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THE EFFECTS OF SOCIAL SUPPORT INTERVENTION AND SELF-EFFICACY COGNITIONS ON EXERCISE ADHERENCE

By

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ABSTRACT

THE EFFECTS OF SOCIAL SUPPORT INTERVENTION AND SELF-EFFICACY COGNITIONS ON EXERCISE ADHERENCE

By

Kathleen Jo Buchko

There is little systematic research that has demonstrated the use of social support in helping people maintain exercise regimens. Even less research has compared various types of social support with each other to evaluate their usefulness in exercise adherence. Self-efficacy has also begun to receive a great deal of attention in the area of exercise adherence, but questions remain regarding the ability of self-efficacy to explain exercise adherence as a lone variable or in and interaction with other variables such as social support. This study examined the relationship between social support, self-efficacy, and social support. Three hypotheses were tested: (a) subjects who received social support would show greater adherence to an aerobics program than those who did not receive social support; (b) greater amounts of social support would result in greater adherence; and (c) those with greater self-efficacy would show greater exercise adherence overall, regardless of the amount of social support they received. Female college students from two universities were assigned to one of four conditions: no social support, relapse prevention, buddy, or telephone. All subjects participated in a voluntary aerobics program. A 2 X 4 analysis of variance (self-efficacy x social support type) was performed to compare

differences between the three social support groups and control group on exercise adherence. Results indicated that there was no significant statistical difference between the social support groups on exercise adherence, but subjects with high self-efficacy showed a greater rate of adherence (as measured by attendance) than subjects with lower self-efficacy. These results indicate that self-efficacy is an important factor in the development of exercise adherence. Results also suggest a need for further research in the use of social support in exercise programs.

For Aaron,
with all my love forever,
my parents, with thanks
for their love and support
and for Alexandra,
who helped me give birth
twice in a summer

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...and the birds flew
and they were not afraid...

Kathleen J. Buchko
Peoria, Illinois
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TABLE OF CONTENTS

LIST OF TABLES

LIST OF TABLES
(continued)

Chapter One

INTRODUCTION

Why do so many people find it hard to maintain an exercise program? New Year's resolutions are often quickly broken, and the reasons for quitting are as varied as the people who try to exercise regularly. But are there ways to help people keep the promises they make, to help them "stick" with exercise over the "long haul," to help people achieve their stated exercise goals?

Lasting behavioral change is difficult to attain. Anyone who has ever tried to stop an undesirable habit such as smoking or has tried to start a new behavior such as exercise can relate to the frustration felt by so many. In the last decade, psychologists have begun to explore the complexity of the problem of adherence to healthy behaviors. Much work remains to be done.

Over the last several years, counseling psychology has expanded the scope of its research and therapy issues. Counseling psychology has a strong history of being interested in preventive interventions and in helping relatively healthy individuals learn to improve their quality of life by increasing their ability to function in various life situations.

A specific area in which counseling psychology has been applied is health psychology. Health psychology bases its interventions on educational models that are often preventive

in nature, rather than traditional illness-based medical models. The premise of the educational models is that "changes in attitude and self-awareness precede possible long-term lifestyle adjustments in the name of improved physical and mental health" (Klippel & DeJoy, 1984, p. 220). Counseling psychology as a field is aware of the importance of internal changes in belief and perception when making permanent adjustments in behavior and lifestyle. The mind-body interaction that affects health and disease is now being considered as a legitimate area in which counseling psychology can conduct research and make contributions (Klippel & DeJoy, 1984).

Counseling psychology has a heritage and reputation of using psychoeducational strategies (Kagan, 1980) that help people cope individually and in their interactions with each other and their social environments. Also, counseling psychology maintains the position that individuals are the primary agents of change. Counseling psychologists are well-equipped to bring to health psychology their knowledge of interpersonal skills and dynamics, which can help in the work of promotion and maintenance of health, as well as the prevention and treatment of illness (Kagan, 1980).

The medical field has begun to redefine health and illness and how treatment should be provided (Alcorn, 1991). Professionals are realizing that many factors, physical and psychological can interact to cause a behavior, a symptom, or even a disease. Counseling psychologists can provide an

important perspective by emphasizing the psychological aspects of physical health and the prevention via the promotion of healthy lifestyles.

Altmaier (1991) pointed out that the methods used by psychologists to promote the agenda suggested by Alcorn (1991) are varied and plentiful. One of the methods Altmaier has suggested is consultation. She notes that patient compliance to health-related behaviors and medical regimens could be improved through the intervention of counseling psychologists. Patient compliance is generally quite poor and in need of improvement (Haynes, Taylor, & Sackett, 1979). Altmaier (1991) suggests that through assessment, research, and helping improve communication and understanding between health care providers and patients, counseling psychologists can have an important impact on the health and medical fields.

Adherence to health behavior has also received a growing amount of attention in the health psychology literature. Initially, the focus had been on adherence to treatments prescribed by physicians, especially pill-taking and other more specific medication-focused regimens, such as those required by diabetes patients. Much of the research has also emphasized the importance of the one-to-one relationship between the patient (or client) and the professional providing the service (Becker, 1985). In recent years, a growing number of researchers have also studied adherence to other health change behaviors in such areas as smoking cessation, alcohol and drug abuse, and exercise and weight control strategies

(Dishman & Dunn, 1988).

In addition, the growing field of exercise science has developed an important branch called exercise psychology that seeks to address the psychological and behavioral implications of exercise participation (Willis & Campbell, 1992). This area, while still in its early stages, has seen rapid growth in the last 10-15 years.

The physical reasons for trying to improve exercise adherence are well-documented and many reviews confirm the benefits of regular physical activity in people's lives (Bouchard, Shephard, Stevens, Sutton, & McPherson, 1990). Physical activity has been shown to significantly decrease blood pressure and the risk of coronary heart disease, increase the effect of insulin in noninsulin-dependent diabetic patients and perhaps delay or lessen the development of osteoporosis (Siscovick, LaPorte, & Newman, 1985). There is empirical evidence to support the relationship between physical activity and reduced low back pain, reduced risk of colon cancer in men, and reduced risk of "all-cause" mortality (Bouchard, Shephard Stevens, Sutton, & McPherson, 1990).

People who engage in physical activity reap psychological as well as physical benefits. (Tuson & Sinyor, 1993; Morgan, 1987). Physical activity has been shown to reduce symptoms of moderate depression and generalized anxiety (Harris, Caspersen, Defriese, & Estes, 1989; Martinsen, 1990). Plante and Rodin (1990), in a review of the professional literature on exercise and psychological functioning, concluded that

exercise improves self-concept and self-esteem, mood, and psychological well-being. Mild anxiety, depression, and stress were also found to decrease with exercise.

One might expect that since the physical and psychological benefits of exercise are becoming clearer and this information is being disseminated through popular media, more people would currently be physically active. However, this is not the case (Wankel, 1988). Dishman (1988) has found that 70%-80% of American adults are sedentary. In addition, when studies do show people increasing their physical activity, those individuals are generally already active. The sedentary individuals are often not showing an increase in their level of physical activity.

Therefore, an obvious step is for psychologists to examine, through structured research, how clients could maintain involvement in exercise to gain greater psychological as well as physical health. A recent position statement released by the International Society of Sport Psychology (1992) delineated six major potential psychological benefits of physical activity. The benefits were: reduction of state anxiety, decrease in the level of mild to moderate depression, reduction of neuroticism and anxiety (if exercise participation has been long-term), an adjunct to the professional treatment of severe depression, reduction of various kinds of stress, and beneficial emotional effects for all ages and both genders.

In an early review, Dishman (1982) described the status

of the exercise adherence research at that time. He noted that little attention had been given to this area by psychology researchers, and stressed the importance of their involvement. Counseling psychology could find ways to impact this relatively new field and contribute via exploratory and theoretical research and development.

Dubbert (1992) argued persuasively that because recent research suggests that intervention can improve adherence to exercise, further work should "continue to elaborate the effects of physical activity" and to give priority to the crucial issue of exercise adherence. Dubbert further pointed out that, unfortunately, there have not yet been any great advances in exercise adherence research. She suggested shifting the research emphasis from exercise adherence to emphasizing "exercise as behavior" (Dubbert, 1992, p. 617), thus, making better use of the behavioral science models and theories that have been used to examine changing negative health-related behaviors such as various addictions and eating disorders to investigate the area of physical activity.

In the patient and illness literature, there is a longer history of studying the problem of compliance, particularly to a medically-prescribed regimen. Leventhal and Cameron (1987) discussed the major behavioral theories that had been utilized. They listed the five major theoretical positions as operant behavior, social learning, rational belief theory, a communications approach, and self-regulative systems theory. Although each of these theories has a different perspective of

non-compliance, they all focus on similar processes involved in compliance. These are risk perception, motivation, learning coping skills, and cognitive and emotional appraisal of the illness. They concluded that compliance research has much to offer in improving the adaptation and maintenance of preventive behaviors that could ward off potential health threats.

Indeed, many of these broad theoretical categories that have been applied to medical compliance have also been utilized in the investigation of exercise adherence, particularly the behavioral and social learning theories. Many self-regulative techniques have been examined as well (Dishman, 1991). The number of reviews (Dishman, Sallis, & Orenstein, 1985; Dishman, 1991; Godin & Shephard, 1990; Lee & Owen, 1986) are evidence of the number and variety of factors and theories that have been tested in the exercise adherence area.

Lee and Owen (1986) argued that the major psychological theories that have been used attempt to better understand the adoption and maintenance of exercise behaviors. They included learning and behavioral theories, cognitive-behavioral theories, self-management theories, social psychological theories, and social learning theory in their review, and considered these theories to be the most popular with exercise adherence researchers today.

Lee and Owen (1986) determined that several theories had something to offer the field of exercise adherence, but that

so far no theory had clearly become the dominant or most explanatory. However, they gave strong support to two concepts that come from social learning theory, namely relapse-prevention and self-efficacy. Self-efficacy is the belief individuals have regarding their ability to perform a certain task at a given level (Bandura, 1986). Self-efficacy is determined by an individual assessing his or her own physiological status, past performance of a task, vicarious experiences, verbal persuasion, and emotional arousal (Bandura, 1986). Relapse-prevention has its origins in substance abuse treatment, and involves identifying potential barriers to maintaining abstinence (Marlatt, 1982). Relapse-prevention will be discussed in greater detail in Chapter Two.

Because several theories still seem to hold promise, Lee and Owen (1986) suggested that in theorizing about actual interventions, consideration should be given to including several interventions from many of the theories, since no theory has been found to be superior. They stress the importance of remembering that the strength of any intervention lies in its specificity, and its design for a predetermined group and/or setting.

More recent reviews have argued for specific theories and pointed out via existing research that some theories do show more promise than others. For example, Godin and Shephard (1990) reviewed six main theories that are the most utilized in the field of exercise adherence today. They are the Health Belief Model, Protection Motivation Theory, Social Cognitive

Theory, the Theory of Reasoned Action, the Theory of Interpersonal Behavior, and the Theory of Planned Behavior. (These theories will be discussed at length in Chapter Two.)

Godin and Shephard (1990) concluded that expectations of self-efficacy, attitudes toward exercising, perceived barriers to exercising, past exercise behavior, and intention all had a fairly strong influence on exercise adherence. Essentially, they found that while these variables were derived from different theories, several of the theories had infused self-efficacy into their respective models in some way. Therefore, they concluded that Social Cognitive Theory, particularly its construct of self-efficacy, was presently capable of explaining more of the variance than the constructs of other theories.

Dubbert (1992) highlighted the use of social and social-cognitive theory (Bandura, 1986), as well as models within these areas, such as relapse-prevention (Marlatt & Gordon, 1985). She called for the further study of other interventions inspired by social learning theory that show promise in the exercise adherence domain.

McAuley and Courneya (1993) pointed to the superiority of attitudinal and self-efficacy influences as being among the most important determinants in exercise adherence. They echoed the fact that earlier theories applied to adherence have since been modified by adding the concept of self-efficacy to explain adherence to physical activity. More specifically, they stated that while the theories of reasoned

action and planned behavior have been beneficial to the research of exercise adherence, the explanatory capability of these theories has been increased by the infusion of the social cognitive construct, self-efficacy.

