time devoted to physical activity at the gym (Figure 3 d).

4.3.2 Outside Physical Activity Patterns

The number of times the subject performed physical activity outside of the gym is

shown in Figure 3 b. During the baseline phase, physical activity was performed between two and five times. During the intervention phase, physical activity was performed two or more times for six of eight weeks, and one time per week for two of eight weeks. Overall, physical activity was performed less frequently during the intervention phase and was variable. The intervention did not have an effect on the frequency of outside physical activity.

The number of minutes devoted to outside physical activity is shown in Figure 3 e. During baseline, the number of minutes ranged from 134 to 405. When the intervention was introduced, minutes devoted to physical activity increased for two weeks, and decreased thereafter. Overall, the number of minutes devoted to outside physical activity was variable during both baseline and intervention phases. The intervention did not provide any experimental control over time devoted to outside physical activity.

4.3.3 Total Physical Activity Patterns

The total number of times the subject performed physical activity (gym plus outside) is shown in Figure 3 c. During baseline, total activity was variable, ranging from four or six times per week. During the intervention phase, total activity decreased from baseline levels for six of eight weeks. Total physical activity was performed three or more times each week for five out of eight weeks. Outside physical activity contributed the greatest number to weekly totals for both baseline and intervention phases, with the exception of week twelve. Overall, total physical activity decreased from baseline levels

but was less variable during the intervention phase for six out of eight weeks (Figure 3 c.).

The total number of minutes devoted to physical activity is shown in Figure 3 f. During baseline, the greatest number of minutes was devoted to outside physical activity for three out of four weeks. A similar trend continued during the intervention phase, with time devoted to outside physical activity contributing the greatest amount to total physical activity. Overall, the total number of minutes devoted to physical activity did not change from the baseline to the intervention phase (Figure 3 f).

4.3.4 Types of Goals Set

The general goals set in order of importance were as follows:

1. To lose weight and body fat (as measured by inches).
2. To feel better emotionally and physically.
3. To learn to lift weights.

The following short term goals were set:

1. To lose one or two pounds each week.
2. To attend the gym one or two times each week, choosing low impact aerobic dance classes for an hour, or stationary bike riding for 15 minutes or more per session, as the modes of exercise.
3. To walk outside of the gym for 30 minutes or more, three times per week; one time at 70-75% of maximum heart rate; and two times 60-65% of maximum heart rate.

4. To take instruction on how to lift weights, and weight train the muscle groups of the upper body one time per week for 15 minutes or more; or go to a step and sculpt aerobics class which included 15 minutes of lifting light weights for the muscle groups of the upper body.

At the three week evaluation the subject felt she had been achieving her goals of weight loss, and going to the gym one or two times per week. Goals not being achieved were lifting weights one time per week. Walking was also not performed three times each week, only two times each week at 60-65% of maximum heart rate. A new goal was set of curling one time per week. The goal of weight training was dropped as it was not being attained, but was modified to attending a step and sculpt class once a week. All previously set goals were to be maintained for the remaining weeks of the study.

4.3.5 Goals and Physical Activity Patterns

The physical activity patterns interpreted within the context of the goals set during the intervention are as follows.

The subject's goal of going to the gym one or two times per week was met or exceeded for weeks five through eight and at week twelve. The gym was also attended one or two times each week during the baseline phase of the study. The gym was not attended at all during weeks nine through eleven because gym visits were not convenient due to being busy setting up a home business. It was suggested that the subject modify this goal and try to perform activities outside of the gym instead. For those weeks, outside

physical activity was performed two or three times, decreasing again at week twelve when gym activity resumed. Inferred from this behavior, it would appear the subject had adjusted her goal. Sessional duration activity goals were met or exceeded when activities were performed both inside and outside of the gym. Although not verified or measured by the researcher, the subject expressed throughout the study that she felt she was slowly meeting her goal of losing weight and body fat.

The subject's goal of walking three times per week was not met during the intervention phase. However, walks were performed twice a week between 60-70% of maximum heart rate for weeks five through seven and at week eleven, and one time per week at weeks nine and ten. A possible reason for outside walks not being performed as frequently may have been the inclement weather during that period. Walks were performed three times each week for the first three weeks of the baseline phase when the weather was better.

The goal of curling one time each week was met for all eight weeks during the intervention. Curling was performed one out of the four weeks during the baseline phase.

The subject's goal of weight training one time per week was not met for the first three weeks of the intervention. When modified to attending a step and sculpt class which included some weight training at the gym one time per week, this goal was achieved two times out of the remaining five weeks of the intervention.

4.3.6 Post-Study Questionnaire and Telephone Follow-Up

A post-study questionnaire revealed that the subject used the goal setting strategies in her physical activity program, but was not "committed" to attaining all of the goals she set. She felt she had achieved her long term goals of losing weight and feeling better physically and emotionally. She also felt she had achieved her goal of exercising at the gym one or two times per week for the majority of weeks during the study. She noted she had not achieved her goal of learning to use weights. She reported she would continue to use the goal setting strategies in her exercise and physical activity program. An additional factor reported as a motivator for exercise was being accountable to the study, but only "at times."

All activities performed during the study were rated as being very enjoyable to the subject. The subject's confidence in her ability to perform physical activities at the gym prior to the study increased post-study for all activities engaged in with the exception of lifting weights. The confidence level of lifting weights was rated lower after the study than it was before the study. The subject also indicated that significant others were only somewhat supportive of her desire to perform physical activity during the study. Self-reported barriers which inhibited the performance of physical activity during the study included family obligations, the weather, and preparing for her own home business.

A telephone call six weeks after the study had terminated revealed that the subject had found it difficult to perform physical activity both at the gym and outside of the gym due to family obligations, and the weather. She reported that she was still curling one

time per week and had returned to the gym in the past week and was trying to go two times each week but found it difficult due to a busy schedule.

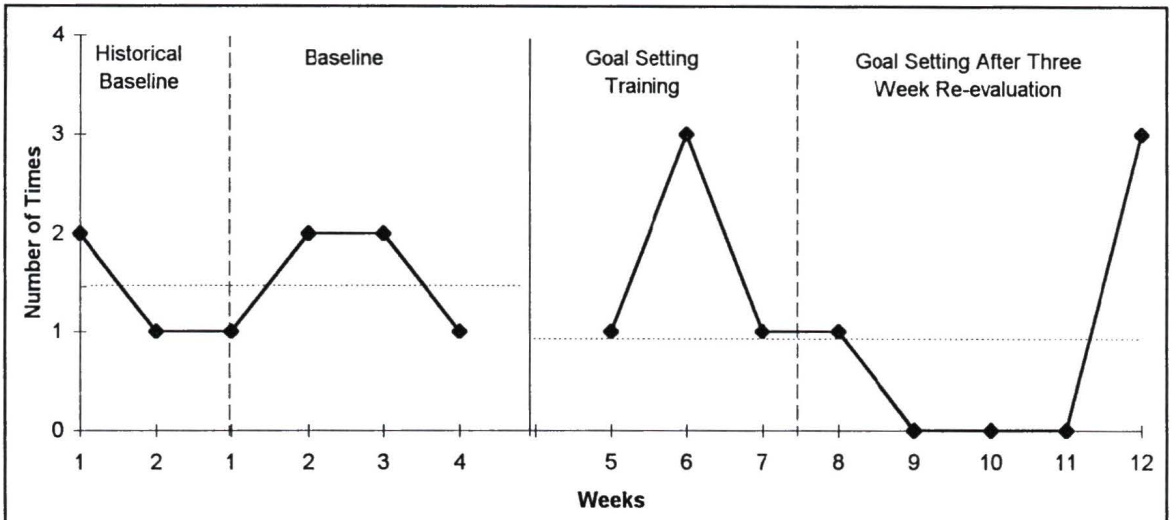

Figure 3a: Number of Times Physical Activity was Performed at the Gym.

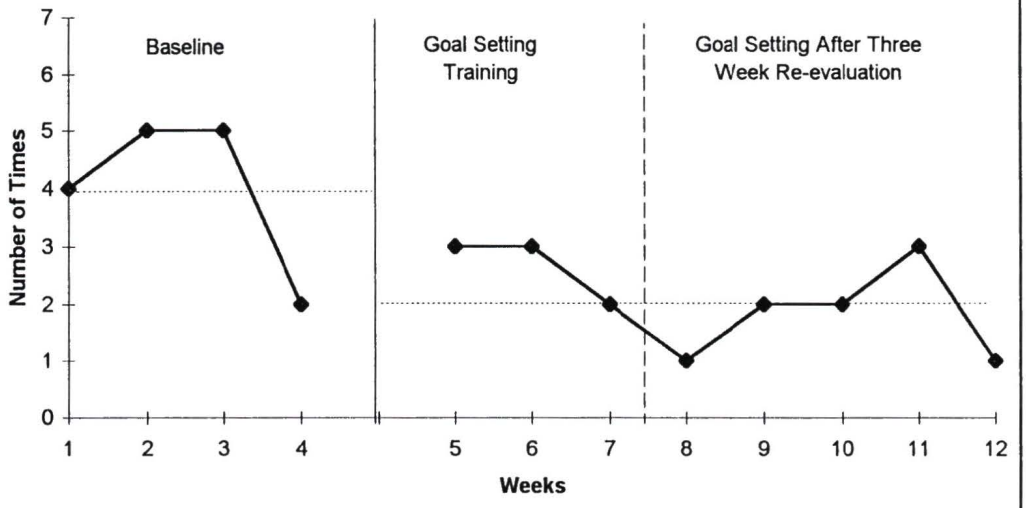

Figure 3b: Number of Times Physical Activity was Performed Outside the Gym.

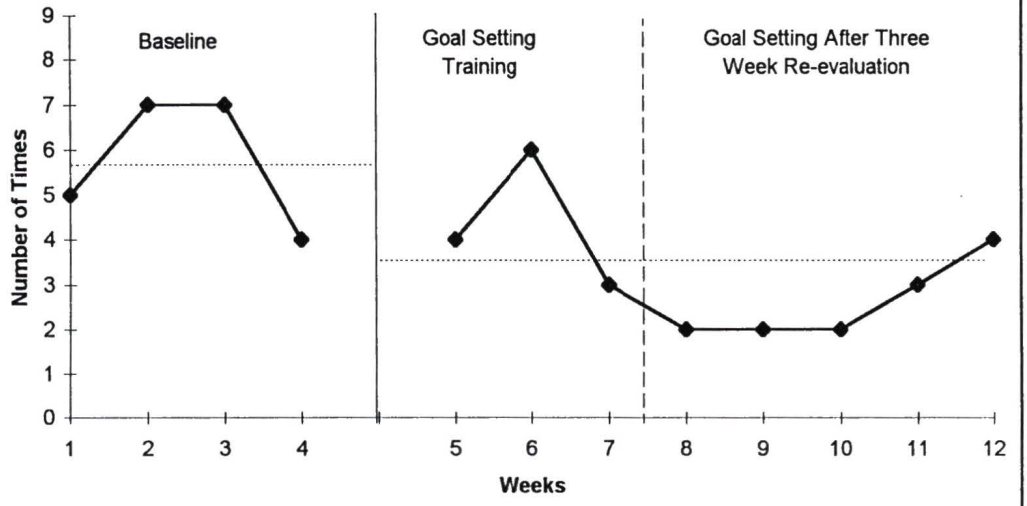

Figure 3c: Total (Inside and Outside) Number of Times Physical Activity was Performed.

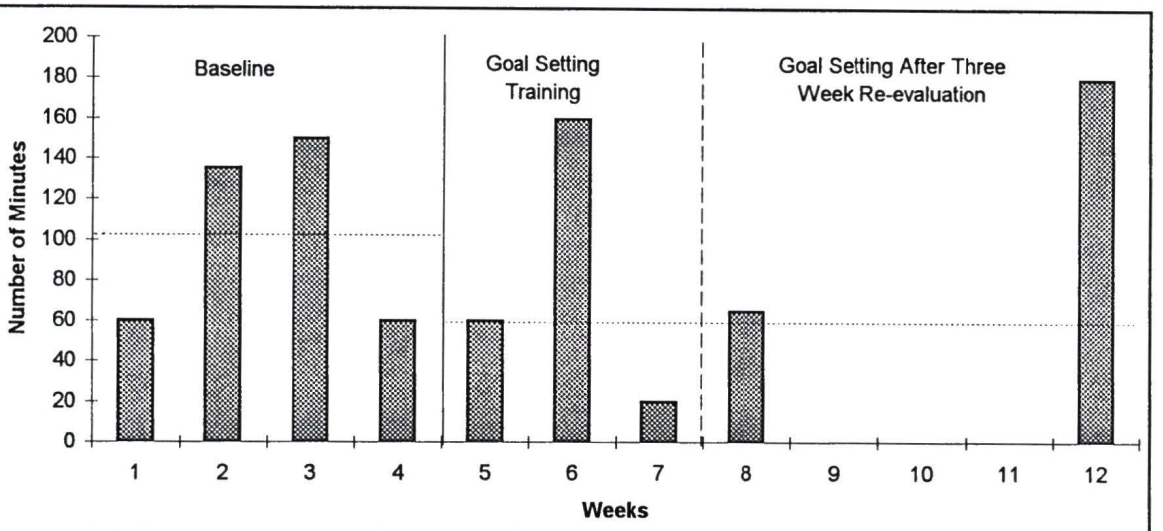

Figure 3d: Number of Minutes Devoted to Physical Activity at the Gym.

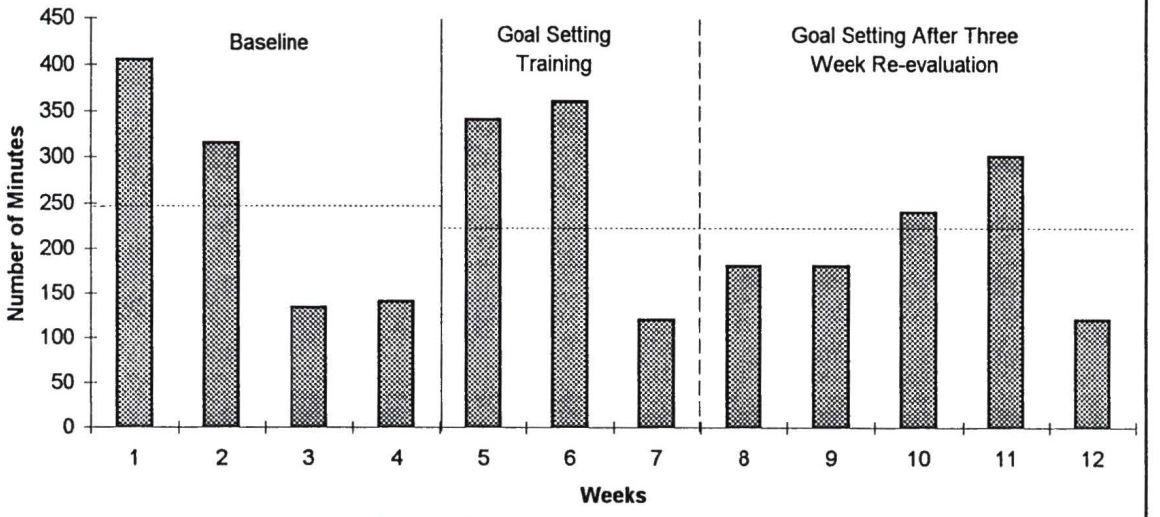

Figure 3e: Number of Minutes Devoted to Physical Activity Outside of the Gym.