Because self-efficacy theory calls for a reciprocal determinism between physiological states, cognition, behavior, and environment (Bandura, 1986), some researchers have examined the interactive relationship between these four areas more systematically (McAuley & Courneya, 1993). Several examples exist in the exercise adherence literature including altering the environment to make exercise behavior more likely, increasing self-esteem cognitions via exercise, and behavioral contracting to increase exercise participation.

McAuley (1992) suggested that an underresearched area within exercise adherence is the potential mediating function of cognitions between the other three components of self-efficacy theory, namely physiological states, behavior, and environment. His argument for greater research examining these interactions comes from the success of behavioral medicine to show that efficacy cognitions mediate preventive health behaviors such as smoking cessation and weight loss.

In self-efficacy theory one environmental component that has been researched, yet one that is still not well-understood in its role in exercise adherence, is the factor of social support (Rejeski, 1992). In self-efficacy theory, social support is included in the environment as a potential determinant of some behavior or cognition (Bandura, 1986).

Its role in exercise behavior is just beginning to be investigated by some researchers as a mediating factor between cognition and exercise adherence (Duncan, 1989; Duncan & McAuley, 1993).

Bandura's Social Cognitive Theory (SCT) (Bandura, 1977; Bandura, 1986) has become one of the most successful predictors of exercise adherence. According to SCT, behavioral changes are mediated by the cognitive precept of self-efficacy. SCT states that self-efficacy can be learned in different ways, including modeling and personal experience. The main premise of Bandura's theory, reciprocal determinism, states that environmental, physiological, behavioral, and cognitive factors all interact and are determinants of one another.

SCT acknowledges two kinds of expectations, self-efficacy and outcome (Bandura, 1986). The expectation of outcome is one's judgment that a behavior will lead to certain outcomes. An expectation of self-efficacy is the belief that one can perform the behavior successfully so that the desired outcome will be produced. The expectation of self-efficacy is a stronger determinant of behavior than the expectation of outcome, but there are situations when both are central to execution of a behavior (Bandura, 1986).

The effects of social support on exercise adherence have only recently been examined with the added concept of self-efficacy (Duncan, 1989; Duncan & McAuley, 1993). Results from these studies have shown promise in the explanation of

exercise adherence. Several studies have suggested that efficacy cognitions and social support are not independent of each other in influencing healthy lifestyles and overall well-being (Cutrona & Troutman, 1986; Holahan & Holahan, 1987).

Self-efficacy has been shown to be a key factor in individuals' abilities to alter their health habits and behaviors such as weight loss and addiction (O'Leary, 1985). In addition to self-efficacy, individuals also show "self-influence" (McAuley, 1992, p.6) over their own behavior by joining self-help and support groups to assist in the maintenance of these behavioral changes. However, little is known about how individuals' self-referent thoughts (i.e., self-efficacy) and the use of their outside resources such as social support interact to maintain a behavioral change.

Overall, the use of social support as well as the concept of self-efficacy have not been well-researched in the area of exercise adherence. The interaction of social support with self-efficacy is even less understood and researched (McAuley, 1992). Therefore the present study is being proposed to expand the knowledge base in the area of exercise adherence.

The theories mentioned previously (Health Belief Model, Protection Motivation Theory, Theory of Reasoned Action, Theory of Planned Behavior, and Theory of Interpersonal Behavior) also have the common component of social support, but it is not emphasized, and is often overlooked within each of these separate theories. Though rarely measured in studies utilizing these theories, the social cognitive mechanism of

social support is acknowledged, but it is often clustered with demographic variables, and not singled out or separated as having any unique influence on exercise adherence.

For example the Health Belief Model includes social support as a social psychological variable that may modify behavior. However, it is not of primary importance to the determination of whether there is a perceived threat causing one to alter or include a new health-related behavior. Protection Motivation Theory, which bears resemblance to the Health Belief Model, has little to say about the potential importance of social support as a main factor to consider in exercise adherence (Soenstrom, 1988).

The other prominent theories in exercise adherence reviewed by Godin and Shephard (1990) such as The Theory of Reasoned Action (Fishbein & Ajzen, 1975), the Theory of Planned Behavior (Ajzen, 1985), and the Theory of Interpersonal Behavior (Triandis, 1977) all have a little more to say about the use of social support in the maintenance of a behavior. In the Theory of Reasoned Action, the influence of social factors is seen as one of many determinants of the intent to begin a behavior. That is, social support is seen as the beliefs of significant others concerning the participant's exercise behavior and motives to adapt to these beliefs (Fishbein & Ajzen, 1975).

The Theory of Planned Behavior (Azjen, 1985) views the social aspect of one's life in much the same way, namely, that social factors like social support are determinants of one's

intention to adopt a behavior. The theory supports the idea that people will behave according to their intentions, so if an intention to exercise is present, an individual is more likely to exercise than if the behavioral intention to do so does not exist. Similarly, according to the Theory of Interpersonal Behavior (Triandis, 1977), the social aspect is one of four components that determines intention, which then influences performance of a behavior. That is, social psychological motives for exercise participation come from social norms and role expectations that people have about themselves and perceive that others have of them.

While these theories - that have all been used to examine exercise adherence - include a social component in some way, social support is not viewed as a crucial separate entity that needs the focus as does, say, intention, in the decision to maintain an exercise regimen; nor do the theories view social support in quite the same way. Rather, the social element in each of these theories seems to affect intention, which in turn, affects actual performance of a behavior. Or, as in the Health Belief Model (Becker, 1974), the social variable is merely one of many demographic variables that seem to have some relationship with adherence, but there is no elaboration of its potential importance for maintenance of exercise behavior.

Social support, though, is generally seen as one of many determinants of exercise. In a review by Dishman, Sallis, and Orenstein (1985), many factors are listed as being

instrumental in exercise participation. The authors first consider social support with supervised exercise programs. In this section of the review, social support is called an "environmental characteristic," and is in the form of spouse support and social reinforcement from staff or an exercise partner. In spontaneous physical activity, social support is called an environmental characteristic subsumed under family and peer influences. In both types of physical activity, supervised and spontaneous, these environmental characteristics were seen as having a positive effect on adherence to the behavior. The writers call for further study of the interactive effects of personal and environmental factors that determine a person's adherence to physical activity.

The existing literature in exercise adherence shows some commonality among theories in that two variables, i.e., social support, an environmental factor, and self-efficacy, a personal factor, are generally included in the theories in one way or another. It is not surprising, then, that researchers have recently begun to see the potential of examining the interactive effects of these two variables on exercise adherence, as well as the unique contributions that each makes, and that writers discussing the field have suggested this direction of research (McAuley, 1992). The role of social support in exercise adherence has been called a "promising area of study" (Rejeski, 1992, p. 155), yet one that is still not well understood.

In the early studies in this field, social support was defined as merely a supportive attitude of significant others toward the person participating in physical activity. In reality, though, social support is more varied and multidimensional (Cohen & Syme, 1985; McAuley, 1992). That is to say, social support should no longer be viewed as a simple, unidimensional construct (Rejeski, 1992). For example, Rejeski (1992) suggested using Cohen's (1988) work on social support as a foundation for examining the multidimensionality of social support. Cohen (1988) stated that social support may have several buffering effects such as providing information for people, increasing self-esteem, providing pressure to maintain motivation for a particular behavior, and providing tangible resources that help with coping skills that are used when adopting a new behavior.

Much effort has been given to determine and confirm the beneficial effects of social support on health and well-being, but there has not been much work done to determine how social support influences health and well-being (Heller, Swindle, & Dusenbury, 1986). In addition, there has not been much research in examining what type of support is being provided or what type is best in specific settings (Cohen & Syme, 1985).

The study of social support and its effects on the adherence to health-related behaviors is not new. However, an agreement on the exact definition of social support is still lacking (Shumaker & Brownell, 1984). Typically, the use of

the term has been with a broad application, but investigations have generally focused on existing social support within an individual's life.

To help with the definition problem, Cohen (1988) suggested distinguishing between structural and functional support measures. Structural support refers to the "existence and interconnections between social ties." That is, the existing network of relationships constitutes the structural support within a person's life. Functional social support refers to the assessment of social connections in terms of the functions they may or may not be serving a person, such as providing a sense of belonging or material goods.

There are also a number of models that have been used to further structure the field of social support. Cohen (1988) labeled models according to whether they were instrumental in relieving stress, or whether they help predict the influence of social support regardless of the stress level of the individual. He calls them "stress-buffering" and "main-effect" models, respectively.

The main effects model includes information-based, self-esteem, tangible-resource, and social influence (Cohen, 1988). The information-based model refers to the idea that information may impact health-related behaviors by making sure people have access to information that may help them avoid a stressful and/or high-risk situation. For example, providing information to pregnant women about the deleterious effects of drinking alcohol and smoking during pregnancy may help them

deliver healthy babies and avoid the life-long stress of having a baby with fetal-alcohol syndrome.

Self-esteem models are those that prescribe to the notion that the existence of social support increases self-esteem and helps strengthen self-identity, which in turn may result in improved health. The social integration of people helps develop an overall positive affect and a sense of stability, along with a feeling of self-worth. These positive self-states may result in an increased motivation for people to care for themselves physically and psychologically (Cohen & Syme, 1985).

The tangible-resource model assists presumably in the improvement of health via actual material goods such as food, clothing, and housing (Cohen, 1988). These provisions could help lessen exposure to health risks and disease. An example of this is the vaccinations that are provided free-of-charge by many public health departments throughout the country.

The last type of main-effect model of social support is social influence (Cohen, 1988). The premise here is that individuals are "subject to social controls" and peers who will likely influence "normative health behaviors." These health behaviors may include improved eating habits, not smoking, moderate or no alcohol intake, and exercise.

There is not much research that has examined the link between social support as a social influence model and health-related behavioral change, although some support does exist. Positive, supportive behaviors from a spouse has been related

to quitting smoking (Mermelstein, Cohen, Baer, & Kamarck, 1986), and in a 30-month study of older adults, positive changes in self-care were significantly related to outside social influence and support (Blazer, 1982).

As mentioned previously, Cohen's (1988) work on social support also discusses social support as a stress-buffering mechanism. A new exercise program may cause participants stress, because it is a new activity, or people may be reluctant for others to see their bodies, and/or there may be a fear of looking foolish in front of others. If this is the case, social support for exercise programs could be classified as a stress-buffering effects model, not just a main-effects model. Cohen argues that the buffering effects of social support could once again be to provide information, this time with a realistic appraisal of the stressor and/or to improve individuals' coping ability. Social support could also increase self-esteem and the level of perceived control, act as pressure to motivate one to conform to a healthy behavior, and to offer tangible resources that also help with coping behavior (Rejeski, 1992).

In the social support literature, researchers have questioned the stress-buffering model, stating that it is at once too complex and too simplistic. It is too complex in that a specific buffer effect is difficult to specify, and too simplistic in that little is known about what might cause social support to be effective (Vaux, 1988). Therefore, it seems appropriate to classify social support used in improving

exercise adherence as a main- effects model within Cohen's (1988) schema, and to view social support from a functional perspective. The functional perspective assesses the relationships of individuals and how these relationships serve particular functions, such as providing a sense of belonging, giving attention, or providing education. Social support will be treated in this study, then, primarily as a functional construct within the main-effects model suggested by Cohen (1988).

Weiss (1974) has identified six categories of "relational provisions" (Weiss, 1974, p. 23) that are typically connected with a specific type of relationship and fit well into the functional perspective of social support. However, in this study, social support will be manipulated, so these categories may apply in several ways to the types of social support provided in the study.

Weiss (1974) noted that the level of importance of these provisions varies over an individual's lifetime, and some may never be crucial to some people. The first provision is attachment, and serves the main purpose of providing security and/or belonging. Relationships that provide attachment include marriage, a close friend, or a close relative. Social integration is another provision. Relationships that provide social integration are characterized by people who are sharing common concerns and experiences, and thus, are also providing social opportunities and information of interest to each other. A third provision is opportunity for nurturance.

Relationships where one can feel needed and able to take some responsibility for another are indicative of nurturance. Reassurance of worth is the fourth provision and can come from work colleagues or from the home, anywhere where a feeling of competence will be fostered in an individual. A sense of reliable alliance is the fifth provision. According to Weiss, this provision is obtained primarily from relatives, or any relationship where there is unconditional and ongoing assistance, regardless of the existence of any mutual affection. The last provision is the obtaining of guidance. Weiss has noted that this is especially important to those who are in stressful situations. It is at these times when one will seek someone who is in authority, yet trustworthy and able to provide emotional support, as well as a plan to be used during the stressful time.