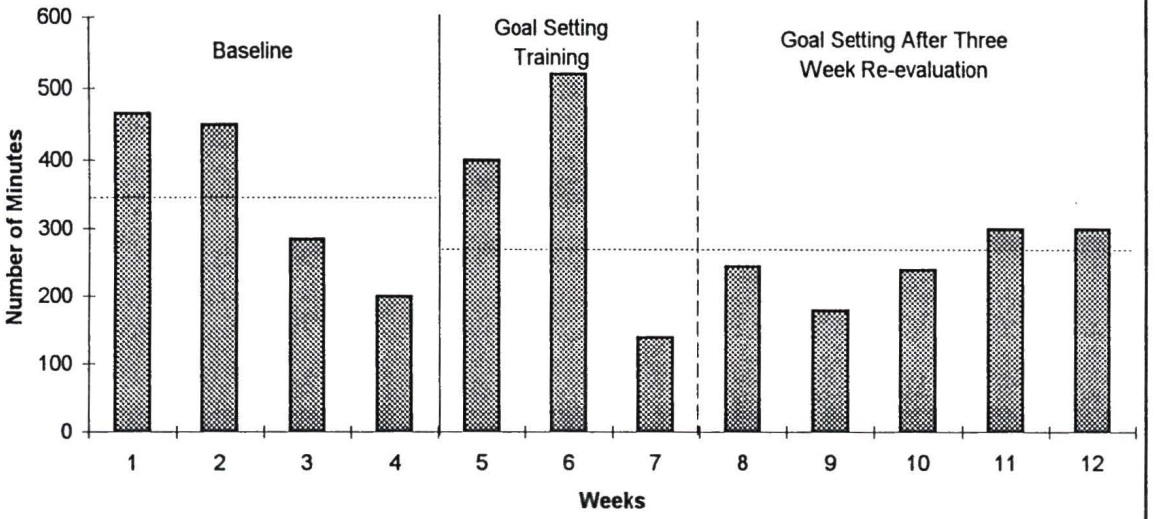

Figure 3f: Total Number of Minutes Devoted to Physical Activity.

4.4 SUBJECT FOUR

4.4.1 Physical Activity Patterns at the Gym

The number of times the subject performed physical activity each week at the gym is shown in Figure 4 a. During the two week historical baseline phase, no activity was performed at the gym. During the six week baseline phase, physical activity was variable. For week three, frequency was zero due to an injury. The subject also reported being ill for the first three days of week five. During the intervention phase the subject performed physical activity two or five times each week, with the exception of week twelve. Overall, the number of times physical activity was performed at the gym during the intervention met or exceeded the highest baseline level for five out of six weeks and appeared to be more consistent than during baseline (Figure 4 a).

The number of minutes devoted to physical activity at the gym is shown in Figure 4 d. During baseline, physical activity was variable, ranging from zero to 170 minutes. During the intervention, the number of minutes devoted to physical activity was above baseline levels for five out of six weeks, however, the number of minutes appeared to be decreasing the last two weeks of the intervention. Overall, the number of minutes devoted to gym activity increased above baseline levels for five of the six weeks the intervention was in place.

4.4.2 Outside Physical Activity Patterns

The number of times the subject performed physical activity outside of the gym each week is shown in Figure 4 b. Physical activity during the baseline phase was variable, being performed one or five times each week. During the intervention, physical activity decreased from baseline levels and then began to increase at weeks nine through twelve. Overall, physical activity outside of the gym increased above baseline levels for only one week out of six, with all six weeks meeting or decreasing from baseline levels, thus the intervention did not exert experimental control over outside physical activity.

The number of minutes devoted to weekly outside physical activity is shown in Figure 4 e. During baseline, outside activity was performed between zero and 140 minutes each week. During the intervention, the number of minutes devoted to physical activity remained at or decreased from baseline levels, thus the intervention had little effect on the number of minutes devoted to physical activity outside of the gym.

4.4.3 Total Physical Activity Patterns

The total (gym plus outside) number of times the subject performed physical activity each week is shown in Figure 4 c. During baseline, total physical activity was performed four times each week, with the exception of week five. Physical activity performed at the gym and outside of the gym during baseline contributed to total physical activity equally at weeks one and four. Outside activity contributed the greatest to the baseline total at weeks two and five. During the intervention phase, total physical activity

remained at baseline levels for four out of six weeks. During this phase gym activity contributed the greatest to the total for three out of six weeks, and equally for two out of six weeks. Outside physical activity contributed the greatest number of times to the total at week twelve only. Overall, the total number of times physical activity was performed did not change from the baseline to the intervention phase.

The total number of minutes devoted to physical activity is shown in Figure 2 f. Total number of minutes ranged from 94 to 170 minutes during the baseline phase. During the intervention, the total number of minutes for each week was similar to baseline, ranging from 115 to 160. The exception was week eight, when the total number of minutes increased well above baseline levels. During baseline, the number of minutes devoted to physical activity fluctuated weekly between gym and outside activity. However, during the intervention, the greatest total number of minutes for seven out of eight weeks were devoted to gym activity. Overall, the total number of minutes were similar for both baseline and intervention phases, with gym activity contributing a higher number of minutes to the total during the intervention phase only.

4.4.4 Types of Goals Set

The general goals set by the subject in order of importance were as follows:

1. To make exercise and physical activity a consistent habit.
2. To incorporate strength training into an exercise program.

The short term goals were listed as follows:

1. To exercise at the gym two or three times per week, for 60 minutes per session, choosing step aerobics classes as the mode of exercise, on Wednesday, Thursday and Friday evenings.

2. To take instructions on how to lift weights and begin to train with weights one time per week, both the upper and lower body's muscle groups for approximately 30 minutes per session.

At the three week re-evaluation of goals, the subject felt she had been achieving her goals of going to the gym two or three times per week and weight training at least one time per week. No new goals were set for this individual, as she indicated them to be challenging, thus all previously set goals were retained for the remaining weeks of the study.

4.4.5 Goals and Physical Activity Patterns

The physical activity patterns interpreted within the context of the goals set during the intervention are as follows.

The subject's goal of exercising at the gym two or three times per week was met for all weeks during the intervention, with the exception of week twelve, when the gym was attended only one time. The number of times the gym was attended before the intervention fluctuated between zero and two times each week for the first five weeks of the study (at week three the subject was injured), and then increased to three times the week before the intervention was introduced. It would appear that the setting of goals may

have provided this subject with some short term direction and motivation in her physical activity program.

The goal of weight training one time per week was met for the first three weeks of the intervention, but not for the final three weeks. The incidence of weight lifting during baseline was zero for all six weeks. The use of goal setting may have provided this subject with some motivation and direction where lifting weights was concerned, but only temporarily.

4.4.6 Post-Study Questionnaire and Telephone Follow-Up

A post-study questionnaire revealed that the subject used the goal setting strategies in her physical activity program and was committed to the attainment of her goals during the study. She felt she had attained her goal of starting to lift weights, but had not maintained it. She also felt she had not managed to exercise three times per week (though she had gone at least two times) on a consistent basis, thus had not yet achieved her general goal of making exercise a consistent habit. She indicated that she would continue to use the goal setting strategies in her physical activity program. Other factors indicated which served as motivators to perform activity were the instructor of the step class and being accountable to the study.

All activities, with the exception of the step class (rated as "extremely enjoyable") and walking (rated as "enjoyable"), were rated as being only somewhat enjoyable. These activities were performed the least often during the study. The subject's confidence in her

ability to perform activities prior to the study did not change from already high confidence levels. The only exception was weight training, which had a low confidence rating prior to the study, but increased after the study. The subject indicated that significant others were very supportive of her desire to perform physical activity regularly throughout the study. Self-reported barriers which inhibited physical activity included lack of motivation and social commitments the last three weeks of the study.

A telephone follow-up call six weeks after the study revealed that the subject had not engaged in physical activity at or outside of the gym since the study terminated. She indicated that the holidays were too busy and made gym visits difficult and the weather made performing outside activity difficult. No longer being accountable to someone (ie. the researcher) also had made a difference. She reported that she had the intention to attend classes at the gym but had not yet gone.

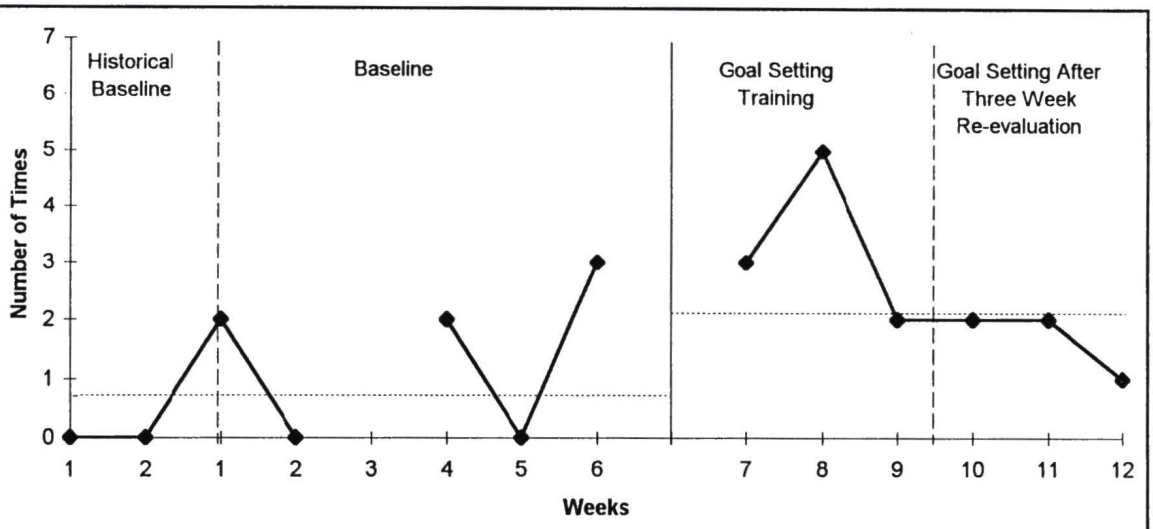

Figure 4a: Number of Times Physical Activity was Performed at the Gym.

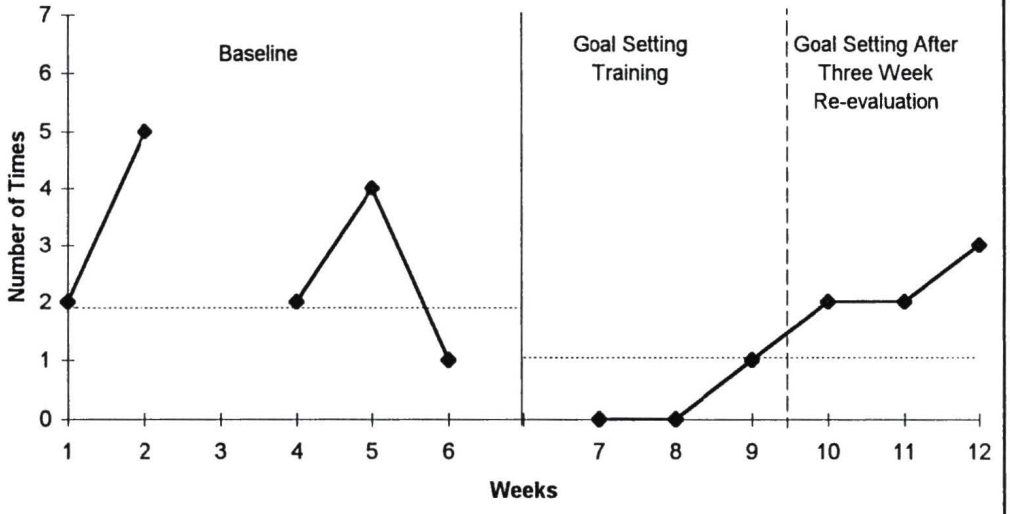

Figure 4b: Number of Times Physical Activity was Performed Outside the Gym.

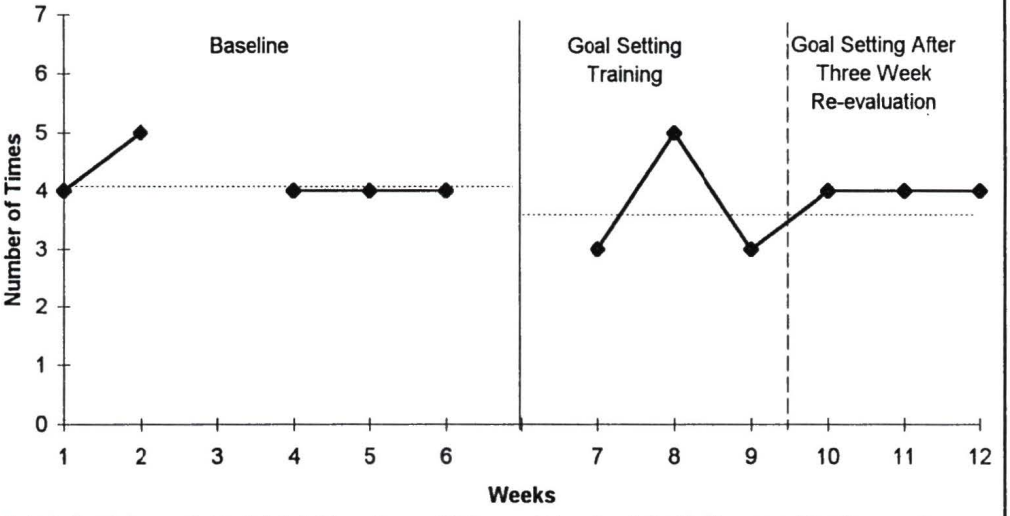

Figure 4c: Total (Inside and Outside) Number of Times Physical Activity was Performed.

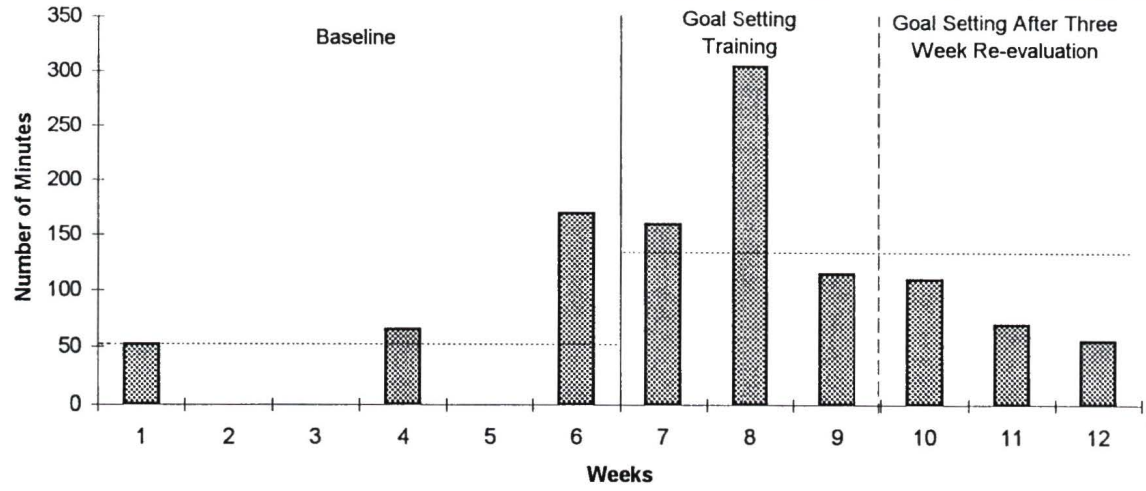

Figure 4d: Number of Minutes Devoted to Physical Activity at the Gym.