Based on examination of the literature in exercise adherence, social support will be structured by the researcher. Three different types of social support have shown promise in improving exercise adherence, and were incorporated into the present study.

One social support intervention was relapse-prevention. This model has come from the substance abuse/addiction literature and has recently been applied to other health-related behavioral changes such as exercise. The procedures used in this intervention were similar to the relapse-prevention design implemented by Belisle, Roskies, and Levesque (1987).

The second type of social support intervention used was the buddy-system. The buddy-system has been used successfully in a corporate fitness setting. Results from the corporate setting study showed that having a "buddy" was an effective way to reduce anxiety in the beginning of an exercise program and to encourage ongoing participation in an exercise program (Hobson, Hoffman, Corso, & Freismuth, 1987). In a study that compared the effects of social support and external rewards on exercise adherence, members os a "buddy" group had better attendance rates than those members who did not receive support (Kravitz & Furst, 1991).

The third type of social support intervention used in the present study was telephone contact. The use of telephone contact has been shown to be successful in facilitating adherence to an exercise regimen. In a study designed to increase adherence to a home-based exercise program, subjects who received regular telephone calls designed to support and encourage, had better peak oxygen uptake at the end of the assessment period than those who did not receive telephone calls (King, Taylor, Haskell, & DeBusk, 1988).

Social support, then, is no longer viewed as a unidimensional construct, but rather a complex phenomenon, something that is likely to affect behavior, as well as be influenced itself (Rejeski, 1992). Researchers (e.g., Duncan & McAuley, 1993; Rejeski, 1992) have begun to theorize that the effectiveness of social support comes from its interaction with other variables. A promising addition to this

theoretical direction of social support research has been Bandura's (1977) concept of self-efficacy. Thus, the present study looked to examine the constructs of social support and self-efficacy together, to better understand their effects on exercise adherence.

Definitions

The primary constructs used in this study have been defined in many ways. Controversy in the literature exists for each variable. The definitions chosen for this study are based on a review of the theory and the purpose of this study. Therefore, these definitions may not be applicable to other studies that utilize these variables.

Social Support. This study will use the definition of social support offered by Cohen (1988). Social support will be treated here as a multidimensional construct that is primarily functional in nature and thus, defined by the functions the social support serves in any specific situation. Social support often has many purposes in situations and this will be the case for exercise adherence. Social support will be seen as assistance from others in the form of information-giving, social influence, providing tangible-resources, and increasing self-esteem (Cohen, 1988).

Self-Efficacy. The definition of self-efficacy will be based on the definition provided by Bandura (1986). Bandura defined self-efficacy as a confidence necessary to perform a behavior that will lead to a certain outcome. In this study self-efficacy will specifically refer to individuals' beliefs

that they can successfully regulate their own behaviors (Duncan, McAuley, Stoolmiller, & Duncan, 1993).

Adherence. The definition of adherence has a history of confusion and vagueness in the literature of adherence to health-related behaviors. Some studies use the term "compliance," but because this can denote a coercive factor (Dishman, 1988), the term adherence will be used. Adherence in the health-related literature has been defined as maintenance of a behavior demonstrated by the regular and faithful performance of the behavior. In this study, adherence will mean the regular and faithful performance of an exercise behavior.

Exercise. In the present study, exercise will refer to physical aerobic activity in which the possibility of sustaining a target heart rate over a sustained period of time is present. In addition, exercise will refer to structured and supervised physical activity that is performed in a group setting. This definition excludes anaerobic physical activity such as weightlifting and sprinting.

Need for the Study

Given the high prevalence of sedentary and at-risk people in the United States, and the inadequate knowledge base regarding social support in exercise programs, research into the use of social support and its interaction with self-efficacy is needed. Further, our population continues to invest millions of dollars each year in aerobic and anaerobic exercise programs, yet we are still a nation of "exercise

dropouts." That is, despite our initial good intentions, we have not become healthier or any more fit, quite possibly because of our lack of adherence to the programs that will make us healthier. Between 30% and 59% of our adult population continues to lead a sedentary lifestyle (Casperson, Christenson, & Pollard, 1986). The most significant problem plaguing exercise programs is adherence (Dishman, 1988).

Although the health benefits are well-documented, the reported drop-out rate in supervised exercise programs is still around 50% for programs around the world (Dishman, 1990). Dishman (1990) approximated the dropout rate of exercise programs to be close to 50% within the first six months. Because fitness requires exercise of some type, and many seem to choose supervised exercise regimens or programs as a preventive health behavior, attrition is a significant problem (Pollock, 1988).

The effects of various kinds of social support interventions have not been adequately tested in exercise adherence. Little is known regarding the amount, kind, or frequency of social support and exercise. In addition, very few studies have tied social support theory to the use of it in an exercise setting.

The present study will contribute to the research base of exercise adherence regarding perceived and actual social support, participation, and the interaction of self-efficacy and social support. This study will also contribute to the knowledge base of health behavior research by providing an

empirical analysis of the role of social support in a health behavior change arena.

Purpose of the Study

Because there are many types of social support that could presumably affect exercise adherence, and because individuals differ on their level of self-efficacy, the purpose of this study is threefold: First, to investigate the role of three kinds of social support in exercise adherence, secondly, to investigate the role of self-efficacy in exercise adherence, and thirdly, to examine the interaction between social support and self-efficacy in exercise adherence. Specifically, the purpose is to determine the individual effects of social support and self-efficacy and the effects of their interaction on exercise adherence in a supervised exercise program.

General Hypotheses of the Study

The primary hypotheses of this study revolve around the effects on exercise adherence derived from giving participants varied types of social support, ranging from relapse prevention (most support), to telephone contact (least support). The four groups for this study will be identified as: 1) meeting group (relapse-prevention), 2) buddy system, 3) telephone contact, and a no support or control group. The influence of self-efficacy on adherence as well as its interaction effects with social support on exercise adherence will also be investigated. In general terms, the research hypotheses are as follows:

1. The types of social support will have an effect on

attendance at a structured exercise program. Specifically, the relapse-prevention form of social support is hypothesized to lead to the highest attendance rates; the buddy-system will have the second-highest attendance rates; and telephone contact will have the third-highest attendance rates. The difference in attendance between the relapse-prevention group and the control group will be statistically significant.

2. Self-efficacy will have an effect on adherence to a structured exercise program. Specifically, the greater the reported level of self-efficacy, the greater the adherence to the exercise program as measured by attendance.

3. There will be an interaction effect between social support and self-efficacy. Specifically, subjects who have a higher level of self-efficacy and also receive social support will have greater exercise adherence than those with lower self-efficacy. Also, the greater the level of social support, combined with higher self-efficacy, the greater the adherence to the exercise program.

Overview of Remaining Chapters

In Chapter Two, the relevant literature is reviewed in the following areas: behavior change theories and exercise adherence, self-efficacy and exercise adherence, social support and compliance to health-related behaviors, including exercise, and other determinants of exercise adherence. The research design and procedures are presented in Chapter Three. In Chapter Four, the results and analysis of results are presented. Summary and conclusions of the study, as well as

recommendations for future research are presented in Chapter Five.

Chapter Two

LITERATURE REVIEW

Introduction

There are many theories, models, and interventions that have been applied to the area of exercise adherence. The following literature review represents the most current research and the subsequent breakthroughs and limitations of the theories. The first part of the review will discuss studies utilizing specific theories and behavioral interventions that have been used to explain adherence behavior. This discussion will lead to the conclusion that social support is a viable factor in the promotion of exercise adherence, and thus, should be studied more systematically.

Next, exercise adherence studies that have investigated the applicability of self-efficacy in exercise adherence will be examined. Finally, the effect of the potential interaction between self-efficacy and social support on exercise adherence will be discussed. In summary, research is presented in order from least relevant to most relevant to the proposed study.

Exercise Adherence - Major Theoretical Perspectives

Health Belief Model and Adherence

The Health Belief Model (HBM) (Becker & Maiman, 1975) was one of the earlier theoretical models used to examine compliance to preventive health behaviors. There are three main assertions in this model. The first assertion is that

compliance depends on the perceived vulnerability to a health problem or disease or the perceived severity of it. If one does not perceive a threat exists, the preventive behavior will not be adopted. The second assertion is that the relationship between the preventive behavior and the difficulty in the adoption of the behavior affects adherence. This has also been termed the "perceived benefit" versus the "perceived barrier" to "preventive action." For example, if a college student wants to stop drinking, the potential benefit is more time devoted to studying. But the student may feel the cost is too high, if drinking is the main source of socializing. The last component of the HBM is external or modifying factors that may motivate the person to comply with a preventive health behavior. This last assertion has three kinds of variables: demographic, sociopsychological, and structural. The demographic variables include age, sex, and ethnicity. Sociopsychological variables include social class, social support, and social pressure. Structural variables are factors such as prior knowledge of the disease or health problem, and prior contact with the problem.

Much research has been generated in preventive and sick-role behaviors using the HBM, although not much has been conducted since the middle 1980's. Janz and Becker (1984) reviewed 46 studies that used the HBM and found excellent support for the model. The "perceived barriers" component was the most useful in explaining the variance in exercise adherence. For preventive health behaviors, perceived

vulnerability has the most predictive utility. "Perceived benefits" and "perceived severity" accounted for the most variance in studies of sick-role behaviors.

Unfortunately, the HBM has not shown as much predictive utility in adherence to exercise research. Slenker, Price, Roberts, and Jurs (1984) tested the HBM to predict jogging behavior. Results indicated that "perceived barriers" to jogging were the best predictors of jogging behavior and accounted for 40% of the variance. However, perceived vulnerability to health problems or disease was not a good predictor of jogging behavior. Both joggers and sedentary subjects believed that regular jogging decreased vulnerability to health problems.

The HBM may have several limitations that make it less than appropriate for understanding exercise adherence. One is that there are no reliable and valid measurement instruments that are theoretically based on the HBM. Another limitation is that the HBM was designed to predict one instance from a specific behavior, whereas exercise adherence theories should ideally predict from ongoing behavior. Participation in exercise includes many behaviors over extended periods of time. What has been suggested as the biggest shortcoming of the HBM is that its theoretical base to explain the adoption of preventive behaviors is an avoidance of illness (Sonstroem, 1988). The theoretical focus on avoidance of illness does not allow for the investigation of many other variables that could contribute to one's decision

to enter into or maintain an exercise regimen.

Theory of Reasoned Action and Adherence

The Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975) is an attitudinal model that predicts behavior based on a person's intentions. A main assumption is that people behave in rational ways. Thus, they are able to make informed decisions about their own behaviors.

A person's behavioral intention is influenced by any perceived social pressure ("subjective norm") to perform the behavior as well as an individual's own attitude about performing the behavior. The attitude a person has about a particular behavior is based on beliefs about the consequences of performing a behavior and an evaluation of those consequences. Thus, attitude is an interaction of a person's belief and a person's evaluation of the consequences that may result from a behavior.

The relative importance of the two components that determine behavioral intention, subjective (or social) norms and attitudes, is believed to vary by situation as well as by the specific behavior and the individual (Fishbein & Ajzen, 1975). Depending on the importance of these attitudes and subjective norms, an individual develops an intention to perform or not perform a particular behavior. A behavior is performed because the individual believes that to do so is of greater benefit than to not, and/or there is a belief that significant others want the behavior to be performed. The intention to perform the behavior is the linking factor

between attitude and behavior, that is, if a person intends to adopt a behavior he or she will do so, and if the intention is negative he or she will not perform a behavior (Fishbein & Ajzen, 1975).

The evaluation of the Theory of Reasoned Action in exercise settings is somewhat inconclusive, although many have found it to be quite useful. Several reviewers have reported varying degrees of usefulness of the TRA model to exercise adherence research (Godin, & Shephard, 1990; McAuley & Courneya, 1993; Sonstroem, 1988).

The first application of this theory was in a survey study of joggers and nonexercisers (Riddle, 1980). Two weeks after surveys were completed, the subjects were telephoned and asked if they had jogged on a regular schedule since completing the survey. The correlation between intention to jog and actual jogging was .82. Overall, intention explained 67% of the variance. In addition, subjective norms and attitude toward the behavior were also predictors of intention, with attitude slightly more significant statistically.

Subsequent studies of the TRA have not been able to reproduce the findings of these initial studies. In a study of university employees, intention was used to predict leisure-time physical activity over a two-month period (Godin, Valois, Shephard, & Desharnais, 1987). The connection between attitude and intention was significant, but the link between subjective norm and intention was not. Overall, intention

explained 47% of the variance in physical activity during the two months.

In another study that investigated the intention to engage in leisure-time exercise, the variance was largely unexplained (Godin & Shephard, 1985). Couples completed questionnaires that asked them questions about their intention to exercise, attitudes toward exercise, and current activity level. In this study, only 49% of the variance in intentions to exercise was explained for the men, and only 27% of the variance was explained for the women. Attitude was the only variable that was predictive of exercise intentions for both men and women. Other factors such as socioeconomic status of the family and current activity level also affected intention, but were not significant. The men were influenced by factors such as family and spouse, factors that are related to subjective norms, while the women in the study were not.

A study of lower limb-disabled adults' exercise behavior over a one-week period found much less support for TRA (Godin, Colantonio, Davis, Shephard, & Simard, 1986). Results showed that intention explained only 23% of the self- reported exercise behavior of the subjects. Also, attitude was a significant predictor of intention (albeit a weak one), and subjective norm was not a significant predictor.

The Theory of Reasoned Action has drawn criticism because it is essentially an additive model of behavior prediction (Sonstroem, 1988). If exercise is mediated by other factors and the relationships are not linear in nature, this raises

questions about the validity of this model. While behavioral intention has been found to be predictive of exercise behavior, attitudes have also been predictive of physical activity and may affect intention because of other mediating factors such as perceptions of self including an individual's ability to perform a behavior such as exercise. In a review of theories used to investigate exercise behavior, Rejeski (1992) noted that most studies utilizing TRA were only able to account for small percentages of the variance in exercise behavior. Rejeski (1992) also commented that the predictive ability of the TRA could be strengthened by including mediating factors such as self-efficacy.

The Theory of Reasoned Action has also been compared to other theories in studies of exercise adherence. These will be discussed within the reviews of the other theories in this chapter.

Theory of Interpersonal Behavior and Adherence

Triandis' (1977) model extended the Theory of Reasoned Action by adding additional factors that influence the decision of whether or not to engage in a behavior. He postulated that three main influences affect the likelihood that a behavior will occur: 1) the intention to perform the behavior, 2) the situation or conditions that may encourage or discourage the performance of a behavior, and 3) the habit of performing a behavior. The habit factor and the strength of this habit were the most significant factors added to the Theory of Reasoned Action by the Theory of Interpersonal

Behavior. If a behavior is relatively new, then, intention is more important, but when the behavior becomes more repetitious, the habit factor may be the stronger determinant of the behavior, while still being coupled with the conditions which may or may not facilitate the performance of it.

The Theory of Interpersonal Behavior has also provided other factors not included in the Theory of Reasoned Action. These additional factors may help to explain an individual's intention to perform a behavior. These additional factors are a cognitive factor, a personal normative belief factor, an affective factor, and a social factor (Triandis, 1977).

The cognitive factor is very similar to the cognitive construct in TRA, in that it includes the value assigned to the perceived consequences of engaging or not engaging in a behavior. The personal normative belief factor is independent of cultural influences, and refers to an individual's level of obligation that a behavior should be performed. The affective factor is any emotion or feeling brought on by the thought of engaging in a behavior, as well as feelings that are felt during the actual performance of a behavior. The affective factor may be influenced by past feelings experienced during previous performance of behavior (Triandis, 1977).

Finally, the social factor consists of the relationships that one has with others. This is divided into role and normative beliefs. Role beliefs are the extent to which a person believes it is appropriate to engage in a particular behavior given the person's place in society, while normative

beliefs are personal beliefs that a behavior is an appropriate activity in which to engage. The conclusion made by the Theory of Interpersonal Behavior is that both role and normative beliefs are influenced by the culture and environment (Triandis, 1977).

There has not been a great deal of research in the exercise behavior literature utilizing the Theory of Interpersonal Behavior. Though the work that exists has been somewhat successful in explaining health-related behaviors, including exercise (Godin & Shephard, 1990), the Theory of Interpersonal Behavior does not contribute significantly to the explanation of exercise adherence as a unique and distinct theory. However, several studies have tested portions of the theory and have found that habit and affective states are important variables to include in studies of exercise behavior and adherence (Godin, Valois, Shephard, & Desharnais, 1987; Valois, Desharnais, & Godin, 1988; Valois, Shephard, & Godin, 1986).

Triandis' model and the Theory of Reasoned Action were compared in a study of university employees (Valois, Desharnais, & Godin, 1988). Subjects were asked to report how often they exercised for at least 20 minutes over a three week period. From the Theory of Reasoned Action, the intention to exercise explained 32% of the variance. The model of interpersonal behavior explained 33% of the variance. These researchers also noted that it was an affect component, not a cognitive one, that helped explain the variance in intention

in Triandis' model. They suggested that the emotional component of attitude should be a prime area for intervention in promoting health-related behaviors. Because of this finding, the present study will include questionnaire items that help determine the affect, particularly enjoyment, that subjects may feel toward exercise.

Another important finding of this study was that in Triandis' model, the social component was significantly related to intention, even though this social aspect was not related to intention in the theory of reasoned action. Valois, Desharnais, and Godin (1988) suggested that because of this, social concepts such as role expectations and normative beliefs may be strong predictors of exercise intentions.

An overall evaluation of the Theory of Interpersonal Behavior concluded that the theory may not be appropriate for studying exercise behavior (Rejeski, 1992). This conclusion was reached despite the acknowledgement that the factors added to the theory of reasoned action, namely, the importance of past behavior (habit) and affective reactions seem to add a great deal to the original theory. Rejeski (1992) cited the fact that Triandis' (1977) original framework was designed to understand interpersonal behaviors. A recent review (Godin & Shephard, 1990) called for further consideration of these factors in exercise adherence research. However, the majority of constructs are difficult to define operationally, and to conceptualize in an exercise framework. Overall, the Theory of Interpersonal Behavior does seem to be more relevant to the

study of interpersonal behavior in relationships and not to health-related behaviors (Rejeski, 1992).

The Theory of Planned Behavior and Adherence

Ajzen (1985), one of the original authors of TRA, extended the theory of reasoned action by adding the factor of perceived behavioral control. Whereas the Theory of Reasoned Action assumes that behaviors are under complete control of the person, Ajzen suggested that behaviors are realistically under varying degrees of control. If an individual has somewhat limited control over a behavior, Ajzen suggested evaluating the person's perceived control over that behavior, along with the intention to perform the behavior. This concept is quite similar to Bandura's (1977) self-efficacy concept which will be discussed later in this review.

The Theory of Planned Behavior posited that the more opportunities and resources individuals believe they have, the less likely they are to feel there are barriers to the performance of a behavior. Ultimately, this feeling of control interacts with an individual's attitude toward the behavior and subjective norms to determine whether or not a behavior will occur (Ajzen, 1985).

This theory has received little attention in the context of exercise. However, in a study conducted by Schifter and Ajzen (1985), perceived control was a strong predictor of subjects' intentions to lose weight as well as amount of weight lost. In a survey of college students, Ajzen and Timko (1986) found that the level of perceived control over

health-related behaviors was associated with subjects engaging in specific behaviors. These studies suggest that the Theory of Planned Behavior be considered in future research on exercise adherence (Willis & Campbell, 1992).

Protection Motivation Theory and Adherence

Aspects of Protection Motivation Theory (Rogers, 1983) are similar to the Health Belief Model discussed earlier. Protection Motivation Theory (PMT) was originally developed to examine coping styles of people who were in danger or a threatening situation (Rogers, 1975). Rogers originally suggested that the intention to protect oneself is influenced by three factors: 1) perceived vulnerability to the threat, 2) perceived severity of the threat, and 3) belief that a preventive behavior will prevent the threat from occurring. A few years later, Maddux and Rogers (1983) incorporated the concept of perceived self-efficacy into the Protection Motivation Theory framework as another cognitive mediator.

PMT was applied to female college undergraduates' exercise behavior (Wurtele & Maddux, 1987). The students were asked to read persuasive information about the reasons for increasing exercise and avoiding a sedentary lifestyle. Results showed that perceived self-efficacy and perceived susceptibility to cardiovascular disease increased intentions to exercise. Perceived severity of disease did not affect intentions. Moreover, the only factor that did significantly predict actual exercise behavior was intention. The authors concluded that self-efficacy was the main variable that

predicted exercise behavior, rather than the variables put forth by the PMT.

One study looked at the effect of physical fitness evaluations on the intention to exercise (Godin, 1983). While this was not a direct study testing Protection Motivation Theory, it was a test to determine if persuasive communication might increase perceived susceptibility and thus, increase the level of intention to exercise. When physical evaluation along with health and exercise counseling was provided for subjects, the intention to exercise was not changed in those who had decided for themselves to go to an athletic center for fitness evaluation. Godin concluded that persuasive communication could affect an individual's intention to change a behavior, but that this communication was not as helpful in eliciting a behavior or sustaining a behavior over a longer period of time.

In a follow-up study using the same subjects, the researchers (Godin, Desharnis, Jobin, & Cook, 1987) found that the subjects who had had fitness evaluations demonstrated greater intention to exercise over the next three months, but that after this period, the positive influence of the fitness evaluation diminished. Subjects who had fitness evaluations no longer showed a stronger intention to exercise than those who did not have the evaluation.

Currently, the PMT seems to be limited in its usefulness for exercise adherence research. The positive findings associated with this theory are believed to come more from the

addition of the self-efficacy construct than from any of the factors postulated by protection motivation theory (Godin & Shephard, 1990)

Attribution Theory and Adherence

Weiner (1985) suggested that the attributions provided for outcomes and events in our lives impact our decision for future behavior by mediating our affective responses and expectancy beliefs. Three dimensions of causality have been demonstrated to affect causal attributions: 1) stability, 2) controllability, and 3) locus of causality. In other words, affective responses result from cognitive processing that occurs regarding an event.

McAuley (1991) examined the relationship between causal attributions and efficacy cognitions for exercise behavior and the affective responses that are generated from the attributions. During the tenth week of an exercise program, middle-aged subjects who had been sedentary prior to the program were tested. With more frequent exercise, perceived progress through the exercise program was attributed more often to stable and personally controllable causes. People with greater self-efficacy also attributed progress to personally controllable causes. The three dimensions of causality were all related to more positive affect, and self-efficacy had a significant effect on this positive affect.

McAuley (1991) suggested that once participants have been exercising for several weeks - that is, past the adoption

phase - the exerciser views progress made as stable and controllable. In addition, the exerciser's affect becomes more positive and leads to a greater chance of adherence to the exercise program. He suggested that the findings demonstrate that self-efficacy is the mediating factor between the causal attributions for progress and the subsequent affect regarding that progress.

Cognitive Behavioral Strategies and Adherence

Studies of exercise adherence that incorporate some type of cognitive behavioral intervention number in the hundreds and continue to increase. This is evidence of the strong interest of these theories in the exercise adherence domain. However, the studies to be reviewed here are representative of the research that looks at behavioral interventions only, and not in combination with any other concept or theory. That is, studies that have utilized concepts such as self-efficacy along with other variables will be discussed later in this review.

In a recent review, Dishman (1991) discussed the positive outcomes that have resulted from the use of behavioral change strategies in exercise adherence. However, he mentioned that because most of the studies have used quasi-experimental or non-experimental methodologies, the cause-and-effect relationship remains unanswered. Behavior modification and cognitive-behavior strategies are potentially very useful, but overall, their effectiveness still remains unclear.

Dishman (1991) concluded that many different strategies

are effective, especially environmental controls such as easy access to the exercise site and removing perceived barriers. He also noted that studies utilizing such interventions as goal-setting, self-monitoring, and self-reward are useful methods of increasing exercise maintenance.

In a study designed to test the efficacy of contract and lottery procedures, female college students were assigned to either a lottery group, a contract group, or a no-treatment control group (Epstein, Wing, Thompson, & Griffin, 1980). Subjects who were in the lottery or the contract group attended exercise classes more regularly. This was despite the fact that the treatment groups differed on the amount of work required. Also, there were differences in changes in fitness. The subjects in contract groups that required the most running showed the most fitness improvement when tested via a 12-minute running test.