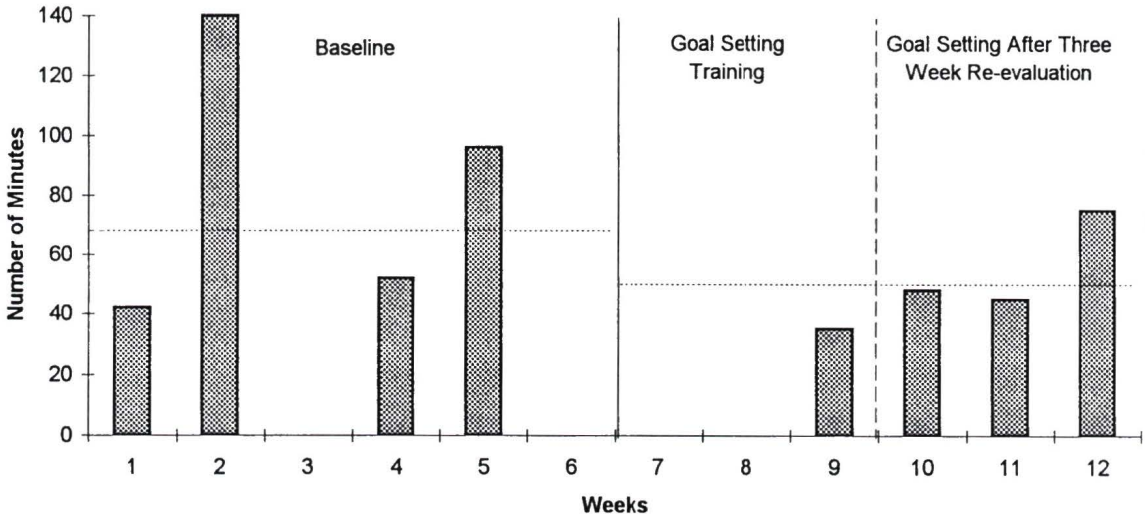

Figure 4e: Number of Minutes Devoted to Physical Activity Outside of the Gym.

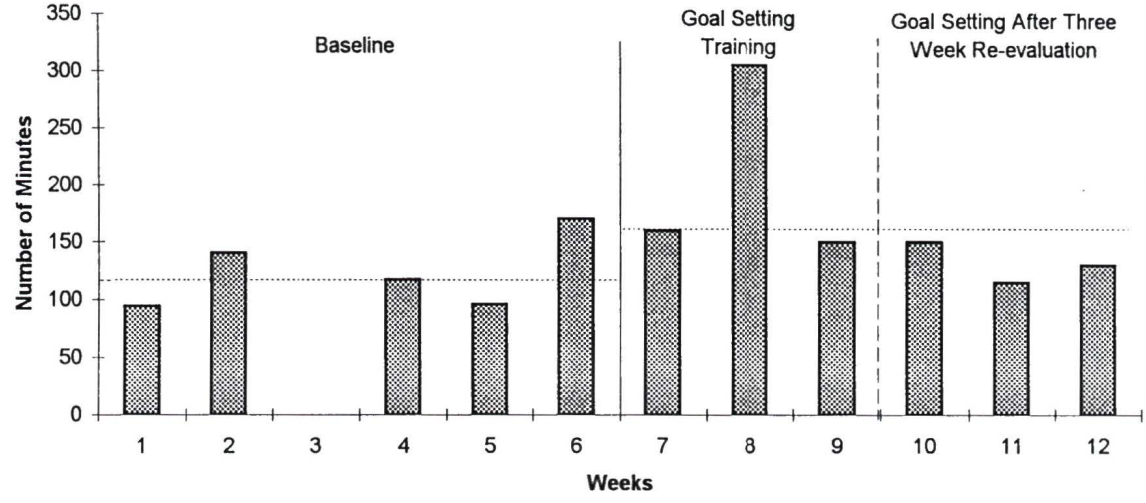

Figure 4f: Total Number of Minutes Devoted to Physical Activity.

4.5 SUBJECT SIX

4.5.1 Physical Activity Patterns at the Gym

The number of times the subject performed physical activity at the gym each week is shown in Figure 5 a. During the historical baseline phase, the subjected attended the gym six times per week. During the study baseline phase, physical activity was performed four times per week, the exceptions being weeks two and six when the subject was out of town for the first four days of each of these weeks. During the intervention phase, the number of times physical activity was performed was two or four times each week. At week eleven the subject reported that gym visits were not feasible due to family and work obligations. Overall, the number of times physical activity was performed decreased from baseline levels during the intervention phase.

The number of minutes devoted to physical activity each week is shown in Figure 5 d. During the baseline phase gym activity was performed for 270 minutes each week on a consistent basis, the two exceptions being at weeks two and six when the subject was out of town. During the intervention phase, the number of minutes devoted to physical activity remained the same as during baseline and decreased thereafter. Overall, the number of minutes devoted to physical activity at the gym decreased from the baseline to the intervention phase.

4.5.2 Outside Physical Activity Patterns

The number of times the subject performed physical activity outside of the gym is shown in Figure 5 b. During the baseline phase, physical activity was not performed for five out of six weeks. The exception was week two, when the subject went to an outdoor activity park for four days. During the intervention phase, outside activity was performed three out of six days. Overall, physical activity was performed more often during the intervention phase than during baseline, however, no consistent pattern of activity was evident.

The number of minutes devoted to outside physical activity each week is shown in Figure 5 e. During baseline, no time was devoted to outside physical activity with the exception of week two when the subject performed activity at an outdoor park. During the intervention phase, when activity was performed three times, the number of minutes ranged from 120 to 300. Overall, the number of minutes devoted to outside physical activity was greater during the intervention phase than during the baseline.

4.5.3 Total Physical Activity Patterns

The total number of times the subject performed physical activity (gym plus outside) is shown in Figure 5 c. During the baseline phase, activity was performed four times each week for five out of six weeks. During baseline, gym activity contributed the greatest number of times to the total, with the exception of week two. During the intervention phase, total physical activity alternated between three or four times each

week. Gym activity contributed the greatest amount to the total for four out of six weeks, and equally at week nine. Overall, total physical activity decreased from baseline levels, but a consistent pattern of activity was evident at both phases.

The total number of minutes devoted to physical activity each week is shown in Figure 5 f. During baseline, gym activity contributed the greatest amount to the total number of minutes. During the intervention, gym activity contributed the greatest amount to the total number of minutes for three out of six weeks. The number of minutes devoted to total outside physical activity was equal to or greater than the number of minutes devoted to gym activity for three out of six weeks. Overall, the total number of minutes devoted to physical activity did not change from the baseline to the intervention, however, time devoted to outside activity during the intervention did contribute more to the overall total than during baseline.

4.5.4 Types of Goals Set

The general or future goals set in order of importance were as follows:

1. To make physical activity a habit.
2. For health reasons; for the prevention of illness and disease.
3. To decrease stress.
4. To achieve a sense of well-being.

The short term goals set were as follows:

1. To exercise three or four times each week at the gym, choosing aerobic

dance as the mode of exercise, for a duration of 60 minutes per session.

2. To exercise at 75-80% of maximum heart rate when performing activities at the gym.

3. To incorporate extra stretching after at least one exercise session, one time per week.

There was no formal three week re-evaluation with this subject as she was not available. An informal conversation regarding the goals previously set revealed that she felt she was not always getting to the gym four times each week but was incorporating outside activity in as well. The subject indicated that when outside activities were performed she did not always feel that she was getting as much out of them as when she went to the gym.

4.5.5 Goals and Physical Activity Patterns

The physical activity patterns in the context of the goals set during the intervention phase were as follows.

The goal of exercising three or four times each week at the gym was met for weeks seven, eight and ten only. The subject said it was difficult to attend the gym at weeks eleven and twelve because she had family obligations. It is important to note that when total physical activity was examined, this goal was met for all six weeks of the intervention, however, the subject had indicated that she did not feel as if she had done as much physically when performing outside activities. Unfortunately, heart rates were not

reported for outside activities, although outside activities were performed for one or more hours at a time. Duration goals for gym activities were met or exceeded for all exercise sessions performed.

According to self-reported heart rates after the cardiovascular phase of an activity, the goal of exercising at 75-80% of maximum heart rate during gym activities was met for all six weeks of the intervention. During the baseline phase, reported intensities were at 65-70% of maximum, but then increased to a higher level for exercise sessions during the last week of baseline.

4.5.6 Post-Study Questionnaire and Telephone Follow-Up

A post-study questionnaire revealed that this subject did not use the goal setting strategies given to her during the study but that she had her own personal goals before joining the gym. She indicated that these goals were more useful to her than those goals set later as part of the study and that she was committed to these goals.

The subject felt that she had achieved her short term goals of exercising at moderate to high intensities (ie. she had increased her aerobic capacity). She felt she had achieved her long term goals of stress relief, making physical activity a habit and greater sense of well-being and control over life. Other goals not listed during the intervention but that she had set prior to the study which she felt she had attained were weight loss and a sense of better health. She indicated that she was unable to attain her goal of going to the gym between three and four times per week and did not feel she was obtaining the same

kind of workout when outside activities were substituted. She also felt she had not yet achieved her long term goal of prevention, but acknowledged this was ongoing and more difficult to measure and determine.

She indicated that she would informally use the goal setting strategies learned during the study. Other factors listed which helped motivate her were support from friends and family, a sense of accomplishment through awareness of her body's physical changes (ie. increased aerobic capacity, weight loss), her concern about her future health, and the friendly atmosphere of the gym. She also indicated that being a part of the study made her more aware of what she was doing in her physical activity program, however, at times she felt self-conscious if the researcher was present at the gym during her work out.

This subject engaged in a variety of aerobics classes, however the classes performed most often during the study were rate as either "very enjoyable" or "extremely enjoyable." Classes rated as somewhat enjoyable were not performed as often, with the subject indicating "when I learn the routines I will feel better." All outside activities were rated as "extremely enjoyable." Confidence in her ability to perform activities at the gym increased for all activities engaged in during the study from pre to post-study. The subject also indicated that significant others were very supportive of her desire to exercise regularly during the study. Self-reported barriers which inhibited the performance of physical activity were family and work obligations.

A six week telephone follow-up call revealed that the subject found it difficult to attend the gym in December due to family obligations. She said she was feeling good

now and had been going to the gym three times per week for the past three weeks. Overall she felt she was able to maintain her level of activity at the gym since the study ended. She indicated that her family medical history was and is a large factor in her motivation and commitment to her physical activity program. As a result she has made physical activity a priority in her life and wants to maintain this for health and stress reduction. She also indicated that prior to her children being old enough, it was more difficult for her to make physical activity (at a gym or club) a consistent part of her life.

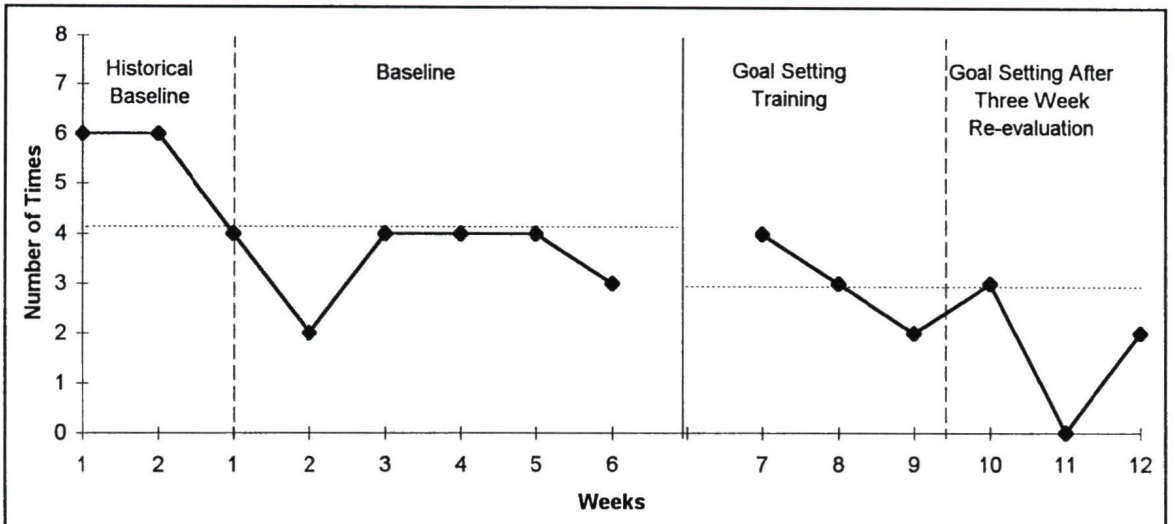

Figure 5a: Number of Times Physical Activity was Performed at the Gym.

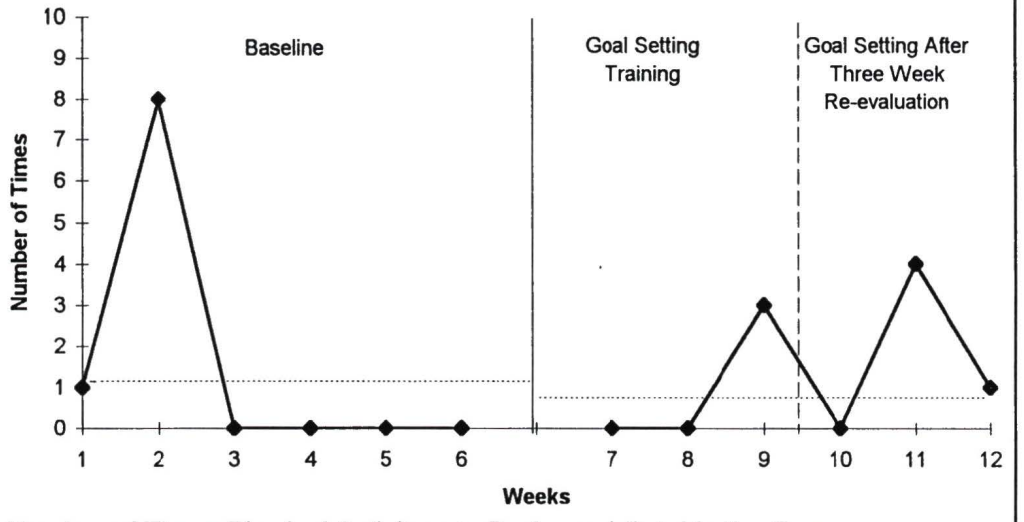

Figure 5b: Number of Times Physical Activity was Performed Outside the Gym.

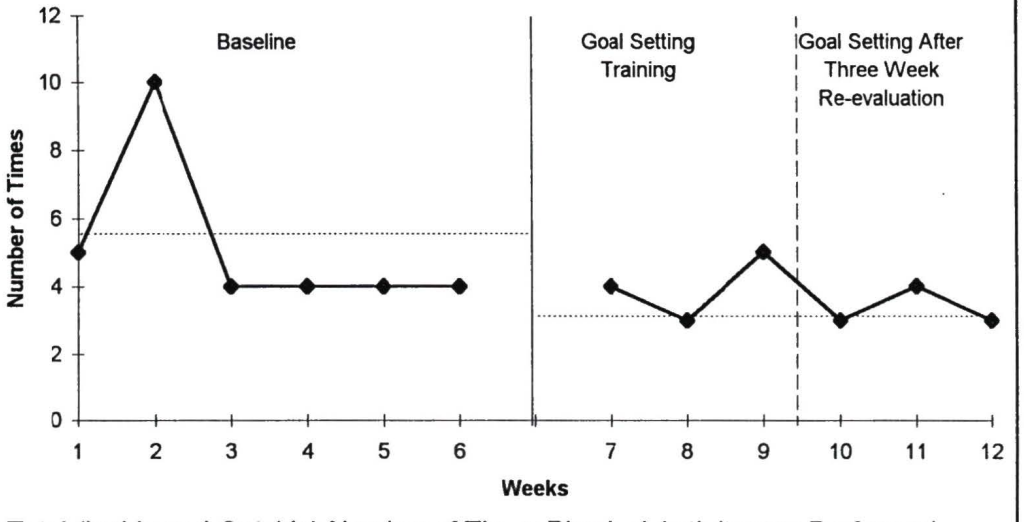

Figure 5c: Total (Inside and Outside) Number of Times Physical Activity was Performed.