Self-monitoring was used in a study that compared a self-monitoring only group, a self-monitoring/additional staff attention group, and a no treatment control group (Weber & Wertheim, 1989). The subjects were all women who were members of a private health club. The self-monitoring intervention lasted 12 weeks. The self-monitoring group had better attendance than the control group. The self-monitoring/additional staff attention group was not statistically different from either the self-monitoring only group or the no treatment control group. In describing this study, Rejeski (1992) noted that in a self-monitoring poster

used in the study, a cartoon suggesting that a trip to the gym is enjoyable was shown. He suggested that stimulus control may have been a contributing factor in adherence rather than just self- monitoring.

Behavioral strategies were also used with patients who had a history of vascular headaches (Fitterling, Martin, Gramling, Cole, & Milan, 1988). Although there were only 5 patients, four had actual reductions in vascular headache activity after participating in regular physical activity. An entire behavioral plan was used with these patients. First, instruction and modeling were used to explain and show aerobic training methods. Behavioral contracts were then used to designate contingencies for exercise adherence. The subjects and their significant others were also given training in stimulus control. For instance, they were told to put out exercise clothes prior to the day their exercise class was scheduled. Personalized praise and feedback was also a behavioral method used with these subjects, along with cognitive training that included thought-stopping and positive self-talk. Overall, this study represents one of the more complete and experimentally rigorous studies in the use of behavioral strategies on exercise adherence.

Dishman (1991) noted in a recent review of behavior and cognitive-behavior interventions for exercise adherence that studies utilizing these interventions have generally shown an improvement in adherence rates. However, he stated that because of limited internal and external validity along with

quasi-experimental designs in most of these studies, no strong conclusions about the effectiveness of behavioral and cognitive-behavioral interventions could be made. Dishman called for more research using behavioral and cognitive-behavioral interventions, but suggested they be studied with environmental and social factors since these have also been found to be important determinants of exercise adherence.

Social Support and Adherence

Although the study of exercise adherence has increased tremendously over the last several years, social factors such as social support have not received the same attention that has been given to individual or exercise program factors (Willis & Campbell, 1992). Several researchers have called for more studies that would examine the effects of social support on exercise adherence (McAuley, 1992; Rejeski, 1992; Wankel, 1988).

The domain of social support has always been quite broad in that social support has been defined in a variety of ways, and these definitions have all been accepted in one context or another. Social support is sometimes defined operationally as the number of overall social relationships for an individual, relationships of a specific kind (such as number of close female friends), or membership in organizations. Social support is also sometimes viewed as the structure of a person's relationships or the functions various relationships have in a person's life. The functional content of social support is the most frequently researched aspect of social

support (House & Kahn, 1985).

Despite the almost common sense notion of social support, relatively little systematic research in the area of exercise adherence has used this theoretical perspective. In manuals for fitness instructors and books that describe how to develop successful exercise programs, there are frequently various tips included pertaining to promoting social support among the participants (Rejeski & Kenney, 1988). However, there is much less empirical data about the efficacy of these social support suggestions and if certain kinds are more successful than others (Wankel, 1988).

A study by Wankel, Yardley, and Graham (1985) provided one of the few assessments of social support and exercise adherence. In two studies, subjects were separated according to their level of self-motivation using the Self-Motivation Inventory. In the first study, a decision balance-sheet was used to motivate subjects to remain in the program. Participants were asked to record expected gains and losses that might result from involvement in the program. In the second study, a structured social support program was used in addition to the decision balance-sheet. The social support included a booklet telling participants about the adherence problem along with suggestions as to how they might structure individual environments to facilitate adherence to the aerobics class. They were also given self-monitoring charts to keep track of attendance, as well as a place to record the social support received each week. Each person also had an

exercise buddy.

Results from both studies (Wankel, Yardley, & Graham, 1985) indicated that both treatment effects were positive, although there was not much difference between treatments. However, in follow-up evaluations, participants and instructors liked the in-class buddy support and the general class support and found these to be very important. Many did not use the self-monitoring charts that had been provided.

Another study by Wankel (1985) attempted to differentiate exercise dropouts from continuing participants. Interviews were conducted approximately 8 to 10 months after the end of the exercise class. Fifty-one participants and sixty dropouts were asked questions to obtain reactions to the program, reasons why subjects initially began the program, social support for involvement in the program, and what subjects would do to improve the program. Compared to the dropouts, continuing participants were more likely to have set goals for the program such as developing social relationships and developing physical skills. Continuing participants also thought the level of friendship was greater in the program, and reported receiving more encouragement and support from work supervisors and friends than did the dropouts. Encouragement from the work supervisor was the second most important factor in distinguishing between the continuing participants and the dropouts.

The findings of Wankel's (1985) study also supported findings of an earlier study by Heinzelmann and Bagley (1970).

The primary focus in the Heinzelmann and Bagley study was the structure of social support that already existed in the participant's life. There was no actual social support intervention. Researchers found that men whose wives had positive attitudes about the involvement of their husbands in the program had strong patterns of adherence (80%). Men whose wives felt neutral or negatively about involvement of their husbands in the program had significantly lower adherence records (40%).

Two other studies were conducted to test the effects of social support and reward on adherence to exercise over the course of a school semester (Kravitz & Furst, 1991). In the first study, subjects from aerobics classes self-selected themselves into one of three groups, a work individually for rewards (of clothing) group, a 3-person group to work for rewards, or a group that received no reward or social support. In the second study, the only difference was that the groups that worked together for rewards were two-person groups, not three.

Results of an ANOVA indicated that there was a significant difference in class attendance among the groups in both studies. The first two groups had much better attendance than those in the groups who received no reward or social support. However, there was not a statistically significant difference in attendance between the subjects who exercised for rewards individually and those who worked together for rewards.

While it could be concluded from the results of these studies that the incentive for adherence to the classes was rewards, and that social support did not add anything crucial, there was not much evidence that the instructor or anyone else provided the impetus for developing social support. The aerobics instructor merely encouraged camaraderie among group members during class announcements. Also, the average aerobics class size was 88, and this may have been a prohibitive factor in the development of any meaningful social support, without any structured method for doing this.

Social support can also be defined as extra attention from an exercise class instructor. In a study of post-coronary patients, extra support and empathy received from the exercise leader helped distinguish adherers from those who dropped out of the exercise program. Patients who felt a lack of individual attention were approximately twice as likely to quit attending the exercise program (Andrew, et al., 1981).

This type of support, extra attention from the instructor, was compared with self-monitoring, body fat percent and self-motivation to determine their effects on attendance at a community gymnasium (Weber & Wertheim, 1989). Women were assigned to either a self-monitoring group, a self-monitoring plus extra instructor attention from staff group, or a control group. Control group subjects attended much less than subjects in the other groups. Body-fat percent and self-motivation did not predict adherers from those who dropped out of the program. Extra attention did not seem to increase

continued participation, either. However, researchers pointed out that instructors at this exercise facility may have already been perceived as friendly and attentive, and, thus, there may have been a ceiling effect regarding the extra attention factor. Overall, researchers conlcuded that the self-monitoring intervention was the most effective mode of maintaining adherence, even though compliance to the self-intervention tapered off at the end of the exercise program.

Little research examining social support provided by the members in the exercise program has been conducted. From studies that have been done, though, this type of social support does seem to have positive effects on adherence. One study that reported very high adherence rates (94%) stated that the group composition and group dynamics had a very strong influence (Gillett, 1988). Danielson and Wanzel (1977) found that women were much more likely to attend exercise classes if a partner or friend was going with them.

Self-Efficacy and Adherence

SCT is becoming the most researched variable in exercise adherence (Godin & Shephard, 1990). Indeed, its impact is obvious as many of the adherence theories discussed here have incorporated self-efficacy into their paradigms. Many studies have tested the relationship of self-efficacy to the adoption and maintenance of exercise.

Data from the Stanford Community Health Survey showed that self-efficacy is significantly related to exercise activity at various stages of exercise adoption and adherence.

Efficacy cognitions predicted adoption but not maintenance of vigorous exercise behavior, and conversely, maintenance was not a determinant of moderate exercise behavior. Researchers concluded that self-efficacy seemed to play an important role in the exercise process and that self-efficacy is much more complex than previously thought (Sallis, Haskell, Fortmann, Vranizan, Taylor, & Solomon, 1986).

In examining self-efficacy, some researchers have suggested that an important differentiation may exist between exercise adherers and nonadherers. These two groups were investigated in a mixed gender study of adults participating in a twice-per-week, 22 - session exercise program (Desharnis, Bouillon, & Godin, 1986). The distinction between expectations of outcome and self-efficacy was made to predict adherence. Results indicated that expectations were predictive of adherence, with self-efficacy being a slightly stronger predictor.

Results also showed that nonadherers were more uncertain at the outset of the program about their ability to attend the program on a regular basis. On the other hand, nonadherers also expected more benefits from participation than did the adherers. The authors concluded that one way to predict the likelihood of someone adhering to an exercise program could be to assess at the beginning of the exercise program, the participants' expectations for the exercise program.

Relapse Prevention Model and Adherence

The success of Marlatt and Gordon's relapse-prevention model (R-P model) (Marlatt & Gordon, 1980; Marlatt & Gordon, 1985) has prompted an interest in its possible use and application in the investigation of exercise adherence (Dishman, 1988). This cognitive-behavioral model has origins in the study of relapse of substance abusers and cigarette smokers. In these areas, the R-P model has been used to reduce the incidence of an undesired behavior. When applied to exercise adherence, the goal has been to increase the incidence of a desired behavior. The model has also been focused on behaviors where the self-control efforts are voluntary as opposed to a forced increase or decrease of a behavior.

Marlatt and Gordon (1985) have described how someone may become predisposed to a relapse when encountering a difficult, high-risk situation. A high-risk situation would be any situation that is seen as challenging to the ability to maintain self-control regarding the behavior change. When overwhelmed with more "shoulds" than "wants" in life, this can lead to a "desire for indulgence," and a craving for the "forbidden fruit" (such as a cigarette, or a piece of cake, or skipping an exercise class). The best outcome of the relapse-prevention model would be to view exercise as a much-desired "want" and not a "should."

Essentially, the model states that when a high-risk situation is encountered and there are no coping strategies to

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ward off the temptation, a relapse is likely to occur. The absence of an adequate coping system or strategy causes a subsequent decrease in self-efficacy, followed by the execution of the undesired response or behavior, followed by the "cognitive phenomenon" called the "abstinence violation effect," (Brownell, Marlatt, Lichtenstein, & Wilson, 1986). This is a loss of control that results from the violation of a self-imposed rule. The end result of the abstinence violation effect is an increased likelihood of a relapse.

Many coping and relapse prevention strategies can be utilized that fit the R-P model. Typically, relapse prevention begins by helping people identify the potential and inevitable difficulties that may make it difficult for a behavior to be performed or avoided. This is done by working together and carefully defining, identifying, and accurately predicting high-risk situations specific to the behavior change. This can be accomplished in a variety of ways. The individual may engage in self-monitoring and record- keeping to determine exactly when a behavior is easy or difficult to perform or avoid. Individuals may also role-play various situations in which they describe or respond to hypothetical high-risk situations. Finally, individuals may be asked to describe their thoughts about what might keep them from or lead them to a desired behavior change, or discuss actual prior relapses (Marlatt & Gordon, 1985).

After high-risk situations are identified and individuals are consciously aware of these situations, plans can be made

to avoid and/or coping responses can be learned to help deal with the situation. The responses can be taught in many ways, but role-playing is probably the most common teaching method (Knapp, 1988).

If individuals already possess the skills to deal with relapse, they may be inhibited or anxious to perform the skills. In these cases, stress management, relaxation training, and guided imagery may be warranted. An example related to exercise adherence would be the case of someone with poor body self-image who is hesitant to exercise in front of others. These relaxation and stress management skills could assist the person in feeling more comfortable to practice the relapse prevention skills necessary to continue in an exercise regimen (Knapp, 1988).

Another piece of the relapse-prevention model is the decision matrix (Marlatt & Gordon, 1985). The goal of the decision matrix is to help exercisers identify the anticipated consequences of engaging or not engaging in a behavior. For example, in exercise, individuals would list possible positive and negative short- and long-term outcome expectancies for exercising, such as "feel more energetic," or "eat dessert without feeling guilty." Expectancies are listed for participating in a regular exercise program and for not participating or dropping out of an exercise program. The instructor can then identify any positive expectancies someone may have for skipping exercise, and discuss how the "actual and delayed effects" may not be all that positive in reality

(Knapp, 1988).