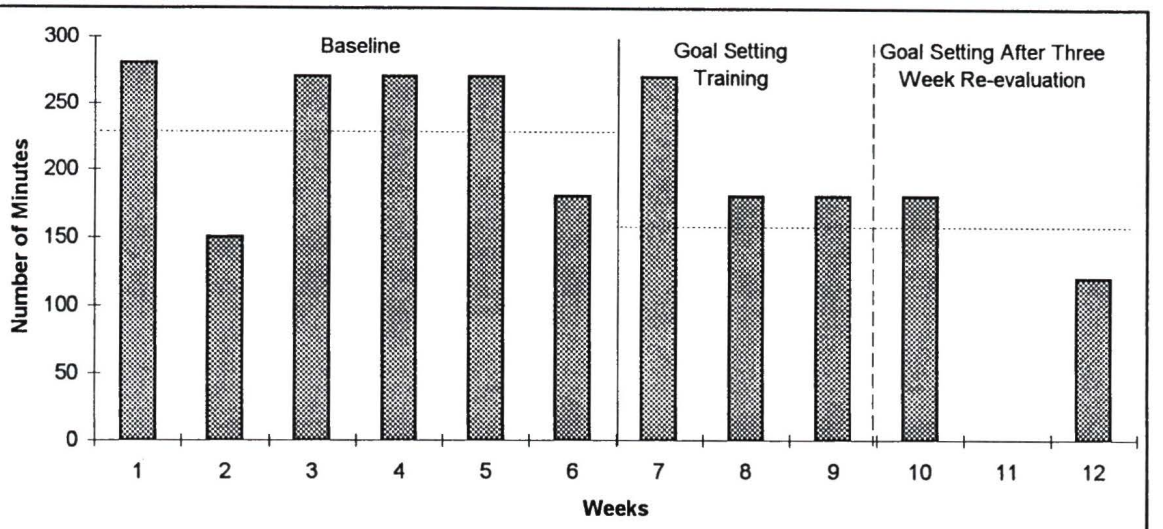

Figure 5d: Number of Minutes Devoted to Physical Activity at the Gym.

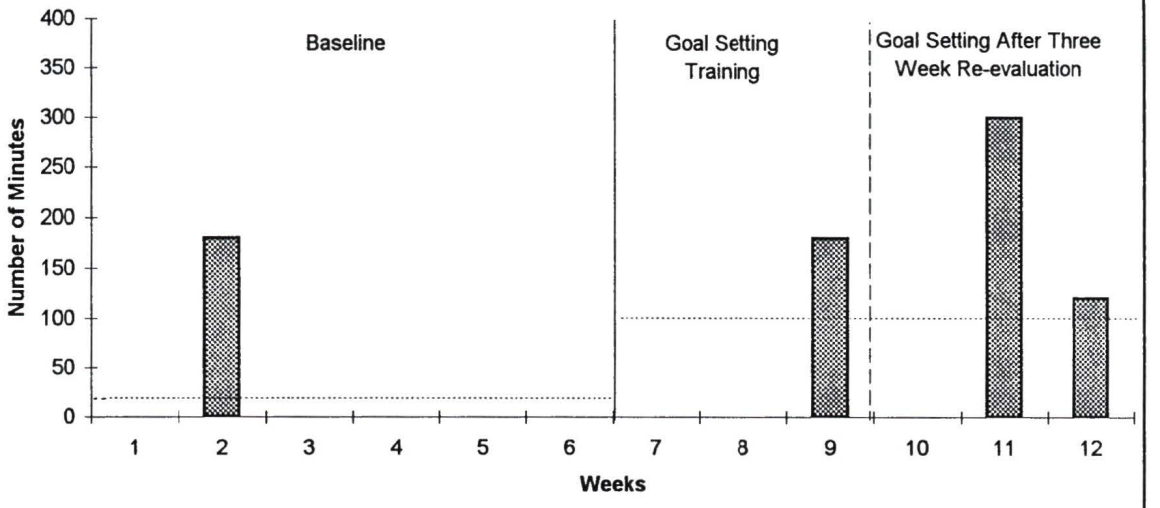

Figure 5e: Number of Minutes Devoted to Physical Activity Outside of the Gym.

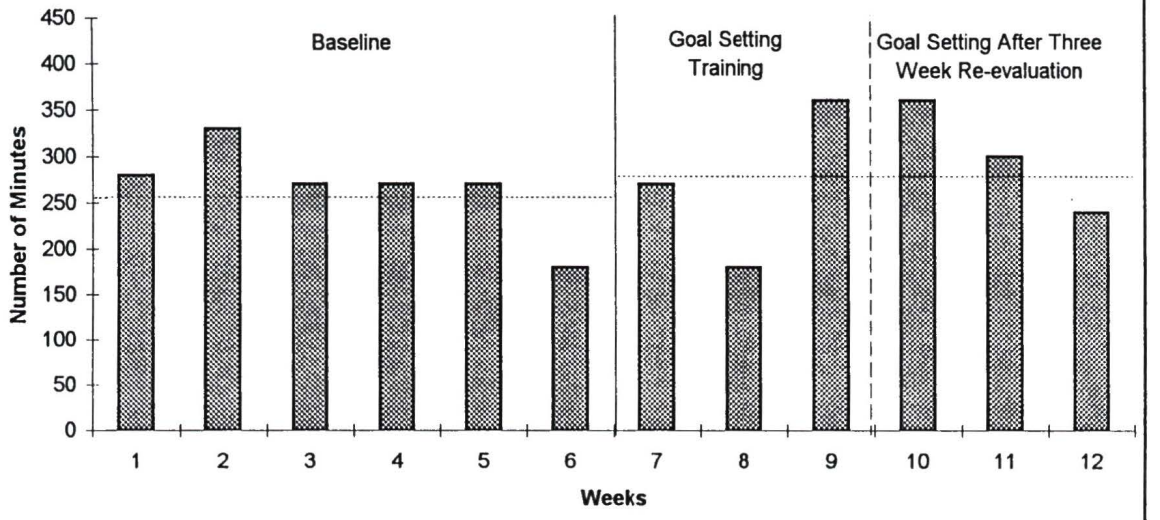

Figure 5f: Total Number of Minutes Devoted to Physical Activity.

Chapter V

DISCUSSION

The findings of the study will be discussed under the following headings:

1. The uses of goal commitment and adjustment.
2. The role of social support and self-efficacy.
3. The prevalence of barriers to physical activity.
4. The need for tailoring interventions to the individual and recognizing the individual's stage of readiness for approaching exercise.

5.1 GOAL COMMITMENT AND ADJUSTMENT

The use of goal setting strategies did not increase physical activity above baseline levels for the six subjects in this study. However, the use of such strategies did appear to provide five out of six individuals with some direction and motivation in their physical activity programs for the intervention period. Five out of the six individuals met their short term goals for the majority of weeks the intervention was in place. Little or no data was collected on subject two as she had become pregnant and was too ill to exercise for the 12 weeks of the study. Six weeks after the study, subjects one, three and six reported they were still exercising. Subject four reported little or no physical activity six weeks post-study, and subject five reported minimal activity. Therefore, the use of goal setting

strategies appeared to provide direction and motivation only during the intervention period.

When we observe an individual engaged in effortful behavior we can infer commitment. Locke and Latham (1985) indicated that it is important to be highly committed to one's goals, particularly when the goals are difficult. This relates to the amount of effort an individual is prepared to expend when trying to achieve a goal. According to Locke and Latham (1985) "Assuming the goal is accepted, effort is exerted in proportion to its difficulty. The harder the goal, the greater the effort expended" (pg. 207). For example, four out of five subjects had indicated that a goal they wanted to attain in the future was to make exercise and physical activity a consistent habit and part of their lifestyle. The fifth subject did not state this goal directly, but implied it indirectly by setting a short term goal of exercising one or two times each week in order to feel better emotionally and physically and lose weight and body fat. In the context of all five of these individuals past exercise histories, this goal could have been viewed as difficult and challenging. As a result, more effort would have to be expended in order to attain the goal. From a high expenditure of effort, commitment could then be inferred.

Locke and Latham (1985) have also suggested that goal commitment can be affected by asking the individual to accept the goal, showing support for the goal, allowing participation in the setting of the goal(s), and incentives and rewards. The successful effects of support and participation of the individual in the goal setting process were illustrated in five out of six of Martin et al.'s (1984) goal setting studies. For example,

studies one through three found personalized feedback and flexible, participant-set goals to yield superior adherence to a jogging regimen. In study five, it was found flexible, participant-set goals and personal feedback combined with cognitive dissociation strategies yielded superior adherence. The sixth study showed that there were no differences observed across maintenance between groups who received relapse prevention along with flexible goals. Interestingly, four out of six individuals in a group who received no relapse prevention and were exercising at maintenance, continued to arrange meetings with their course assistant after the study had ended. Additionally, several members of the relapse prevention group had formed a social network and continued to run with one another (Martin et al., 1984). The importance of social support will be specifically discussed later, but it is possible that usage of it along with flexible participant goals may have served to increase the amount of effort expended for those individuals who adhered to their exercise regimens in the Martin et al. (1984) studies. Three out of five subjects in the current study indicated they had support from significant others for their goals. Subject five indicated in her post-study questionnaire that significant others were only somewhat supportive and subject one had indicated that significant others were neither supportive nor unsupportive. It is possible that because of her more frequent gym visits, subject one found the atmosphere of the gym supportive or that she was experiencing the physical and psychological rewards of exercise, as had the subjects in Keefe and Blumenthal's (1980) study or the subject in Kau and Fischer's (1974) study. As mentioned earlier, rewards and incentives are also necessary for goal commitment, and given that subjects four and five

were not exercising frequently or consistently enough, they may not have experienced some of the natural reinforcers present with regular physical activity. This would have resulted in their level of energy expenditure or commitment toward the goal (s) being lower, and necessarily fewer goals would have been attained. For example, subject four described her lack of effort in the post-study questionnaire as a barrier to exercise which was a "lack of motivation".

In addition to goal commitment being a factor, the importance of goal adjustment or goal modification may also have been a factor. Locke (1968) and Locke and Latham (1985) have asserted that difficult or challenging goals produce better performance than moderate or easy goals, providing the individual has the ability. Weinberg et al. (1990) challenged this notion when they concluded from their lack of significant results regarding goal difficulty and positive reinforcement on an endurance task that difficult goals may be motivating for some individuals but not for others, and that unrealistically high goals do not necessarily result in decreased performance for all individuals. However, in that study it did not appear that subjects tried hard "even in the face of failure" and that there were no performance differences between realistic and unrealistic goal conditions as Weinberg et al. (1990) suggested. Instead, it may have been those individuals in the unrealistically high goal setting group appeared to realize that the goal was not realistic and lowered it or adjusted it to a more realistic level which was a better reflection of their ability.

All of the subjects in the current study experienced barriers such as illness, injury or family obligations. These will be discussed in detail later, however, it was likely that

barriers temporarily disrupted originally set general and short term goals, perhaps altering the individual's ability to attain them. When a goal is no longer feasible, it seems reasonable that it would be perceived as being too difficult. As a result, the amount of effort expended to achieve it would have decreased unless the goal were lowered to an acceptable level. For example, subject five indicated during the intervention period that gym visits were not a high priority because she was opening her own business. The researcher suggested that this goal be modified temporarily and that she substitute outside physical activity instead. For those weeks, outside physical activity was performed more frequently than gym activity and then decreased when gym visits were again "feasible." Similar suggested goal modifications occurred for subject one when it was suggested she substitute outside physical activity when gym visits were not convenient. Subject three also adjusted her goal to substituting lower level activity due to illness and injury during weeks eight through ten, and then was able to modify the goal and return to the original goal when she had recovered.

Burton (1989) illustrated through two case studies (both female), how performance goals of swimmers can have both positive results when they are realistic and negative results when they are not. Burton used a goal setting training package to help university athletes learn goal setting skills. Case one "believed" in the goal setting training program and was highly committed to practising goal setting skills. Her results demonstrated that as her goals became more accurate, there was a reduction in both cognitive and affective components of stress. Further, her swimming performance was also

enhanced. Case two, despite a strong performance orientation, frequently had unrealistic goals for her current capabilities. An illustration of this was when an illness reduced her performance capabilities for the biggest competition of the season and she failed to lower goals accordingly. As a result, not only was an inaccurate goal set for her specialty, but performance decreased as well. The reasons suggested by Burton (1989) for this impaired performance were attributed to the fact that as this individual's expectation of success decreased, cognitive anxiety increased. Further, the ability to concentrate and the amount of effort she showed also decreased and resulted in being a detrimental performance (Burton, 1989). Interestingly, it was suggested that although the subject cognitively knew what to do, when the situation became highly stressful, the goal setting skills were not used in an effective way.

In view of Burton's (1989) findings, it is speculated that subjects four and five in the present study did not lower their expectations and goals when the study terminated and barriers accompanying the holiday period (ie. social and family obligations, bad weather) made performing physical activity difficult. As a result, although they knew they should re-evaluate and modify their goals, they may not have. Instead, the goal to perform activity was abandoned altogether. Conversely, subjects one, three and six may have made their goals more realistic when holiday period barriers were present and were able to resume activity once the barriers were gone.

5.2 SOCIAL SUPPORT AND SELF-EFFICACY

The role and importance of social support in exercise and physical activity programs has been well documented (King et. al, 1988; Martin et al., 1984; Noland, 1989; Turner et al., 1976; Wankel et al., 1985). As previously discussed, having social support for one's goals is necessary for goal commitment (Locke & Latham, 1985). However, social support may serve as a motivator independent of the goals set by the individual. This can be illustrated by King et al.'s (1988) study which found a group of individuals who had recently adopted a home-based exercise program and received monthly telephone calls offering support and guidance had superior self-reported adherence at the end of the study over those individuals who did not receive any telephone calls. Similarly, Wankel et al. (1985) also found a social support program facilitated attendance in an aerobic dance class, with no effect due to self motivation level as measured by a self motivation inventory. Participants also indicated that leader support, buddy support and general class support were the most important factors in the program to them.

Although the previously mentioned studies cannot be directly compared to the present study due to varying procedures and subject populations, there are certain common elements present which provide insight to behaviors . The results of this study were in accordance with the literature that supported the utility of social support in exercise and physical activity programs. When a post-study questionnaire was administered to the subjects in this study, three out of five subjects indicated that significant others were extremely supportive of their desire to perform physical activity

throughout the study, while subject one indicated this was neutral, and subject five indicated significant others were not very supportive. Four out of the five subjects also indicated the fact that they were accountable to the researcher was not only a perceived facilitator of short term goals, but also made them more inclined to go to the gym. The fifth subject indicated that she found being accountable to the researcher "motivated" her to attend the gym, but only "at times" during the study. Comparing this to goal attainment during the intervention period of the study, results seem to suggest that those individuals with a social support system of some kind attained the majority of their goals during the intervention period and resumed physical activity participation after the study had terminated (with the exception of subject four).

Other factors listed by subjects which helped them to perform physical activity more often in the study also exemplified the importance of social support. These included " the supportive atmosphere of the gym" and the instructor/leader of a fitness class. As mentioned, Martin et. al (1984) demonstrated in a series of their studies the importance of the fitness leader or instructor of a program as being an important factor affecting adherence. Wankel (1985) has also suggested that no matter which intervention approach participants are given, the program leader likely has a role in its success.

The successful attainment of goals are also thought to increase levels of self-confidence or self-efficacy. More specifically, efficacy cognitions are representative of a person's belief in their capabilities for successfully meeting the demands of a specific task (Bandura, 1977). Further, efficacy cognitions may influence the type of activities, the

effort in performing those activities, and the amount of persistence in the face of barriers (McAuley & Jacobson, 1991). In this way, the setting and achievement of goals in one's physical activity program should result in the individual achieving some level of mastery and should then persist at a particular task(s) with greater effort. This assumption was supported by Howe and Poole (1992) who found male high school students generally selected short term goals over long term ones, possibly for self-satisfaction and success at the attainment of long term goals, sustaining effort/persistence as a result.

Self-efficacy as a predictor of physical activity participation and drop out has been supported by research in a variety of settings (McAuley, 1992; McAuley & Jacobson, 1991; Sallis et al., 1986). In accordance with the above research findings, self-efficacy may have increased as a result of goal achievement and decreased when goals were not achieved. When subjects completed a post-study questionnaire regarding their perceptions of their confidence in their ability to perform physical activities at the gym before the study and after the study, self-confidence levels had increased for three out five subjects for all activities engaged in at the gym. These same subjects also met the majority of their goals during the intervention period and reported they had resumed physical activity after the study had terminated. Subject four reported that self-confidence levels had remained the same for gym activities, with the exception of weight training which increased (this goal was met three out of six weeks of the intervention phase). Subject five reported increased confidence in her ability to perform physical activities at the gym for all activities, however, the reported confidence level on lifting weights decreased from pre to post-

study. Interestingly, this goal was not met during the intervention phase for this individual which may have been a clear example of non-achieving goals reducing self-efficacy for that particular task. Additionally, neither subject four or five reported they were performing physical activity on a regular or consistent basis after the study had ended.

These results may be a function of what Burton (1989) had suggested in his study; that when goals are not realistic and modified as necessary, the individual may have decreased self-confidence and the amount of effort may also decrease. Martin et al. (1984) suggested a similar reason for subjects in their fourth study who set less-frequent goals and had superior adherence to exercise over those individuals who set more frequent goals. It was proposed that less-frequent goals may have allowed for more flexibility in performance. As a result, having fewer goals allowed subjects to progress slowly, without frequent goal deadlines reminding them they were failing.

Another reason may relate to Locke and Latham's (1985) recommendation that goals be kept realistic. When goals are not realistic (ie. are too difficult), individuals will fail to take them seriously. This in turn would affect the amount of effort expended or acceptance of the goal (s). It is possible that goals were too difficult (ie. not realistic) and as a result subjects did not increase their physical activity above baseline.

Factors listed by subjects which helped them to perform physical activity more often identified by subjects one and six may also illustrate that their self-confidence was increasing because of exercise and the attainment of goals. For example, subject one indicated that the feeling of being "in shape" helped her to exercise more frequently, and

subject six wrote that she had "a sense of accomplishment through awareness of my body's physical changes," such as increased aerobic capacity, and weight loss.

Finally, all subjects tended to engage more frequently in those activities they found the most enjoyable during the study, performing less enjoyed activities less frequently. While this assertion may seem obvious, the relationship between what people enjoy and what people do may not be a perfect one. For example, people may seek out activities for contingencies other than intrinsic pleasure (ie. weight loss, social interaction, to please others). This may be especially true for women, who seek subjective experiences. The subjects in the current study may have been seeking activities which allowed them to exemplify some level of mastery or competence. For example, subject six rated certain specific aerobic classes as only "somewhat enjoyable" and performed those particular classes less often during the study, indicating "when I learn the routines I will feel better."

5.3 PREVALENCE OF BARRIERS

As already acknowledged, goals set during the intervention phases of the study for each subject had to be modified as a result of barriers to exercise. The presence of specific barriers such as illness, injury, bad weather, and family, work and social obligations made the establishment of a pattern of regular physical activity difficult for all six individuals. More specifically, subject one was ill during weeks eight and nine of the study; subject two had little or no data collected as she became pregnant and was too ill to perform any physical activity for the entire twelve weeks; subject three was ill at week

eight and then injured her back at week ten as a result of falling down the stairs at home; subject four reported a back injury at week three and was ill for three days at week five; subject five reported not being able to attend the gym due to starting her own home business; and subject six reported difficulty attending the gym at weeks eleven and twelve due to family obligations.

Research reviews by Martin and Dubbert (1982) and Dishman (1982) have suggested that barriers such as lack of time are a principal self-reported reason for dropping out of community and clinical programs, but believed that this could reflect a lack of commitment (as inferred by the amount of effort expended) or interest in physical activity rather than actual time constraints. Wysocki et al. (1979) reported that four individuals dropped out of their adherence study during the baseline phase, with three of four subjects indicating there were time limitations and therefore they could not exercise.

While it is possible that the time constraints mentioned by the participants in the current study reflected a lack of effort or commitment, this was unlikely. It has been suggested that women may experience unique "gender role-imposed" expectations which may mean that time is constrained because women and girls may be involved with family duties. As a result, they may not have time for leisure (Henderson & Bialeschki, 1991). Women may also perceive that work and home come before leisure time (Henderson & Bialeschki, 1991). Subjects one and six (who mentioned family obligations as being a barrier to physical activity throughout the study) were both single parents. The same may be said for the other two subjects who also had children; subject three was home schooling

her three young children, and subject five was running a day care out of her home in addition to looking after her children. Further, the substitution of outside physical activity would have been difficult for all subjects during November, when the weather was poor.

These results appear to be consistent with other studies which have had reduced adherence to or drop out from exercise programs. For example, Martin et al.'s (1984) first study on goal setting and personal feedback found that for those individuals who had not maintained their program after the study had ended, 71% cited inclement (winter) weather and 33% cited loss of their exercise partner. In the fifth study by Martin et al. (1984), a six month follow-up of individuals who received either associative or dissociative cognitive strategies to use while exercising revealed that three of the original subjects (two dissociative and one associative) were unable to exercise because of health problems (ie. pregnancy, plantar warts) or injuries sustained in other activities (ie. softball). Establishing or maintaining an exercise habit or making physical activity a consistent part of one's lifestyle is difficult when barriers prevent an individual from establishing a consistent pattern of physical activity.

5.4 STAGE OF READINESS TO EXERCISE

At the outset of this study, based on participants self-reports of past exercise behavior and physical activity history, it was established all six individuals were currently preparing to make or were making small changes where their exercise and physical activity behavior was concerned. Based on this assumption, what could be termed an "action

oriented" intervention strategy was employed in order to provide these individuals with some motivation and direction in their physical activity programs. While it can be said that the use of goal setting strategies provided five out of six individuals with some direction and motivation in the short term, like most intervention studies the long term effect of such strategies for maintaining exercise behavior were uncertain. In view of these results, the importance of tailoring the intervention to the individual and recognizing/measuring what stage of readiness for approaching exercise they were at throughout the study became evident.

As mentioned in Chapter II, one of the most promising theoretical models which considers the individual critically has been the Transtheoretical Model of Behavior Change (Prochaska, DiClimente & Norcross, 1992). This dynamic model has suggested that the success of treatments and interventions to modify behavior (s) may be a function of the stage of readiness to change of an individual.

In this study, subjects four and five may not have been at the preparation stage of change, or if they were initially they regressed to the contemplation stage. This would mean these individuals were aware that a problem existed and wanted to overcome it, but had not yet acted (Prochaska et al., 1992). This suggestion could be illustrated by subject five's indication on the post-study questionnaire that she was not committed to her goals. Additionally, subject four indicated during the telephone follow-up that she knew she should exercise more, but had not since the study terminated. Subject five indicated that she had not attended the gym in the past five weeks, but had begun attending the gym in

the past week again. If the stage of readiness to exercise had been measured throughout the study, it might have been possible to tailor the intervention to the individual instead of the other way around. While the goal setting intervention did attempt to teach individuals how to modify and lower goals if necessary, other techniques may have been more successful. For example, consciousness raising techniques such as increasing information about oneself and the problem and becoming aware of the feelings about oneself with respect to physical activity could have been used. This would have made individuals more aware of their own behavior and the problem, and possibly barriers, therefore goals may have been more realistic (Prochaska et al., 1992).

A recent study by Gorely and Gordon (1995) supported the idea that different constructs are either more or less important depending on where in the change cycle the individual is. One of these constructs is called processes of change. Processes of change are activities which individuals use to modify their environment in order to modify their behavior (Marcus & Simkin, 1994). Evidence cited by Gorely and Gordon (1995) has suggested that each process of change is emphasized to a greater or lesser extent depending on the stage of change. Results of their study provided support for this, finding that individuals at the "precontemplative" stage tended to use processes of change less than individuals in all other stages. As individuals at the contemplation stage progressed to the preparation stage, they generally used more behavioral processes. The usage of these processes increased again as individuals moved from the preparation to the action stage. An associated increase in the use of stimulus control processes (ie. an increase in behavior

that reminded an individual to exercise) with increased activity from the preparation to the maintenance stage of change was also found to be of importance.

It is also possible the remaining three individuals in the current study who reported continuing to engage in physical activity since the study had terminated may also have progressed or regressed into another stage of change over the twelve weeks of the study. Unfortunately, the stage of readiness for exercise was not measured for any of the individuals in this study.

5.5 CONCLUSIONS

Based upon the original research questions, the following conclusions could be made.

1. There was no increase in the amount of physical activity performed at the gym or outside of the gym over a 12 week period for six females who had recently begun a physical activity program and given training and guidance in goal setting strategies. This was not consistent with other studies (Kau & Fischer, 1974; Keefe & Blumenthal, 1980; Martin et al., 1984; Turner et al., 1976) which found the use of goal setting strategies to enhance physical activity participation in a variety of settings.

2. The use of goal setting strategies did provide temporary direction and motivation in a physical activity regimen for five out six individuals. This was in accordance with studies which have suggested the short lived success of

interventions, but not in the long term maintenance of exercise behavior (Martin et al., 1984). It was not in accordance with other goal setting studies which found longer term effects for individuals (Kau & Fischer, 1974; Keefe & Blumenthal, 1980; Turner et al., 1976).

3. Beginning female exercise participants had similar general goals with respect to their exercise and physical activity programs. These included to make physical activity a consistent part of one's lifestyle; to lose weight; to increase energy; to feel better emotionally and physically; and to learn how to lift weights. Short term goals were more individualized and varied according to the subjects' activity preferences, lifestyle, and self-reported fitness level.

4. Being committed to goals (as inferred from the amount of effort expended) and adjusting or modifying goals when necessary appeared to be an important factor in the attainment of goals. This was in accordance with Locke and Latham's (1985) view, and with field studies (Burton, 1989; Martin et al., 1984).

5. Social support appeared to be an important factor in both the amount of effort expended in relation to goals and in the attainment of goals. Social support was also an adherence factor in and of itself for five out of the six subjects.

6. Self-efficacy was inferred to be an important correlate to the attainment of goals and participation in physical activities.

7. All subjects reported that barriers such as illness, injury, bad weather, and family, work and social obligations made the establishment of a pattern of regular

physical activity difficult. With female subjects of this age group, it is reasonable to conclude these were real rather than perceived barriers.

8. It was proposed that interventions should be tailored to the individual and the stage of readiness for approaching exercise should be recognized.

9. Programmers and practitioners should be made aware of the factors (ie. social support, barriers, self-efficacy, stage of readiness to exercise) which may influence adoption and maintenance of exercise and physical activity. This would be of importance to ensure the program meets the needs of the individual, not the other way around.

5.6 FUTURE RESEARCH RECOMMENDATIONS

The following are recommendations for future research based on the results and discussion.

1. Studies should continue to use multiple measures of adherence in order to provide a true and accurate picture of what constitutes an "exerciser." As Martin et al. (1984) have suggested, exercise should not be viewed as a dichotomy which classifies individuals as either exercisers or non-exercisers. Using multiple measures of adherence may help to clarify and possibly alter the current definitions of an "exerciser" and a "drop out," and be in accordance with the current movement toward active living rather than prescribed exercise routines.

2. Future studies might benefit from precisely measuring which stage of

readiness to exercise individuals are at so that the appropriate interventions can be developed and then tested. These stages should be also be measured throughout the exercise process (ie. adoption, maintenance) so that intervention techniques may be adjusted to the individual if necessary.

3. More studies on goal setting and exercise and studies on exercise adherence are needed which consider the individual and their context. Examining individuals rather than groups can yield information which often can be missed or undetected in group research. A suggestion would be for future studies to employ a changing criterion single subject design. This particular design allows for a criterion to be set and then increased as subjects are meeting it. The implications of this for beginner exercise participants are that exercise behavior could be shaped gradually, establishing both a pattern and possibly the habit of exercise. At the same time, how much experimental control an intervention has on behavior may also be more readily demonstrated.

4. The barriers (perceived or actual) to exercise and physical activity that may exist for both males and females must be further explored. Additionally, more long-term studies comparing males and females and the barriers each group may or may not face should be done in order to assess whether or not these barriers change over time or if the barriers remain, but coping strategies develop. This should be examined as individuals start to become more consistent with their physical activity participation.

5. Future studies should attempt to measure the impact of social support on the setting and attainment of goals in physical activity settings.

6. Self-efficacy as a function of goal attainment or non-attainment should be explored further in order to see if self-efficacy changes across the exercise/physical activity process as goals are attained or not attained.

7. More studies are needed to examine the impact of goal setting on adherence to physical activity in real-world exercise settings (ie. recreation facilities, outdoor recreation clubs, clinical settings) with various populations (ie. the elderly, children, males, the obese) to see the effects on physical activity participation. For example, a qualitative exploration which follows goal setting in its natural setting may yield interesting results.

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APPENDIX A

BEGINNING AN EXERCISE PROGRAM

The American College of Sports Medicine (1990) suggests the following guidelines when undertaking cardiorespiratory exercise programs for healthy adults.

1. MODE

Select rhythmical aerobic activities which can be maintained continuously and involve large muscle groups (ie. walking, jogging, running, hiking, swimming, skating, cycling, rowing, rope skipping, and other endurance games and activities).

2. INTENSITY

Exercise intensities should be between 55% and 90% of maximum heart rate (see "Finding Your Target Heart Rate").

To improve cardiorespiratory endurance, exercise intensity must be sufficient to stress the cardiovascular system without overtaxing it. Moderate exercise (55-75% of maximum heart rate) is recommended for individuals beginning an exercise program.

3. FREQUENCY

Frequency of exercise depends in part on the health and fitness level of the individual. Normal, sedentary individuals should exercise a minimum of 3 times a week to produce significant changes in cardiorespiratory endurance. It is wise to exercise on alternate days during the initial stages of training to lessen the chance of bone or joint injury.

4. DURATION

Intensity and duration of exercise are inversely related (the higher the exercise intensity, the shorter the duration of the exercise). Select an initial exercise intensity that can be sustained for a minimum of 15 minutes, but preferably for 20-30 minutes. After 2 weeks of training, the duration of exercise can be increased to 45 minutes. Within 1 hour after an

exercise session, you should feel rested, not fatigued. DO NOT DO TOO MUCH TOO SOON!!!

5. ADAPTATION AND THE CEILING EFFECT

Adaptation refers to the fact that the body will respond to the type and amount of physical demands placed upon it. When beginning an exercise program, the first time you exercise, it may feel very difficult and taxing. However, as you stick to exercising, what was once uncomfortable, may start to be unchallenging. This means your body has adapted to what it has been doing. What was once new is now "old hat". This is why you must start to increase the overload (see number 6).

While the body will continue to adapt in small ways to increasingly strenuous levels of exercise, individuals will not continue to improve their fitness level indefinitely. Everyone has a ceiling which is partly determined by heredity. In addition to this absolute limit, it will also be found that with each overload increase, the amount of improvement will be less until at last, an increase in overload will produce no significant increase in fitness level.

6. RATE OF PROGRESSION

Physiological changes associated with aerobic endurance training enable individuals to increase the total work performed. The greatest conditioning effects are observed during the first 6-8 weeks. Aerobic endurance may improve as much as 3% per week for the first month, 2% per week for the second month, and 1% a week thereafter.

In order to make continued improvements, the cardiorespiratory system must be overloaded by adjusting the intensity and duration of the exercise to the new level of fitness. The system must be required to perform at a higher level than what it is normally used to. Rate of improvement depends on age, health status, and initial fitness level. Individuals who are more fit and closer to their genetic limitations will not improve as much as those less fit.