Marlatt and Gordon (1985) also recommend planning for a lapse, and perhaps even having a lapse to learn how to respond to it positively. A lapse is seen as something that could lead to a full-blown relapse. The lapse, then, is a potentially critical event in the relapse-prevention model which needs to be dealt with very specifically by the individual.

Several behavioral methods can be used to deal effectively with a lapse. One method is to contract with the person and include the exact length of time that a lapse will last. Engaging in other forms of exercise to prevent boredom and injury is also helpful. A system of self-provided positive reinforcement could also be utilized. For example, individuals could treat themselves to a certain "indulgence" following an exercise class, such as a massage or drink with a friend.

Cognitive restructuring is another method often used in the relapse-prevention model. It can be used on the preventive side as well as to cope with a lapse. Cognitive restructuring can be taught to put the lapse into a more realistic perspective. For example, the lapse can be viewed as a mere "slip," in which the person can "recover from" quickly by simply rescheduling or attending a different exercise class. A lapse can also be seen as just a mistake from which something can be learned so that the situation is handled differently the next time. In addition, the lapse can

be viewed as a situation to be analyzed, rather than a weakness of the individual and a terrible failure.

Thought-stopping is another cognitive technique to interrupt or stop any negative and undesired thoughts regarding exercise participation. The thoughts can then be replaced with positive thoughts and imagery where the individual is being physically active and succeeding at this task.

Another tool to use in the relapse prevention model as well as with actual lapses is proper goal-setting (Marlatt & Gordon, 1985). As with cognitive restructuring, the objective of goal-setting is to minimize the deleterious effects of a lapse. The abstinence violation effect can be lessened if rigid and strict goals are avoided. Goals should be flexible and attainable, while maintaining a sufficient level of challenge. Participants, then, should also be allowed to alter their goals based on the fact that life situations can change over the course of an exercise program, and exercisers may also want to increase the difficulty of the goals.

Overall, individuals should be taught that urges and desires to skip exercise class are common and inevitable. Labelling such urges "intellectually" helps exercisers see these desires as controllable rather than irresistible and having power over them. Normalizing the urge to skip exercise, for instance, and providing psychological tools to overcome them is the goal of the application of the relapse-prevention model to exercise (Dishman, 1988).

The relapse-prevention model (Marlatt & Gordon, 1985) has not been applied extensively to the study of exercise adherence, but the research that has been done provides evidence of its effectiveness in this area. Unfortunately, one of the first studies utilizing the model was flawed inadvertently by an experimental assistant (Martin, Dubbert, Katell, Thompson, Raczynski, Lake, Smith, Webster, Sikora, & Cohen, 1984). Procedures were confounded when extra exercise sessions were arranged for the nonrelapse subjects. In the study, subjects were informed of the likelihood of urges to skip exercise, factors that frequently contribute to lapses, and the abstinence violation effect. Subjects also experienced a planned lapse and used group problem-solving to process the various response outcomes. Perhaps because of the methodological problems, however, no differences were found between the relapse group and the control group.

Another study utilizing the relapse-prevention model was conducted by King and Frederiksen (1984). This study separated the relapse-prevention model from social support and categorized them as two different types of treatment. It is also one of the few studies that included relapse-prevention and social support in the same study. In this study social support was defined as the "presence of interpersonal liking, attraction, and group cohesiveness" (King & Frederiksen, 1984, p. 5). Subjects were undergraduate women who were not exercising currently. Comparisons were made between a support alone group, a relapse prevention alone group, a group that

received both interventions, and a control group. The relapse prevention treatment included the provision of vignettes of situations where skipping exercise would be likely. The subjects were taught coping strategies for dealing with self-defeating thoughts and provided behavioral methods for handling a lapse.

Those in the relapse-prevention alone group and the support alone group ran significantly more than subjects in the control group during a five week period. This difference was also seen at the three month follow-up. However, those who were given the relapse training but were instructed to run with others did no better than the control group who received no relapse training. This study provides some support for the relapse model, yet running with others may have had a neutralizing effect on those who received the relapse training in conjunction with exercising with others.

Two studies that used the Relapse-Prevention Model were done by Belisle, Roskies and Levesque (1987). The second study was to be a replication of the first, only conducted a year later. However, the second study had to be modified because of a strike at the university by support staff where the study was being conducted. Namely, the number of exercise sessions was much less. These studies attempted to increase attendance during a short-term exercise program, and assess the participants' continuation of exercise behavior for twelve weeks after the completion of the structured exercise program.

The studies used an experimental group whose members

received the relapse-prevention intervention, and the control group whose members participated in the regular exercise period. Typical exercise sessions included a 15 minute health education section. During this time, the control group received information generally given to people in these classes, such as nutrition information, injury information, relaxation techniques, etc. The experimental group received different information, such as how to acquire new healthy habits, recognizing danger signals and critical situations that might keep one from exercising, and how to overcome them. These are strategies in the relapse-prevention model that hopefully keep people from skipping their exercise regimens.

Researchers (Belisle, et al., 1987) highlighted three main results from this study. First, individuals in the relapse-prevention group demonstrated superior adherence compared to the control group, in both the short-term and long-term adherence assessments, although the difference was small. Second, the treatment effects accounted for only a small percentage of the variance. Third, the demographic characteristics of the subjects did not seem to affect adherence, primarily because the groups were quite homogeneous.

Even though the differences were small between the experimental and control groups in this study, Belisle, Roskies, and Levesque (1987) recommended the continued use and research of the relapse-prevention intervention in future studies. They cited the R-P model's use of many different,

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but related cognitive strategies, and the low cost-benefit ratio. Little extra supervision and training was necessary for the relapse-prevention to be implemented, so any increase in adherence was viewed as a positive outcome.

Belisle, Roskies, and Levesque (1987) suggested ways to improve the use of the relapse-prevention intervention. Most importantly, they suggested more rigorous assessment of the possible barriers to adherence for the specific target population and adaptation of the intervention to fit those needs accordingly.

Self-Efficacy, Social Support, and Adherence

Current research has begun to examine how social support is able to enhance exercise adherence. McAuley (1992) suggested that the effects of social support on adherence are indirect in that the effects are filtered through perceptions of self-efficacy. McAuley postulated that through support from others in the environment, individuals receive information about their own capabilities and self-efficacy may be enhanced. McAuley has conducted several studies that will be discussed, but he also recommended that more research be conducted to further the understanding of the relationship between self-efficacy, social support, and adherence.

Only a few studies have investigated the interaction of self-efficacy and social support such as the one proposed here. Duncan, McAuley, Stoolmiller, and Duncan (1993) examined the relationships among efficacy cognitions, social support, and exercise adherence. The researchers used the

provisions of social support described by Weiss (1974) to assess the social support that already existed in the subjects' lives. Subjects, who ranged in age from 45 to 64, were healthy, sedentary males and females and participated in a 10-week exercise program. Adherence was measured via attendance, which was required 3 times per week. Results demonstrated that self-efficacy acted as a cognitive mediator between social support and exercise adherence.

In a related study, Duncan and McAuley (1993) examined the same data as the above study with different statistical analyses and found the same results. Conclusions from this study emphasized the need for further research with different populations and with other forms of social support. Researchers also recommended the assessment of subjects' fitness levels to ensure that the exercise is physically beneficial to the subjects.

McAuley and Jacobson (1991) assessed body weight, self-efficacy, self-motivation, instructor influence and adherence during an 8-week exercise program. Subjects were sedentary adult females who volunteered for the program. Attendance was the adherence measure and results showed that instructor influence, a form of social support and self-efficacy explained much of the variance in program attendance. However, self-efficacy was the only significant predictor of overall exercise levels.

Summary

Research in the field of exercise adherence indicates that although there are many theories that account for some of the variance in explaining adherence of individuals to exercise regimens, no one theory has successfully led to the long-term goal of implementing lasting behavioral change.

Self-efficacy and social support are two constructs that can be singled out as the most promising components in which future research should focus. The fact that social support is currently present in existing theories helps highlight its often undervalued importance.

Self-efficacy, on the other hand, while not overtly mentioned in many theories, is gaining popularity in current research as it continues to prove itself a strong determinent in exercise adherence. Current research is beginning to incorporate self-efficacy into current theories to improve their predictive value.

The evidence from current research suggests that social support and self-efficacy are vital factors in the study of exercise adherence. These concepts, then, deserve greater examination in exercise settings, to help determine their ultimate value in explaining exercise adherence.

Chapter Three

METHOD

The method and design of the research study to examine the hypotheses presented in Chapter One are detailed in this chapter. The hypotheses are presented again along with their operationalized form. The population is designated along with the sampling procedures used to obtain subjects. The variables of interest are defined and the measures are described.

Research Hypotheses

1. The relapse-prevention form of social support will lead to the highest adherence rates as measured by attendance; the buddy-system will have the second-highest attendance rates; and the telephone contact will have the third-highest attendance rates.

2. The greater the reported level of self-efficacy assessed by the exercise self-efficacy scale, the greater the attendance to the aerobics exercise class. Subjects in the higher self-efficacy group will attend aerobics classes more often than subjects with lower self-efficacy.

3. Subjects who have a higher level of self-efficacy and also receive social support will have greater exercise adherence than those with lower self-efficacy regardless of social support received. Thus, there will be an interaction effect in that the greater the level of social support, combined with higher self-efficacy, the greater the attendance

to the aerobics exercise class.

Measures

Adherence. There has been a great deal of variability among adherence measures in the exercise adherence literature, as well as in how adherence is operationally defined. However, the most common and direct indicator has been attendance (Perkins & Epstein, 1988). Attendance, specifically, the total number of times subjects attended aerobics sessions was utilized in this study as the measure of adherence.

Independent Variables

Self-efficacy. As mentioned earlier, self-efficacy has repeatedly been shown to be the most promising variable in current exercise adherence literature. Moreover, there is increasing evidence to show that self-efficacy may interact with other variables to affect adherence. Current research has demonstrated that social support, for example, is likely to be mediated by self-efficacy in exercise settings (McAuley, 1992). Therefore, self-efficacy was an important independent variable in this study. It was measured utilizing questions designed specifically for this exercise class. This is in keeping with the prescribed application of Social Cognitive Theory (Bandura, 1986). This method for developing exercise-related questions was patterned after research conducted by Duncan and McAuley (1993).

Specifically the exercise self-efficacy measure used in this study consisted of seven items that indicate the

subject's beliefs in their capabilities to successfully adhere to an exercise program despite potential barriers (see Appendix B, p. 130, items 1-7, for self-efficacy measure - barrier items). If subjects indicated they could continue to exercise in spite of a certain barrier, then they were asked how confident they were in that belief on a scale ranging from 0% (not at all confident) to 100% (absolutely confident).

In addition to the seven items relating to barriers to adherence, three items were asked to indicate how confident subjects were in their belief about their ability to exercise vigorously (intensity level) at a target heart rate level for 20 minutes, 30 minutes, and 40 minutes. (see Appendix B, p. 131, items 8-10, for self-efficacy measure - exercise intensity items). The ten items are joined together to form a single self-efficacy score. Thirty-two college age females participated in the pilot test of this self-efficacy questionnaire. The first seven items had a reliability score of .77 and the last three items had a reliability score of .90 using Cronbach's alpha.

Social support. Social support was assessed via the Social Provisions Scale (Russell & Cutrona, 1987). Social support is viewed as a potential way to improve self-efficacy. It is suggested that this might be done by allowing individuals to gain further coping skills and insight regarding their own capabilities through their relationships with others.

The Social Provisions Scale (see Appendix B, p. 132 for

Social Provisions Scale) was developed to measure the six relational provisions of the social support theory developed by Weiss (1974). On the Social Provisions Scale, respondents rated the extent to which their respective social support groups provided them with the six provisions. Each provision is assessed by four items. Two of the items relate to the presence of the provision and two relate to the absence of the provision. Four-point scales (4 is completely true and 1 is not true at all) depict the degree to which each item describes their current social relationships. High scores indicated greater social support. In a study conducted by Duncan and McAuley (1992), internal consistency was determined by Cronbach's (1951) alpha. Internal consistencies for the six provisions of social support included the following: provisions of guidance (r=.89), reassurance of worth (r=.68), social integration (r=.82), attachment (r=.88), reliable alliance (r=.89), and opportunity for nurturance (r=.82).

In addition, social support was measured following the exercise program utilizing questions developed by the researcher (See Appendix C, p. 144 for social support items completed at the end of the semester). Subjects were asked at the end of the semester if various significant people in their lives (e.g., parents, friends, physician) had provided negative or positive support for their participation in aerobics. They were given the choices of very negative, negative, positive, very positive, or no support received, in which to answer the questions.

Confounding variables

In a review of exercise adherence research Dishman (1991) found that many factors besides self-efficacy and social support contribute to exercise adherence, but have typically accounted for only a small percentage of the variance. However, the following control variables have proven to be sufficiently significant in accounting for variance in exercise adherence in other studies to warrant consideration in the present study. The confounding variables were chosen from among many possible variables that contribute somewhat to adherence because it is believed that they could confound the results of this study if left uncontrolled. The goal of this study was to be able to more clearly determine the distinct importance of social support and self-efficacy in exercise adherence. By controlling these variables, this goal was more likely to be achieved.

Previous exercise experience. In supervised programs, previous experience with exercise regimens has been shown to be an important predictor of exercise adherence, sometimes the most important determinant (Dishman, Sallis, & Orenstein, 1985). To date, no study has found a relationship between participation in interscholastic or intercollegiate sports and adherence to preventive exercise programs or to other unstructured exercise (Dishman, 1991). Because the present study involved a structured exercise program, subjects were asked to describe past exercise experiences including participation in organized classes, regularity of individual

workouts, organized sports participation (such as high school sports or college intramural programs, and whether they have engaged in any other exercise activity and/or are currently in an exercise program in addition to aerobics (see Appendix B, pg. 129, items 1-10, for previous exercise items).

Attitude toward exercise. This was assessed in two ways. Initially, attitude toward exercise was not very successful in predicting adherence. Early studies utilizing Fishbein and Ajzen's (1975) theory of reasoned action as the theoretical framework utilized Kenyon's (1968) Attitude Toward Physical Activity Scales. However, Kenyon's original study had confounding problems in the intervention and no strong conclusions were made. Subsequent studies, however, were unable to find differences between exercise dropouts and adherers using Kenyon's scale (Massie & Shephard, 1971; Dishman, Ickes, & Morgan, 1980).

Recently, research has shown that attitude toward exercise is more accurate when assessed in relation to a specific exercise program or regimen. Attitude has been found to be a good predictor of adherence in several studies (Wankel, 1985; Godin & Shephard, 1986; Godin, et al., 1987). Subjects' attitudes were assessed regarding their participation in this exercise routine, specifically assessing their level of enjoyment (See Appendix B, p. 130, whole page, for attitude toward exercise questionnaire items). Subjects' attitudes were measured at the beginning and the end of the exercise program. Questions used to assess attitude toward

exercise were devised by the researcher and followed the method developed by Fishbein and Ajzen (1975) and applied to exercise by Dzewaltowski (1989).

The pilot test of the two questions conducted at one of the universities in this study at a separate recreational facility where the subjects in the present study did not exercise. Thirty students who attended aerobics filled out the pilot questionnaire and a reliability of .82 and .92 was established for the two parts of the attitude scale. The score was derived by summation, and higher scores indicated a more positive attitude toward exercise.

Incentives for exercise. Some research has demonstrated that the reasons people exercise may affect the adherence rates of these same people. Duda and Tappe (1989) developed the Personal Incentives for Exercise Questionnaire (PIEQ) and utilized aspects of the Theory of Personal Investment (see Appendix B, pg. 128-129, items 1-48, for PIEQ).

This measure consists of 48 items that assess nine categories of incentives related to exercise: appearance, competition, weight management, mastery, affiliation, social recognition, flexibility/agility, health benefits, and fitness (strength/endurance). Duda and Tappe (1989) found reliability coefficients for the nine categories to range from .77 to .94. Subjects responded using a 5-point Likert scale. Subjects were given the PIEQ at the beginning and the end of the semester.

Other Variables

Demographic descriptor variables. Demographic data were assessed using a "Personal Information" section on the pre-intervention materials (see Appendix B, pg. 126 for the demographic items). Information was collected on the subjects' age, sex, employment status and school major.

Sample and Procedures

Sample. The sample in this study was drawn from existing volunteer aerobics classes at two universities in two different cities. University A is a private four-year university with a population of approximately 5000 students. University B is a public four-year institution with a student enrollment of approximately 20,000. A total of 104 female subjects completed the pre-intervention survey. A total of 86 subjects completed the post-intervention survey, and these were the subjects on which the results were based. All subjects were female and ranged in age from 18 to 25. All were undergraduate students except for two graduate students.

University A's aerobics program utilized a punch-card system. Students pay a one-time fee per semester and can then attend as many classes per week as they wish. There is also an option to pay per 15 or 20 sessions, or per individual session. Most students preferred the punch-card system as it allows for the most flexibility and is the cheapest. Only those students who purchased a full semester pass were included in the study. This was so that financial barriers did not confound the attendance of subjects to the aerobics

classes. The exercise aerobics sessions at University B were free except for the step aerobics sessions. Thus, subjects in step aerobics were not included in the study.

Subject selection. Subjects were recruited during the first week of the semester from late afternoon/early evening classes, as they were the most well-attended. An announcement concerning the opportunity to participate in the study was made in the first week of the semester by the instructor at the beginning of each class. Following the announcement, the researcher described the study (see Appendix A for consent form and description of study). After class, the instructor again reminded the class participants of the research and the researcher provided a description of the study and the consent form at this time (see Appendix A for description given to subjects and consent form). Most subjects chose to complete the survey following the aerobics session. Others chose to complete it later in the first week, either just before or immediately after an aerobics session.

Subject assignment. The self-efficacy scores were determined and subjects were divided into two groups via a median split of the self-efficacy scores. In each of the self-efficacy groups, subjects were randomly assigned by the researcher to one of four treatment groups; relapse-prevention, buddy-system, telephone contact, or control. A table of random numbers was used to randomly assign subjects to the four social support intervention groups.

Statistical analyses of the confounding variables were

done after this procedure was completed to test for significant differences among the groups. The confound variables - previous exercise in the past year, attitude toward exercise, incentives to exercise, and other social support - were analyzed using a series of oneway ANOVA tests. The first ANOVA analyses resulted in statistically significant differences among the groups, so the researcher reassigned subjects to the groups to ensure that the groups were equal. This assignment process took approximately three or four times utilizing the random numbers table. Results of the final ANOVA results are shown in Table 1. The means and standard deviations for the final subject assignment are also presented in Table 2. During the first week, subjects were notified of their group assignments via telephone.

Procedure. At the first meeting of the relapse-prevention group, the planned content of the meetings was presented to the subjects. Individuals in the buddy-system group were paired with a partner, largely based on when they had planned to attend aerobics. Pairing based on planned attendance was not always possible, though, and some individuals in the pairs did not attend the same session. A description of the buddy relationship was provided to them over the telephone by the researcher. They were given suggestions as to how they might best use their "buddy" to keep each other motivated to attend the class. For instance, the researcher suggested that they contact each other via a phone call or by attending the same aerobics sessions, or

dropping each other an encouraging note regarding aerobics. Subjects were also given a form to keep track of the contact they made with their "buddy" over the semester, along with the type of contact (e.g., phone call, visit).

Table 1

ANOVA Results for Pretest Confounding Variables by Treatment Groups

Confounding Variables	ss	ms	df	f	p
Attitude toward exercise					
Between groups	123.7885	41.2628	3	.5709	.6358
Within groups	5781.7710	72.2721	80		
Incentives to exercise					
Between groups	1635.4625	545.1542	3	1.7670	.1603
Within groups	24373.1881	308.5214	79		
Social Provisions Scale					
Between groups	253.3074	84.4358	3	1.7511	.1632
Within groups	3857.3950	48.2174	80		
Previous exercise					
Between groups	122.4385	40.8128	3	1.1053	.3519
Within groups	2990.8556	36.9241	81		

Table 2

Pretest Means and Standard Deviations for All Confounding Variables by Assigned Social Support Group

	Meeting (n=21)	Buddy (n=20)	Phone (n=24)	Control (n=21)
Attitude toward exercise				
M	21.0	20.10	19.83	17.67
SD	9.54	10.03	7.71	6.47
Incentives to exercise				
M	185.56	193.17	185.75	195.48
SD	23.05	11.28	18.33	14.81
Social Provisions Scale				
M	83.38	82.75	83.55	87.20
SD	7.24	7.58	7.59	5.05
Previous exercise				
M	16.58	14.37	16.13	13.67
SD	4.51	6.60	7.48	5.03

The telephone contact group was notified over the telephone of their group status. Telephone group subjects were informed that they would be called once a week by someone other than the researcher and given encouragement and a reminder to attend aerobic classes. They were told that the calls would last approximately 1 to 3 minutes.

Regular attendance was recorded by each subject in a notebook provided to them by the researcher at the beginning of the semester. At University A, attendance was already currently being taken at these classes, so the researcher collected these from the intramural office on a weekly basis. The researcher compared the attendance sheets with the records

that the subjects kept to check for accuracy. This comparison found that subjects did keep accurate records of their attendance. No such check was available at University B, so for analysis, only the subjects' records of attendance were used from the two universities.

During the final two weeks of the regular semester, an announcement was made at the classes by the researcher to remind subjects to return their notebooks and attendance sheets, and to fill out the second questionnaire (see Appendix C). As in the beginning of the semester, subjects filled out the questionnaire just before or immediately after an aerobics session.

Treatment

As mentioned previously, there were three different kinds of social support used as interventions in this study. The first was the relapse-prevention group, which met weekly at a time that was convenient to the members. At University A two meetings were held just prior to the two Monday exercise sessions. The two meetings were identical and were held at different times to accomodate subjects' schedules. At University B, one meeting was held just prior to the early afternoon session on Wednesday. The relapse-prevention meeting topics are presented in Table 3.

Table 3

Relapse - Prevention Meeting Schedule and Topics

Meeting Number	Meeting Content
1	Introduction/get acquainted
2	Importance/benefits of regular exercise
3	Keeping an exercise record/target heart rate
4	Abstinence violation effect
5	Danger signs/critical situation
6	Nutrition
7	Stress management
8	Energy expenditure of various activities
9	Relaxation techniques
10	Overcoming abstinence violation effect and critical situations
11	Acquiring and maintaining healthy habits
12	Post-questionnaire/wrap-up

The second type of social support used was the buddy-system. The subjects in the buddy-system group were assigned to their "buddy" by the researcher. Although this was not ideal as subjects attended many different sessions, subjects were assigned based on when they stated they would likely attend the aerobic classes. Suggestions for encouraging each other were made by the researcher (e.g., attending the classes together, calling one another as reminders). In addition, a

form was given to them to record when they had contact with their "buddy" and what type of contact was made.

The third support intervention was the telephone contact group. To more closely match the frequency of contact with the relapse-prevention group and the buddy system group, the subjects in the telephone contact group in this study received weekly calls from someone trained by the researcher. Two trained callers were utilized, one for each university. The content of the telephone calls were supportive in nature and served as a reminder for subjects to attend class. Only minimal encouragement was given; phone calls were approximately two - three minutes in length.

The researcher contacted the control group subjects by telephone and instructed them to keep track of their aerobic session attendance using the notebooks distributed to them. Subjects were also told that the notebooks would be collected from them during the last week of the semester.

Chapter Four

RESULTS

To test the three hypotheses of this study, a 2 X 4 ANOVA (self-efficacy by social support) was utilized. To test the differences between the four social support groups on attendance, the main effect of treatment was investigated. Hypothesis 1 was not supported; the social support treatment groups did not have the predicted effect on attendance. Table 4 shows that there were no statistically significant differences between the social support groups and their effect on attendance to aerobics.

Table 4

ANOVA Results for Attendance by Treatment Group and Self-Efficacy Level

	ss	df	ms	f
Main effects				
Hypothesis I: Social Support	522.578	3	174.193	1.110
Hypothesis II: Self-efficacy	2401.214	1	2401.214	15.302***
Interaction				
Hypothesis III: Social Support X Self-efficacy	258.227	3	86.076	.549
Error	12239.890	78	156.922	

***p<.001
**p<.01
*p<.05

Specifically, the relapse-prevention group, which received the most social support, had the highest average attendance rate over the course of the semester with an average attendance of 22.90 (SD = 12.65) sessions. However, the telephone group, which received only weekly phone calls as social support, had the second highest attendance rate, with an average of 22.33 (SD = 12.54) sessions. The buddy group and the control group had average attendance rates of 15.55 (SD = 11.03) and 21.48 (SD = 16.98) sessions, respectively. However, there were no statistically significant differences between any of the four treatment groups on attendance.