7. USE AND DISUSE

After one stops exercising, the training effect or physiological gains will be lost at

about one-third the rate at which it was gained. The exact rate varies with the type of tissue. Aerobic capactities are lost much quicker, strength is lost somewhat slower. Basically, use promotes function and disuse promotes deterioration. It applies to the body as whole, or to its parts. In other words, fitness is a way of life, it's not something that's undertaken only when you realize you are unfit. Once you stop exercising, your muscles will begin to atrophy, your resting heart beat increases, and the ability of your muscles is lessened.

8. THE IMPORTANCE OF REST

The benefits of exercise to the body are well-known. However, a common mistake many individuals make is thinking that if a little exercise is good for you, then a lot of exercise will be even better. When you are exercising at moderate intensities, you are taxing your system. During a training session, there are certain tissues which are broken down due to the action of the exercise. The training effect of exercise comes about when these tissues are replaced to a level higher than before. So, during exercise, the level of tissue building is actually reduced and the physical benefits of exercise can only occur when the body is rested for a period of time afterwards. The average time is usually 24 to 36 hours.

CARDIOVASCUALR - RESPIRATORY ENDURANCE

"Cardio" refers to the heart, "vascular" refers to the blood vessels and "respiratory" refers to the lungs. Endurance is the length of time that a person can continue relatively heavy work.

Cardiovascular respiratory endurance means: the ability of the lungs to take oxygen into the body and the ability of the heart to pump oxygen through the blood vessels to working muscle cells. Cardiovascular fitness is often referred to as "aerobics" which literally means "in the presence of oxygen". Prolonged use of large muscle groups stresses the ability of the cardiovascular-respiratory system to use oxygen. During vigorous physical acitivity, the demand for oxygen and nutrients by the working muscles may increase 15 to 20 times over resting states. The more oxygen the system can deliver and actually use, the longer the person will be able to exercise before fatiguing.

ADAPTATIONS TO TRAINING

Physiological changes will result in systems which are trained. As mentioned, body systems adapt to particular patterns of use or disuse. For example, if only normal daily activites are performed over a long period of time, the body will adapt to the level of these demands. On the other hand, if an individual attends a fitness class three times per week, within a few weeks their body will have adapted to a higher level of activity. A person's physical condition is not stable but instead changes according to the specific adaptation of the body to the everyday demands placed on it.

ESSENTIALS OF A CARDIORESPIRATORY EXERCISE WORKOUT

Prior to activity it is important for the body to be primed and properly hydrated, fuelled, warmed up, and stretched in order to be ready to perform. Each exercise session should include the following phases:

WARM-UP

The purpose of the warm-up is to increase blood flow to the working cardiac and skeletal muscles, increase body temperature, decrease chance of muscle and joint injury, and lessen the chance of abnormal heart rhythms.

During the warm-up, the tempo of exercise is gradually increased to prepare the body for a higher intensity of exercise. The warm-up lasts approximately 10 minutes and includes stretching exercises and light calisthenics. The warm-up period should be longer if conditions are colder or if individuals are older or less fit.

CONDITIONING PHASE

This phase usually lasts 20-60 minutes. Here the intensity is greater than in the warm-up phase (approximately 55-75% of maximum heart rate).

COOL-DOWN PHASE

The purpose of a cool down is to facilitate venous return of blood to the heart and to bring the heart rate down slowly from training values. One's heart rate at the end of a cool down should be within 20 beats per minute of lower limit target values. The cool down needs to be longer in length for warmer temperatures, older people, more intense workouts, and less fit people. Continue exercising (walking, jogging, dancing, cycling) at a

low intensity. This light activity prevents pooling of blood in the extremities and reduces the possibility of dizziness and fainting. The continued pumping action of the muscles increases the venous return and speeds up the recovery process of the heart rate. Stretching exercises should be repeated to reduce the chance of muscle cramps or severe muscle soreness.

STRETCHING AND FLEXIBILITY

Stretching is probably the single most important activity that can be used to prevent injuries. Stretching before and after each workout increases flexibility.

Flexibility is the ability to move muscles, joints and bones through their full range of motion (ROM). Improving ROM can improve performance.

The way to achieve flexibility is to follow basic principles of exercise science. Stretching to the point of pain activates two different types of nerve-fibre receptors: Golgi tendon organs (GTOs), located in the tendons, and muscle spindles, located in the muscles. The GTOs and muscle spindles protect the muscles and tendons from damage. If you stretch too aggressively, these receptors will actually decrease flexibility to protect the muscles from damage.

The way to stretch correctly is to avoid the pain threshold. Get into a position where the target muscle feels tight but still comfortable and hold for 10-15 seconds, then release the stretch. After a few seconds, resume the stretch but focus on a greater relaxation of the muscle group and hold for 20-30 seconds, feeling the muscle loosen up. Breath slowly and deeply at all times -never hold your breath. This format of 2-3 brief stretches is usually enough for both warm-up and cool-down.

NEVER STRETCH COLD MUSCLES!!! Muscles must be thoroughly warmed up before you begin the stretching routine. Muscles are like rubber bands. If the rubber band is cold, it won't stretch very far before it breaks. Once it's warmed up, however, it will stretch further and more efficiently. So if you only stretch one time, the better time is at the **end** of your workout. Post-workout stretching minimizes spasms, promotes relaxation of the muscles (and mind and nervous system) and speeds recovery by alleviating or minimizing the stiffness and soreness of workouts.

Stretching Techniques

There are five basic stretching techniques, however, only four will be discussed. In **active stretching**, you supply the force of the stretch. In **passive stretching**, a partner or a device provides the force. Most likely, you will be doing active stretching.

Static stretching is the most popular and recommended technique for a beginner and recreational exerciser. It involves moving into a comfortable stretch and holding the position for the desired time.

Ballistic stretching involves momentum in the form of bouncing, bobbing and rapid stretching movements. This technique has the highest degree of risk and should be done only by well-conditioned athletes who require ballistic movements in their activities such as martial arts, ballet and gymnastics.

SAFETY TIPS

Footwear

The first, and most important purchase for the person who wants to become more active, are shoes. Some suggestions for buying shoes are:

- stay away from gimmicks, such as trendy sole designs, or unusual materials. They may look good, but their performance may not measure up to your needs.
- buy shoes in the afternoon when feet are most swollen.
- consider weight! Different shoes will perform better for individuals in a particular weight range.
- try and buy shoes from a reputable store which has staff and sales people who are trained to know what will be the best shoe for your feet and your chosen mode of exercise.

Fluid Balance

Sweating during exercise results in loss of body water. Excessive losses can lead to dehydration and a decrease in blood volume. Generally, drinking water is the best way to replenish fluids. Try and drink about 3 cups of water 30 minutes before you exercise. During a class, take small frequent drinks, and after exercise take small frequent drinks.

Self-Monitoring

Monitoring pulse rate and the Heart Rate Target Zone lets you know how hard you are working during an aerobic activity. It is important to also listen to your body during exercise. Pay attention to these signals:

- *Breathing*: during peak exercise, can you carry on a conversation without gasping? Breathing should return to normal within 10 minutes of even heavy exercise.
- *Pain*: locate it. Describe it. Is it recurring? Is it worsening? Is it persistent? Is it in or around a weight-bearing joint? Is it in the chest?
- *Dizziness*: this should not occur regularly. Also, be aware of sudden uncoordination or

light-headedness.

- *Stitch or Cramp*: this can be an indication of lack of circulation to a muscle.

- *Prolonged Fatigue*: exercise should give you energy, not take it away.

Stitch

A stictch is a pain in the side of the body which appears suddenly during exercise. A person with a stitch will feel pain that seems to come from underneath the ribs. There exist several hypotheses as to why a stitch occurs:

- constipation and/or intestinal gas

- inadequate warm-up

- faulty breathing technique or breath holding

- muscle spasm or cramp in the diaphragm or the intercostal muscles

The stitch seems to occur most often in people who are just starting an exercise program. They may be trying to do too much, too soon, or they may need assistance in modifying their breathing patterns.

Whatever the cause, there are several techniques whcih can allevaite the pain of a stitch:

- walk briskly and breathing deeply instead of jogging

- "belly-breathing" --- force your belly out as you inhale, pull it in as you exhale --- while jogging

- stretching the arm on the affected side up as high as possible

- bending forward at the waist and breathing deeply

Muscle Soreness

This nuisance usually occurs the day after an exercise session in which you:

- worked too hard, or

- engaged in an unfamiliar activitity, or

- did new or different exercises in familiar activity

Slow, static stretching and adequate warm-up and cool-down may prevent this condition. Gentle, static stretching of the sore muscle(s), held for 30 to 60 seconds, as often as possible, will alleviate much of the discomfort.

HOW TO FIND YOUR TARGET HEART RATE

The way we read our heart rate is through pulse rate. Your pulse is the rate at which your heart rate beats. Each time your heart contracts, blood surges through your arteries. The faster your heart beats, the more surges of blood. Each "surge" is a beat of your pulse. The heart rate method for monitoring exercise intensity is based on the assumption that heart rate is a linear function of exercise intensity (the higher the exercise intensity, the higher the heart rate).

To use this technique, simply take 220 minus your age in years. This will give you an approximate maximum heart rate. You then multiply your maximum heart rate be the exercise intensity you wish to work at. For example, if the predicted maximum heart rate is 180 beats per minute (bpm) and the intensity is set at 70% maximal heart rate, the target heart rate is equal to 126 bpm.

% HR(max) X HR(max) = Target HR

.70 X 180 bpm = 126 bpm

My Maximum Heart Rate (MHR) is _____

The Training Heart Range (THR) is 55%-75% of MHR. Therefore, my target heart rate is between _____ beats per minute and _____ beats per minute.

OR

my target heart rate is between _____ beats per 10 sec. and _____ beats/10sec.

The easiest place on the body to take your pulse is on your wrist. This is because the arteries are very close to the surface of the skin in this place. The pulse can also be taken on the side of the neck. Remember to monitor your heart rate by taking your pulse using your finger and not your thumb, as your thumb has a little pulse of its own!

Throughout the day, depending on the activity you are doing, your pulse rate changes considerably. For example, your lowest pulse rate will be when you wake up in the morning. This is your resting pulse rate. Besides activity, there are many things that can change your pulse rate. If you smoke, for example, your heart rate will be higher when you are smoking than when you are not. Heart rate (and pulse) will also increase with a cup of coffee since it too contains a stimulant, caffeine.

THE IMPORTANCE OF ACTIVE LIVING

It is important that you realize exercise does not necessarily have to be structured and at the gym/club. Seize small opportunities throughout your day to squeeze in small bouts of physical activity. Remember, any movement throughout your day burns calories! For example, taking the kids to the playground could mean a 10 minute walk there and back (that's 20 extra minutes of activity). Who knows how many calories you could burn if you join in playing with the kids!

Other examples of active living include taking the stairs instead of the elevator, parking the car several blocks away from your destination and walking the remaining blocks, heavy housework (moving furniture, active renovations), dancing, gardening (steady digging, power mowing, raking leaves). The point is, do not discount the little things you do (or could be doing), the little things add up to mean alot when it comes to caloric expenditure and increased energy and physiological benefits.

COMMON PROBLEMS BEGINNER EXERCISERS MAY ENCOUNTER

1. Initial Discomfort Adjusting To A New Routine

There will be minor irritations and frustrations (ie. muscle soreness) to endure. You must be willing to endure some discomfort until the new program becomes routine. While you are accommodating physiologically to the new physical activities, you are also accommodating psychologically.

2. Embarrassment

You may feel self-conscious about exercising in public for unique personal reasons. If this is the case, you may want to try the following:

- Engage in activities which do no not require public exposure (ie. exercise at the gym during non-peak hours, or work out at home).
- Join a group of other participants who have similar characteristics.
- Accept the physical fitness program as something you have a right to do for yourself, regardless of what other people think.

AVOID

- Wearing a full warm-up suit in hot weather just to "cover up"; this is extremely dangerous because of risk of heat exhaustion.
- Exercising in isolated or dark public places.
- Attempting to exercise at someone else's pace. Set your own pace and stick to it.

3. Boredom

Initially, select activities you enjoy and find interesting, otherwise you may become bored.

- Try to increase the pleasurable aspects of the activity you have chosen (ie. detect and examine pleasurable thoughts/feelings experienced while exercising and after exercising).

- Add variety to the fitness routine with music or new routines each day.

AVOID

- Continuing with exercise that is boring.
- Discussing your feelings of boredom with friends or family members who do not exercise. They might agree exercising is a negative experience and discourage you from continuing with it.
- Examining the likelihood that you will discontinue the program in the near future.
- Ignore statements that all physical fitness programs are boring when you have only attempted one.

4. Lack Of Time

You may enjoy your exercise routine once you get into it but cannot work the fitness program into your regular schedule. To help alleviate this:

- Select a specific time that appears to be free of conflicts (ie. avoid allowing the fitness program to be scheduled "as time is available").
- Identify an alternative activity and exercise time to be substituted if the primary program must be cancelled (select a day to try it to make sure it is suitable).
- Record what is done during each exercise session on a weekly calendar (to be provided).

AVOID

- "Doubling up" on exercise sessions to make up a missed session. This will lead to frustration and possibly injury. Instead use the back up time or activity. If necessary, skip the session.
- Exercising only on weekends. This will not promote increased cardiovascular fitness. Schedule 3 sessions during the week.
- Exercising if you are not feeling well or are extremely tired, or if the weather is bad. Be flexible and use the back up activity or time.

DECREASE NEGATIVE CONSEQUENCES

Avoid Fatigue!!!

Your routine should be designed such that your heart rate stays within the target heart rate zone.

Avoid Pain!!!

You confront a real danger in exercising if you feel pain. If pain is felt, and it is greater than experienced before, the activity should be stopped. If exercising in a group aerobics class be sure it is a class geared for a beginner fitness level and that you feel comfortable.

APPENDIX B

EXERCISE HISTORY

Number: **(for research use only)**

Age:

1. How would you rate your physical activity?

   NOTE: Physical activity includes work, recreational activities that require sustained physical exertion such as walking briskly, running, lifting and carrying.

   Please check your level.

   _____ Level 1 - Little or no physical activity

   _____ Level 2 - Occasional physical activity

   _____ Level 3 - Regular physical activity at least three times per week.

2. Does your work or daily activity primarily involve: (Check only one)

   _____ Sitting

   _____ Standing

   _____ Walking or other active exercise

   _____ Heavy labour (such as lifting heavy objects)

   _____ Other (please describe)

3. Have you engaged in VIGOROUS exercise which markedly increased your breathing such as: vigorous walking, cycling, swimming, running, etc. over the last 6 months?

   _____ Yes

   _____ No

   If so, how often?

   _____ Less than one time per week

   _____ 1-2 times per week

   _____ 3-5 times per week

_____ 6 or more times per week

4. When you did vigorous exercise, how long did you spend at each session?

_____ 0-15 minutes

_____ 16-30 minutes

_____ 31-45 minutes

_____ 46-60 minutes

_____ Over 60 minutes

5. Have you ever participated in a regular (3xs per week) vigorous exercise program? If so;

When?

What type of exercise?

How long did you participate for? (ie. months)

6. Why would you like to begin an exercise program? (you may check more than one).

_____ Improved physical health

_____ Improved psychological well-being

_____ Weight loss

_____ Enjoyment/fun

_____ Other (please give reason)

APPENDIX C

Informed Consent

Purpose:

To examine the exercise adherence patterns of sedentary adult females beginning a cardiovascular exercise program over a 12 week period.

Procedure:

(1) You will be asked to participate in an orientation one week prior to the study. The session will be approximately one hour long and will consist of information on how to begin an exercise program. Your blood pressure and heart rate will be taken after the orientation.

(2) You will be asked to exercise 3 times per week, choosing any aerobic activity desired. You will also be asked to record your weekly exercise on a chart provided for 12 weeks following the orientation.

(3) You will also be asked to meet with the researcher during the course of the study for another information session.

Consent:

I have read the above and agree to participate in this research project at my own risk. I realize that I may expect a thorough explanation of any procedure discussed in the exercise orientation and any other orientations that follow. I may also terminate my participation at any time during the study.

I understand that my anonymity will be protected by the fact that my name will not be attached to the final results of the study and that only the researcher of this study will have access to any raw data. I also understand that all results will be confidential and kept in a locked room and that, if requested, the data will be destroyed after analysis.

Having voluntarily assumed participation in the project, I hereby disclaim and release the University of Victoria, its agents, servants or employees, including all individuals involved in the research project, from any and all liability that might arise as a result of my participation as a research subject in this study.

Name_____ Date_____

Signature_____

APPENDIX D

PHYSICAL ACTIVITY READINESS QUESTIONNAIRE (PAR-Q)

Regular physical activity is fun and healthy, and for most people being physically active is very safe. However, some people should check with their doctor before they start becoming much more physically active.

If you are planning to become more active than you are now, start by answering the seven questions below. Please read the questions carefully and answer each one honestly, checking YES or NO. If you answer yes to one or more of the questions you should talk with your doctor by phone or in person BEFORE you start becoming much more physically active. If you answer NO honestly to all questions you can be reasonably sure that you can start becoming more physically active. Delay becoming more active if you are not feeling well due to a temporary illness. If you are or may be pregnant, talk with your doctor before you start becoming more active.

1. Has your doctor ever said that you have a heart condition and that you should only do physical activity recommended by a doctor?
____ YES ___ NO

2. Do you feel pain in your chest when you do physical activity?
____ YES ___ NO

3. In the past month, have you had chest pain when you were not doing physical activity?
____ YES ___ NO

4. Do you lose your balance because of dizziness or do you ever lose consciousness?
____ YES ___ NO

5. Do you have a bone or joint problem that could be made worse by change in physical activity?
____ YES ___ NO

6. Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?
____ YES ___ NO

7. Do you know of any other reason why you should not do physical activity?
____ YES ___ NO

APPENDIX E

GOAL SETTING

WHAT IS IT?

Goal setting is a motivational technique that has effectively increased performance in several areas of application ranging from business and industry, to education, sport, and to a lesser extent, EXERCISE.

Locke and associates (1984, pg. 126) have defined a goal as "what an individual is trying to accomplish; it is the object or aim of an action". A goal usually refers to attaining a specific standard on a task, within a specified time limit.

FUNCTIONS OF GOAL SETTING

There are at least 4 ways goals can affect performance.

1. By directing attention and action.
2. By mobilizing energy expenditure.
3. By prolonging effort over time.
4. By motivating a person to develop relevant plans to attain goals.

Here is how these 4 mechanisms can be applied to an exercise program.*

Directing Attention and Action

Goals provide a map for the mind which guides an individual to a desirable outcome or end.

Without setting yourself specific exercise and fitness goals, you may casually go through the motions with little thought or effort directed toward getting better or improvement.

Mobilizing Energy Expenditure/Effort

What motivates people to work hard and put out enough effort to commit to an exercise program and experience a training effect? Without someone encouraging them or

without specific objectives in mind, people are not likely to maintain an exercise program over time or work at a level of intensity that gives them significant health benefits.

By having a specific goal(s) to attain throughout an exercise program, you will probably work harder than if you had no specific outcomes in mind.

Prolonging Effort Over Time

Using goal setting in your exercise program will have a positive effect on helping you stick to your exercise program.

Goals which are properly set are not likely to be reached easily or quickly. This means you will have to work harder for a longer time in order to attain a goal.

Goals also help maintain interest. Initially, adopting an exercise program might be boring. The process of setting, reviewing, revising and updating goals keeps people continually involved. Sticking to exercise can therefore be enhanced by continuously looking at how you are progressing toward a goal or how close you are to reaching a goal.

Motivation To Develop Plans For Goal Attainment

A sedentary person who has set a personal goal of running a 10 km race in 50 minutes cannot meet this objective without a plan. In developing an action plan, any number of successful strategies can be used. The point is, when people have well defined goals that they want to achieve, they will actively seek ways to reach that goal.

*These ideas adapted from "Motivating exercise behaviors", pp. 95-100 of Wills and Campbell's (1992) book, Exercise Psychology.

POTENTIAL PAY-OFFS
OF GOAL SETTING

Goal setting is a popular motivational technique in sport and exercise settings because it has potential benefits or "pay-offs" when used and applied correctly. By setting goals an individual can:*

1. Clarify Goals and Priorities:

This may be the most important aspect of goal setting. When undertaking physical activities, many individuals "roll along" and take part without ever carefully analysing or even realizing what their goals and priorities in the activity should be. When sub-goals ("mini" goals which contribute to the attainment of a larger or future goal) and priorities are clear and targeted over a realistic time frame, the individual avoids information overload and is able to focus his/her attention, energy and activity in a more effective way.

2. Increase Commitment and Motivation

As already explained, setting goals increase internal motivation. Motivation is concerned with direction and persistence of behavior. Goals help to direct attention, effort, and persistence at tasks, therefore they increase motivation. Identifying goals may also shift attention from the negative to the positive, ie. "how hard an exercise session was" to "how well I am doing".

People who become motivated internally (rather than externally) experience an "inner drive" that keeps them persisting over time. Individuals who persist and never give up experience feelings of competence, pride in performance, and feel as if they can control and influence circumstances. The situation and environment don't provide you with your only means of motivation, you provide it!

3. See Immediate Success

When several specific goals are identified it is much easier to achieve immediate success on some of the "mini" or short-term goals and as a result, increase feelings of self-worth and self-esteem. This is especially true for those beginning an exercise program. When starting out, it is easy to become discouraged, since long-range or future goals do not come quickly or easily. The setting of goals can help alleviate this, and provide you with some tangible success!

4. Improve Confidence and Morale

Flowing from the success of goal attainment and being in control of decisions about your own health, fitness and well-being, increased self-confidence will result.

5. Improve Coping Capabilities

Clear behavioral (what you will do) goals are an important step in improving self-discipline and self-control. When you specify what you must do in behavioral terms, chances of coping better with stressful situations or environments are increased. If you have clear goals, focusing on things related to the task will be more likely, and being distracted by irrelevant stress producing things that are out of one's control will be less likely. The increased self-confidence from attaining sub-goals also helps prevent feelings of threat or stress from things around you that are out of your control (ie. a loved one's aggravating behavior).

6. Appreciate Planning and Goal Setting

Successful and satisfied exercise participants are continually evaluating their situations/needs, prioritizing their goals, and taking initiatives to implement their strategies and plans before re-evaluating progress. When you begin to realize the potential of the goal setting model for increasing satisfaction and performance in exercise, the model can be applied to different aspects of life (ie. school, hobbies, relationships, job).

7. Improve Communication

When goals and behavioral expectations of yourself are clear, you are more likely to be open and responsive in communication with others and exercise leaders/professionals regarding progress and problems. Learning to recognize your own individual needs, asking for feedback on what you are doing or are thinking about doing, communicating clear messages, monitoring and reinforcing your behavior and regularly taking a look at progress are all important skills for persistent exercisers.

*These ideas adapted from Cal Botterill's (1983) article "Goal setting and athlete development".

PRINCIPLES OF GOAL SETTING

"Whatever you can do, or dream you can, begin it."

-Goethe

Research in business and industry has generated most of what is known about goal setting and performance. Many of these principles have application to the exercise setting, with some special considerations.*

Specific goals are more effective than general goals.

General statements such as "do your best" do not tell a person what to do, when a task has been completed, or how well it has been done. Goals that are specific and measurable let you know exactly what needs to be done. However, goals should not be so specific that they cannot be modified if necessary.

Difficult or challenging goals result in better performance than easy goals.

Assuming that you have the ability, the higher the goal, the higher the performance. Goals should be realistic for an individual based on age, sex, present physical condition, and interests. For best results, goals should be both specific and challenging.

Use short-term or intermediate goals in combination with difficult or long term goals.

Setting short-term manageable goals allows you to see the necessary steps involved in the attainment of a long-range or future goal. Intermediate goals (mini goals) also allow you to observe and experience immediate improvements in performance and therefore enhance motivation. Without short-range goals, it is easy to lose sight of the future goals and the progression of skills/behaviors needed to obtain them. Short-term goals also allow goals to remain realistic and controllable. As your goals become more realistic, you should experience more success. Thus, short-term goals provide you with many more opportunities to feel good about

yourself by reaching your goal. The more success you have at reaching short-term goals, the more confident you will be. If you are highly self-confident, you won't fear failure and be more motivated to work hard and achieve success.

Remember, both short-term and long-term goals are valuable. For example, you may want to increase your energy level and loose weight. These future goals give you specific direction toward which to channel hard work and effort, but the key to the success of this long range goal is the type of short-term goals you establish to reach it.

Goal setting is made more effective when feedback is provided to point out progress.

Periodic evaluation lets you know if your progress is on or off-track. Measurements of recovery heart rate after exercise, percent body fat, or keeping track of when you exercised and for how long are examples of periodic assessments that inform an individual of progress toward their goals. Feedback can also motivate you to work out more often or harder.

Some fitness activities have built-in feedback. For example, a person doing sit-ups knows how many repetitions he or she has done, a person walking on a treadmill knows how many kilometres they walked in twenty minutes and what their heart rate was while exercising. Feedback is only of value when it directly relates to a goal (ie. in the case of walking on the treadmill, heart rate should be compared to one's target heart rate).

To be effective, goals must be accepted by an individual.

Goals that are important and meaningful to you are more likely to result in a commitment to their attainment. If you set a goal(s) which has no internal value, it is unlikely you will work to achieve it. For example, are you exercising because you want to feel better or are you doing it because someone else wants you to? Are you trying to loose weight because you want to or is it to please and be accepted by someone else? Setting goals that are important to you (not other people) are more likely to be worked at and achieved.

In order to clarify your motive(s), ask yourself these two questions:

1. Is this goal more important to others than it is to me?

2. Do I feel I "should" or "ought" to accomplish this goal or do I "want" to do it?

Developing a strategy or action plan facilitates goal attainment.

If you have multiple goals, you must devote time to each. For example, if a person wishes to improve strength, cardiovascular fitness and increase their energy level in daily tasks, each of these dimensions must receive attention. A plan in which a person decides to cycle three times per week for 29 minutes at an intensity of 70% of their maximum heart rate, work on strength two times per week, and take the stairs at work instead of the elevator illustrates this approach.

*These ideas adapted from the following:

Locke and Latham's (1984) book, Goal Setting: A Motivational Technique That Works!

"Motivating exercise behaviors", pp. 95-110 of Willis and Campbell's (1992) book, Exercise Psychology,.

Damon Burton's (1989) Goal Setting Training Manual used in the study, Winning Isn't Everything: Examining The Impact of Performance Goals on Collegiate Swimmers' Congnitions and Performance.

*HOW TO GOAL SET**

1. Specify The General Objective Or Tasks To Be Done.

This involves simply **WRITING** down what is you would like to accomplish with regard to your exercise program. This can initially be one or several general objectives. By writing these down you can see them on paper and not lose sight of what it is you wish to accomplish later. Keep a goal setting journal reserved specially for any goals you would like to accomplish in your exercise program. Because this goal or goals are general and probably longer term or in the future, the next thing you need to do is....

2. Specify Any Short Term Goals Which Will Lead To The Accomplishment Of The General Objectives/Tasks.

You need to identify what can be done in the short term to accomplish your future goal(s).

As with long term goals, short term ones should be written down. These goals also need to be behavioral and state what you actually need to do to achieve them. For example, "I'm going to be more active" or "I'm going to reduce my resting heart rate to 60 beats per minute" are fine as general starting points or objectives, however, these are not helpful short-range goals. The first is not specific enough, and the second is not behavioral (does not state the what and the how). Instead, "I'm going to take 3 - 30 minute walks this week at an intensity of 60% of my maximum heart rate" and "I'm going to ride a total of 20 miles this week on the stationary bike at the gym" are more helpful, assuming they are realistic and achievable. Be sure to choose goals that require changes in your behavior and not changes in the behavior of others.

3. Remember To Keep Short Term Goals Flexible.

Setting goals which are too rigid are at a greater risk of being abandoned if an unforeseen circumstance comes up. Yes, be specific when stating your goals, but only moderately so. If you decide as a general goal "To become more physically fit" and set the short term goals of exercising

at 5 p.m., Monday, Wednesday and Friday, choosing the treadmill as the mode of exercise for 25 minutes at 65% of maximum heart rate for a month. What happens if there are employee cutbacks at your job, you must work overtime (until 7 p.m.) Monday through Friday and there are only two treadmills at your gym, one of which is broken, and the other which is limited to 15 minutes per person during peak hours? You can specify the days of the week which you will exercise, and you should choose your mode of exercise, however, it would be better to have some alternatives picked out so that when and if barriers do present themselves, you do not abandon your long term objective of becoming physically fit.

4. Make Your Goals Difficult But Realistic.

When goals are too easy and do not provide a challenge, they generally do not motivate people to produce much effort, only the minimal amount necessary to attain the goal. On the other hand, when you challenge yourself by setting a goal that seems out of your reach but still possible to attain, you become motivated to direct more energy and effort at achieving the goal.

This is a very **individual** process. What may seem "easy" for one person, may be very difficult and challenging to another. Each individual has their own genetic potential, physical make-up, mental outlook and even goal orientation when it comes to exercise. For example, if you have not exercised in 5 years and would now like to make exercise a part of your lifestyle, setting a goal of exercising 6 days per week at 75% of your maximum heart rate may be a difficult yet attainable goal for you in the future if you progress slowly (ie. start at 3 times per week, at 60% of maximum heart rate), can devote the time and pick an activity you enjoy. However, if you are a single mother who works all day, and has a family history of heart trouble, exercising 6 times per week at 75% of MHR may not be feasible (or perhaps it is if you can choose an activity which is easily accessible, have child care, and get the "ok" to exercise from a doctor). My definition of physically fit may mean working out 12 hours per week, your definition of physically fit may mean being able to walk to work without being fatigued and do gardening without muscle soreness. The point is, every person's goals are individual and as such have different meaning. In view of this, set goals that **you** think are challenging and motivational. If they prove too easy or difficult, you can adjust

them. Use the following goal setting rule:

Set your goal at or slightly more than what you realistically expect for the existing circumstance. Thus, your goal is realistic but yet challenges you to try your best for how you feel today.

5. *Determine How Progress Toward The Goal Will Be Measured.*

Progress in fitness and exercise programs can usually be measured easily. Time, intensity of the exercise (as measured by heart rate), cardiovascular benefits (as measured by resting or recovery heart rate after exercise), distance (miles, kilometres), and number of sit ups performed are all examples of overt measures in exercise programs. After a goal is identified, progress toward it can be charted simply by keeping track of things such as heart rate, duration spent or the number of days per week the exercise was performed.

6. *Specify The Standard Or Target To Be Reached*

The specific degree of performance to be achieved should be indicated. For example, running 10 miles per week, doing 12 aerobic classes per month or losing 2 pounds per week for 10 weeks are examples of specific degrees of performance. Past performance is the best way to identify the standard or target to be reached. In this case, your performance since the study began should be reviewed and standards set based upon it.

7. *Specify The Time Period In Which The Goal Will Be Reached.*

This step can be done when the standard or target is specified. You must specify a target date or deadline to accomplish goals so that you are directed. Target dates can also help increase motivation by reminding you of the urgency of accomplishing objectives in realistic lengths of time.

8. *Prioritize Goals.*

When multiple goals are set, it is helpful to rank them in order of importance so you do not become overwhelmed and can direct your attention appropriately. Simply make a list of the goals

in order of importance and allot the amount of time to be spent on each. Some of your long term goals may involve the same or similar short term goals to accomplish them. If this is the case, you can be accomplishing some goals at the same time!

9. Focus On What You Want To Accomplish Rather Than What You Hope To Avoid

When you are setting goals for something which you have little or no experience with or are unfamiliar with, it is better to focus on what you want to accomplish. This means keeping goals in positive terms rather than negative. Identify behaviors to be exhibited as opposed to behaviors that should be extinguished or inhibited. For example, rather than saying you will decrease your body fat by exercising 3 times per week, say you will increase your lean muscle mass by exercising 3 times per week. Rather than saying "I will not go home and watch t.v after work, I will go to the gym", simply state, "I will go to the gym after work to exercise".

Negatively focused goals that emphasize minimizing mistakes or behaviors are more effective for well-learned or well maintained tasks.

10. Make Sure Feedback For Goals Is Provided

As mentioned, feedback enhances the success of goal setting. With exercise, feedback is often built in (as measurement is). Knowing how long you exercised, how many times per week, whether or not you were in your target heart rate zone, or number of kilometres covered are all examples of feedback. Soliciting feedback from others can also be used (ie. asking an aerobics leader if they have noticed you are trying harder, or a significant other how you have been adhering to exercise). However, **you** provide the best feedback. Monitoring your resting heart rate in the morning, and after exercise and recording it are feedback. Charting your exercising every week is feedback. Feeling more energetic mentally and physically are feedback.

11. Be Committed To Goals

For goals to have high motivational value, you must have a high degree commitment to their achievement. To increase commitment to goals, you can enlist the support of others (you

want individuals who will provide you with support and encouragement; not sabotage your goals) and you can provide incentives or rewards for yourself when setting and attaining goals (anticipate that setting goals for exercise sessions can make it fun). *Note: Incentives and rewards do not have to be "material" rewards, they can also be positive self-statements/acknowledgments or encouragement from others.*

12. Modify Goals When Necessary

Goals are typically based on knowledge of the past and certain predictions about the future. Sometimes such predictions will be wrong and new conditions may require changing previously set goals if the new situation makes them inappropriate. For example, a long-range goal may have been quite helpful in guiding your exercise and activity, but you may come to see you won't be able to reach this original long-range goal as it may not be feasible at this time. You may evaluate yourself negatively and all your efforts so far may "go out the window". This does not have to happen! Instead, identify obstacles and find ways/solutions for overcoming them. If goals turn out be unrealistic, you may want to lower them, gain some success at the lowered goals and then raise them to a higher level again once you have attained the lowered goals. However, goals should not be changed every time an obstacle arises. Remember, learning consists of periods of progress followed by longer plateaus where little improvement occurs. It is virtually impossible to predict when you will reach a plateau and how long it will last.

13. Monitor Goals And Periodically Evaluate Them

Goals written down should be examined and compared to performance so far in order to see where you are at in terms of their attainment. If necessary, you can modify or change a goal(s). If partially attained, you can reward yourself. You can also see how close you are to reaching your long term or future goal(s) as are sub-goals attained or working well.

How often should you evaluate and monitor goals? If monitoring and evaluation are too infrequent, you will have difficulty seeing improvement, which is necessary for internal motivation and to keep you going. On the other hand, if monitoring takes place too often, you may become

too obsessed with the outcome. It is best to maintain the same goals for weekly intervals rather than examining them daily. In general, it is a good idea to evaluate goals about once every two or three weeks.

14. Develop An Action Plan To Help Make Goal Setting Work.

Action plans describe the how you will accomplish your goals/objectives. Action plans can focus on general future goals or they can focus narrowly on the most immediate decisions for achieving short term goals. Action plans should also identify the costs and benefits to both yourself and to significant others in the relation to the goal(s) set. Potential barriers and negatives what could impede the goal's success as well as the positives needed to enhance its success should be listed.

*These ideas adapted form the following:

Locke and Latham's (1984) book, Goal Setting: A Motivational Technique That Works!

"Motivating exercise behaviors", pp. 95-110 of Willis and Campbell's (1992) book, Exercise Psychology,.

Damon Burton's (1989) Goal Setting Training Manual used in the study, Winning Isn't Everything: Examining The Impact of Performance Goals on Collegiate Swimmers' Congnitions and Performance.

DANGERS/PITFALLS IN GOAL SETTING

Goal setting has a "Jekyll/Hyde" nature to it. Most researchers and practitioners view goal setting as a positive motivator designed to improve performance by focusing attention and promoting harder work and persistence. However, when used improperly, goals can also become a major source of stress because they become the standards by which people may define failure as well as success. Here are some potential problems to be aware of when goal setting.*

Increased Stress

To be under stress, something that is important to you must be at stake. Threats to goals can come in many forms in relation to exercise. For example, you may not be able to reach a goal because of time, work or family constraints. The actions of others may prevent implementing a plan of action (ie. your spouse does not agree to look after your children while you go to the gym in the evenings for a work out, or your favourite piece of cardio equipment is always in use at the only time you have to exercise). Observe that if you are totally secure regarding the achievement of your goals, then there is no stress. Of course, you do have the choice of abandoning the goal and eliminating all stress, but then the goal is lost altogether.

Stress is greater if an individual, based on past habits, does not trust herself to take the appropriate actions to achieve the goal when a threat does occur.

Difficult goals have a greater risk of failure than less challenging goals. Goals that are too difficult should be lowered. What starts out as an attainable, yet challenging goal may become unattainable and unrealistic as situations change and you fail to adjust your goals accordingly. For example, you should be aware of barriers (ie. you become ill for a week, a spouse or child becomes ill, or you have to work overtime). When this happens, you must lower your goals to an appropriate level. This is also why it is advisable not to have too many short term goals either, since goals should be flexible and adjustable.

GOALS SHOULD MOTIVATE YOU, NOT STRESS YOU !!!

Failure

There is no guarantee of success when you set goals for yourself regarding your exercise. If you set a realistic (yet challenging) goal, develop a workable action plan, and work hard to achieve it, success is more likely than if one or more of these ingredients is missing. BUT!!! Success is never certain. For example, the goal may turn out to be much harder than expected, the action plan may be unsuitable for unanticipated reasons, the time originally allocated to attain the goal may not be sufficient, or obstacles which were unknown and perhaps even nonexistent at the time the goal was set may be impossible to overcome. Failure can lead to feelings of self-doubt, feelings of inadequacy, anger (at oneself and at those who seem responsible for blocking progress), lowered self-esteem, anxiety (about the future) and/or depression.

How to avoid these feelings? Initially, treat goal failure as a problem to be solved. Ask yourself and write down the answers to the following questions:

- ***Why did the goal fail (is it failing)?***
- ***Does the difficulty of the goal need to be readjusted?***
- ***Does the time frame need to change?***
- ***What behavior(s) am I exhibiting to impede my goal(s) from being attained?***
- ***Can I realistically change any of these behaviors to help with goal attainment?***
- ***What external factors that are beyond my control are getting in the way of me reaching my goal(s)?***
- ***Would changing or modifying the goal get rid of any of these external factors that are inhibiting my goal(s)?***

Then you should identify a modified version of the original goal and write down how the previously inhibiting external factors will now be altered or changed. Are there other people that can be enlisted to help with this newly modified goal other than those you have asked already?

Finally, it is also important that you give yourself credit for any partial (no matter how small) goal attainment.

Positive Stress

Finally, it should be mentioned that some stress can be good for us. Stress can have a positive affect on people's lives. Much depends on how you chose to view the obstacles to attaining your goals. If you fear the obstacles that come up, feel angry or give up altogether, you may be disappointed. But if instead you see the obstacles as a challenge to be overcome, making you exert your greatest effort and the chance to be and feel physically and mentally healthy, you can experience excitement, a sense of purpose and the joy of goal accomplishment. Researchers Locke and Latham (1984) provide a quote in their book on goal setting in business and industry by an unknown author: "People who have been successful in everything they have attempted have set their goals too low".

*These ideas were adapted from Damon Burton's chapter, "The Jekyll/Hyde Nature of Goals: Reconceptualizing Goal Setting in Sport", pp. 267-297, found in Horn's (1990) book, Advances in Sport Psychology.

Listing Your Goals

1. List any general objectives or future goals you would like to attain with regard to your exercise program over the remaining weeks of this study.

2. (a) Under each objective, list any sub-goals or short term objectives which will help contribute to the future goal(s). (b) Beside each sub-goal, specify how it will be measured.

   For example:

   Long term goal = To become more physically fit

   Sub-goals that will help contribute:

   1. Exercising at 70% of my maximum heart rate (measured by my heart rate, which at 70% is 126 bpm).
   2. Walking on the treadmill 3 times per week (measured by writing down the day of the week I am walking, how much time has lapsed - ie. 25 minutes including warm-up and cool down).

3. List the future goals identified in order of importance (Prioritize your goals).

Developing An Action Plan

Now that you have identified both future and short term goals for exercise, you must develop an action plan. Take one future goal at a time and work from there. Several of your future goals may be listed if they are related in some way, and therefore require many of the same short term goals for their accomplishment.

1. My future goal (s) with respect to exercise is:
   Example: To lose weight

2. My short term goal(s) that will help me achieve my long term goal is/are:
   Example: exercising 3 times per week at 60% of my maximum heart rate, eventually working up to 75% of max. HR., for 30 minutes a day for the next 4 weeks, eating more fresh fruits and vegetables and cutting out desert for the next 4 weeks.

3. The specific things I must do to achieve each short term goal(s) are: (be sure to specify in behavioral terms).

   Example:

   - Put my work out clothes in the car and drive directly to the gym after work.
   - Decide which days of the week to exercise (ie. Monday, Wednesday, Friday) and identify a time and write this down.

4. I will complete my future goal(s) by _____ (specify a date - you may write down different target dates for different future goals).

5. The benefits to myself of achieving this long term goal are:

   Example: More energy, more self-confidence, less stress.

The benefits to significant others in my life of achieving this long term goal are:
Example: More energy for when I spend time with them, good moods.

6. The costs to me of attaining my future goal(s) are:
Example: Paying monthly dues to the health club, giving up time to get to and from the gym.

The costs to significant others in my life of attaining these future goals are:
Example: Less time to spend with family due to work outs, I may complain about being sore or tired.

7. List any factors (in the environment or within yourself) which could serve as barriers to attaining any of the short term goals listed in this action plan.
   Example:
   Environment: working overtime, car breaking down.
   Within Self: Fatigue, lack of motivation..

8. Come up with solutions or alternatives you will use if any of these barriers should become a reality.
   Example: I will identify alternative times and days to exercise as well as other activities I could do outside the gym (ie. go for a vigorous walk at lunch time for 20 minutes, or go for a walk after work for 20 minutes).

9. I will enlist the support of the following people (person) in the attainment of the following short term goals:

Evaluation/Goal Monitoring

Now that three weeks have passed, it is time to evaluate and review your goals. This is simply to get you to look at how are things are going with your exercise and goals. You may find that you wish to keep and try and maintain some of your short-term goals, since you are just getting into the "swing" of things. On the other hand, some original goals may need to be changed or dropped altogether. Let's look at your original long term or future goals:

The future goal(s) I am reviewing is/are _____ .

_____ .

_____ .

1. Which short term goals have you been achieving so far?

2. Which short term goals have you not achieved?

3. List any barriers that have come up along with the goals they are preventing.

List any factors which have facilitated or helped you with your short term goals so far.

4. For any goals accomplished, list some new and more challenging ones.

5. If any goals need to be modified or adjusted please write down the original goal along with a modified version and give a reason(s) for its modification.

6. Which goals have you not attained will you keep and try to attain 3 weeks from now (at the next evaluation)?

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APPENDIX F

Past Physical Activity Questionnaire

These questions are designed to explore if you have ever been involved in physical activity programs in the past, and if so when and for how long.

1. After leaving school and prior to the study, have you ever been involved in a regular physical activity program (at least 3xs per week for 15 minutes or more which markedly increased your breathing?)

2. Prior to the study, were you ever involved in recreational or competitive sports?

   If so, what sport(s)?

3. Prior to the study, did you incorporate activity into your daily lifestyle (ie. Walking to work, taking the stairs instead of the elevator)?

Activity Enjoyment

List the activities (include gym or activities outside of the gym) you chose to engage in during the study. For each activity please rate it on the following scale:

1 = Not enjoyable at all
2 = Somewhat enjoyable
3 = Enjoyable
4 = Very Enjoyable
5 = Extremely enjoyable

For example:
1. Step classes = 4
2. Walking = 3

Attitudes Toward Physical Activity

These questions were designed to explore how you view physical activity and feel about it in general.

1. In my opinion physical activity is

_____ Very Important

_____ Important

_____ Somewhat Important

_____ Not Very Important

_____ Unimportant

2. In my opinion my current health status is...

_____ Excellent

_____ Very Good

_____ Good

_____ Poor

Please rate your confidence in your ability to perform the following physical activities at the gym BEFORE you became involved in the study.

With respect to aerobic dance classes at the gym, I had:

1	2	3	4	5	6	7
low self-confidence						High Self-confidence

With respect to riding the stationary bicycle at the gym, I had:

1	2	3	4	5	6	7
low self-confidence						High Self-confidence

With respect to walking/jogging on the treadmill at the gym, I had:

1	2	3	4	5	6	7
low self-confidence						High Self-confidence

With respect to weight training at the gym, I had:

1	2	3	4	5	6	7
low self-confidence						High Self-confidence

With respect to the circuit training class at the gym, I had:

1	2	3	4	5	6	7
low self-confidence						High Self-confidence

Please rate your confidence in your ability to perform the following physical activities at the gym AFTER you became involved in the study (only rate those activities you chose to engage during the study).

With respect to aerobic dance classes at the gym, I have:

1	2	3	4	5	6	7
low self-confidence						High Self-confidence

With respect to riding the stationary bicycle at the gym, I have:

1	2	3	4	5	6	7
low self-confidence						High Self-confidence

With respect to walking/jogging on the treadmill at the gym, I have:

1	2	3	4	5	6	7
low self-confidence						High Self-confidence

With respect to weight training at the gym, I have:

1	2	3	4	5	6	7
low self-confidence						High Self-confidence

With respect to the circuit training class at the gym, I have:

1	2	3	4	5	6	7
low self-confidence						High Self-confidence

Post-Study Exercise and Goal Setting Questionnaire

1. Did you use the goal setting strategies in your exercise and activity program?

_____ YES

_____ NO

2. (a) If so, were you committed to the attainment of the goals you set for yourself?

_____ YES

_____ NO

(b) Which general goals have you attained?

Which ones have you not attained?

(c) Which short term goals have you attained?

Which ones have you not attained?

3. Will you continue to use any of the goal setting strategies you learned in your leisure activities and exercise program?

_____ YES

_____ NO

4. Please indicate those things (other than goals you had for yourself) which helped you become motivated to perform physical activity (ie. music, an instructor at the gym). Please be very specific.

5. In your opinion did the researcher's presence (my presence) at the club help or

hinder you to perform physical activity at the gym? Please explain how she was a help or not a help to you.

Social Support and Barriers to Exercise

1. If supportive were defined as how much encouragement and help someone gave, to what degree were significant others (ie. family, friends) supportive of your desire to exercise regularly over the past 12 weeks?

   _____ Very Supportive

   _____ Somewhat Supportive

   _____ Neutral (neither supportive nor unsupportive)

   _____ Unsupportive

2. Did you have convenient access to the gym throughout the study (ie. adequate transportation, the club was open during hours that fit into your schedule, you had child care)?

3. Were the gym activities you chose convenient (ie. no line-ups for equipment)?

4. If you engaged in activities outside of the gym, were these convenient (ie. Did weather inhibit them, did you have time and transportation to do them or get to them)?

5. Please list any barriers that came up in the past 12 weeks that inhibited you from performing physical activity either at the gym or outside of the gym.

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Goal Setting and Adherence to Physical Activity of Sedentary Adult Females

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April 15/96
(Date)