The second hypothesis stated that subjects with higher self-efficacy would attend aerobics classes at a greater rate than the lower self-efficacy subjects, regardless of the experimental treatment group in which they were placed. To test this hypothesis the main effect of self-efficacy was examined and this was found to be statistically significant (see Table 4). Average attendance for the high self-efficacy subjects was 26.05 (SD = 14.65) sessions whereas the average attendance for the low self-efficacy subjects was 15.07 (SD = 9.77) sessions.

The third hypothesis stated that there would be an interaction effect between self-efficacy and social support. The data did not indicate a significant interaction between the high and low self-efficacy groups and the social support treatment groups (see Table 4). Thus, this hypothesis was not supported. Table 5 shows the means and standard deviations of

the interaction between self-efficacy and social support. However, some interesting observations should be noted. For instance, results indicated that the group with the highest overall attendance was the high self-efficacy subjects who were in the control group and received no treatment-related social support. The group with the lowest attendance rate were the subjects with low self-efficacy in the buddy-system group, and not the control group as had been predicted.

One reason for the lack of significance for this interaction may be the small number of subjects within each cell. Although the sample was sufficient to provide confidence in the overall test, it may not have been sufficient to provide statistical support for means that are twice as large between cells (see Table 5)

Table 5

Cell Means, Standard Deviations, and Size of Group for Attendance by High and Low Self-efficacy Groups and Social Support Groups

	Relapse Prevention	Buddy	Phone	Control
Low self-efficacy	M=15.67 SD=10.82 n=9	M=11.45 SD=9.76 n=11	M=19.00 SD=11.08 n=11	M=14.27 SD=7.07 n=11
High self-efficacy	M=28.33 SD=11.44 n=12	M=20.56 SD=10.89 n=13	M=25.15 SD=13.43 n=9	M=29.40 SD=20.27 n=10

Postest results of confounding variables

Confounding variables were again analyzed at the end of the treatment. This was done to determine if differences emerged over the semester between the groups due to attrition, and to look for changes that will not be discussed at this time and are outside the scope of the present study. Posttest questionnaires were completed at the end of the semester. The confounding variables analyzed were identical to the pre-intervention confounding variables, except that "previous exercise" became "fall exercise," that is, other exercise outside of aerobics that occurred during the duration of the study. A oneway ANOVA was utilized to test for differences between the social support treatment groups and the confounding variables. Table 6 shows that, as in the pretest results, there were no significant differences among the social support groups on any of the confounding variables. Only "incentive to exercise" approached significance. The summary statistics of the posttest questionnaires are presented in Table 7.

Table 6

ANOVA Results for Postest Confounding Variables

Confounding Variables	Treatment groups x confounding variables				
	ss	ms	df	f	p
Attitude toward exercise					
Between groups	109.2753	36.4251	3	.4541	.7151
Within groups	6577.0619	80.2081	82		
Incentives to exercise					
Between groups	2012.5301	670.8434	3	2.3317	.0802
Within groups	23591.8071	287.7050	82		
Social Provisions Scale					
Between groups	184.7480	61.5827	3	.9103	.4398
Within groups	5479.4403	67.6474	81		
Fall exercise					
Between groups	33.7413	11.2471	3	.4776	.6988
Within groups	1907.6705	23.5515	81		

Table 7

Postest Means and Standard Deviations for All Confounding Variables by Assigned Social Support Group

	Meeting (n=21)	Buddy (n=20)	Phone (n=24)	Control (n=21)
Attitude toward exercise				
M	22.05	19.10	21.25	19.90
SD	9.94	7.45	9.19	8.96
Incentives to exercise				
M	184.86	194.45	183.00	192.29
SD	22.20	14.15	16.07	14.13
Social Provisions Scale				
M	82.14	83.65	80.57	84.33
SD	7.36	9.48	8.78	7.04
Fall exercise				
M	12.43	12.05	13.26	11.57
SD	4.02	5.31	6.15	3.30

In addition to testing for the treatment group differences, testing was also done to determine if there were significant differences between the high and low self-efficacy groups. Contrary to findings in the preintervention analysis, there was a significant difference between the high and low self-efficacy subjects on the previous exercise experience variable, $F(1,83) = 13.8374$, $p < .001$. No other confounding variables showed significant differences between the self-efficacy groups, although attitude toward exercise and incentive to exercise approached significance. ANOVA results in Table 8 show that subjects higher in self-efficacy acknowledged significantly greater physical activity prior to the beginning of this aerobics program. This finding is also consistent with other research studies in this area.

Table 8

ANOVA Results for Self-Efficacy by Confounding Variables

	Self- efficacy by confounding variables				
Confounding Variables	ss	ms	df	f	p
Attitude toward exercise					
Between groups	194.9858	194.9858	1	2.7874	.0989
Within groups	5666.0744	69.9515	81		
Incentives to exercise					
Between groups	1068.0385	1068.0385	1	3.4243	.0680
Within groups	24639.9121	311.8976	79		
Social Provisions Scale					
Between groups	.0244	.0244	1	.0005	.9824
Within groups	3981.4512	49.7681	80		
Previous exercise					
Between groups	451.6734	451.6734	1	13.8374	.0004***
Within groups	2643.9651	32.6415	81		

***p<.001
**p<.01
*p<.05

Subjects were also asked at the beginning of the semester if they were planning on attending aerobics by themselves, with a friend, or with a group of friends. A Kruskel-Wallis test showed that there were no significant differences between the treatment groups on this dimension, $X(3) = 4.86$, $p > .05$.

In the beginning of the semester, 37 of the subjects stated that they would be attending with a group of friends. Twenty-seven of the subjects said they would attend with a friend, and 21 said they would be going alone. When asked at the end of the semester, only 17 said they attended aerobics with a group of friends, while 36 went with one friend, and 31 subjects went by themselves. Following informal discussion among subjects, it was found that initially large groups from residence hall floors and sororities attended together, but by the time the semester was over, the groups had dwindled to just a few or perhaps two people from the original group that still attended.

Subjects in the three treatment groups were asked to evaluate the respective interventions on a Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). A series of oneway ANOVA's were used on each of the variables to examine the evaluation of the interventions. Where statistical significance was found, a post-hoc Scheffe test was conducted to determine the specific differences among the groups. Table 9 illustrates the results of this evaluation. In Table 9, common letters between two social support groups mean the difference between them was significant.

Table 9

Means and Standard Deviations of Subjects' Evaluation of Treatment Groups on Selected Variables

	Relapse Prevention	Buddy	Phone
Beneficial			
M	3.71[BB]	2.65[B]	2.67[B]
SD	.47	1.06	1.05
Helpful			
M	2.35[A]	3.24[A]	3.04
SD	.61	.97	1.16
Enjoyable			
M	3.53[A]	3.12	2.79[A]
SD	.80	.93	.93
Nuisance			
M	2.59	2.53	2.63
SD	.87	.80	1.10
Discuss experience			
M	3.65[B]	2.63[B]	3.04
SD	.79	1.02	1.12
Help through hard times			
M	3.24	2.75	2.67
SD	.90	1.13	.92
Made attending more difficult			
M	1.94	2.56	2.05
SD	.66	.96	.74
Made me accountable			
M	3.82[B]	2.50[B]	3.17
SD	.81	.99	1.03
Helped me keep track			
M	3.12	2.53	3.00
SD	.78	1.06	1.17

A=p<.05
B=p<.01
C=p<.001

Several observations can be made from Table 9. First, overall, the relapse-prevention group generally agreed that the meetings were beneficial and enjoyable. However, some subjects did find the meetings to be somewhat of a nuisance. These same subjects also found that the R-P meetings were a good place to discuss their exercise experiences, and they felt the meetings helped them maintain more regular attendance by making them accountable and getting them through times when it was especially difficult for them to attend aerobics.

The subjects in the telephone contact group found the phone calls to be helpful but not particularly enjoyable. Like the R-P group, they felt that the phone calls helped them by making them accountable and by providing a place for them to discuss their exercise experiences. They, too, though, felt that the phone calls were also a bit of a nuisance.

Finally, the subjects in the buddy group were the least positive in their evaluation of the intervention. They did not believe that it was helpful and were generally neutral in their view of how accountable and enjoyable it was for them compared to the other treatment groups. In follow-up discussion, subjects said they did not feel that being paired with an exercise partner was a good way for them to discuss their experience, especially since most did not know their partner prior to this intervention.

In summary, most of the significant differences occurred between the relapse-prevention group and the buddy group, especially when asked to determine if the respective

intervention was beneficial or held them accountable. The subjects in the relapse-prevention group were much more positive about their overall evaluation of the social support treatment they received than were the subjects in the buddy group. This is evident from the overall higher scores given to the positive variables (i.e., beneficial, helpful, enjoyable, good place to discuss exercise experience) by subjects in the relapse-prevention group.

To determine if other support was provided to the subjects outside of the study, subjects were asked to give their perception of significant people (i.e., parents, significant other, physician, exercise partner, friends, work colleagues, and supervisor) in their lives in terms of the support given them regarding exercise participation. Subjects were asked on a Likert scale (1 = very negative to 4 = very positive, or 0 = no support received) to give their perception of the type of support they received from these people in their lives. Anova results in Table 10 illustrate that there were almost no significant differences between the treatment groups and the support they received from these people. The only statistically significant difference was in the amount of support received from an exercise partner. Table 11 reports the means and standard deviations of perceived social support by the treatment groups.

Table 10

ANOVA Results for Social Support Received from Others by Treatment Groups and Self-efficacy Groups

Social Support	ss	ms	df	f	p
From parents					
Treatment group	8.410	2.803	3	1.553	.208
Self-efficacy	1.432	1.432	1	793	.376
From significant others					
Treatment group	12.506	4.169	3	1.576	.203
Self-efficacy	2.258	2.258	1	.854	.359
From physician					
Treatment group	5.962	1.987	3	1.239	.302
Self-efficacy	.063	.063	1	.039	.843
From exercise partner					
Treatment group	29.710	9.903	3	3.921	.012*
Self-efficacy	1.664	1.664	1	.659	.420
From friends					
Treatment group	4.875	1.625	3	.892	.449
Self-efficacy	.056	.056	1	.031	.861
From work colleagues					
Treatment group	4.778	1.593	3	.779	.510
Self-efficacy	.122	.122	1	.059	.808
From boss/ supervisor					
Treatment group	5.076	1.692	3	.961	.416
Self-efficacy	.087	.087	1	.050	.825

*p<.05

Table 11

Means and Standard Deviations for Social Support Received from Others by Treatment Groups

	Relapse Prevention (n=21)	Buddy (n=18)	Phone (n=21)	Control (n=20)
From parents				
M	3.20	2.42	2.52	2.67
SD	.95	1.54	1.41	1.24
From significant others				
M	2.40	2.53	2.17	1.57
SD	1.67	1.61	1.67	1.60
From physician				
M	.95	.16	.70	.76
SD	1.43	.69	1.36	1.41
From exercise partner				
M	2.50	.67	1.52	1.67
SD	1.54	1.28	1.65	1.65
From friends				
M	2.80	2.79	2.30	2.62
SD	1.28	1.08	1.46	1.40
From work colleagues				
M	.75	.47	1.04	1.05
SD	1.37	1.12	1.64	1.53
From boss/ supervisor				
M	.55	.73	.74	1.05
SD	1.15	1.45	1.45	1.53

ANOVA results also showed that there were no significant differences in the amount of perceived support between the low and high self-efficacy groups. Table 12 reports the means and standard deviations for the perceived social support received from other people by subjects high and low in self-efficacy.

Overall, results indicated that subjects believed they received positive support from people in their lives, or they did not receive any support. No one reported receiving any negative support for their participation at aerobics sessions during the semester.

Table 12

Means and Standard Deviations for Social Support Received from Others by High and Low Self-efficacy Subjects

	High Self-efficacy (n=38)		Low Self-efficacy (n=43)	
	M	SD	M	SD
From parents	2.53	1.30	2.84	1.36
From significant others	2.29	1.54	1.98	1.75
From physician	.58	1.20	.67	1.34
From exercise partner	1.76	1.57	1.56	1.72
From friends	2.63	1.32	2.58	1.33
From work colleagues	.79	1.34	.86	1.52
From boss/ supervisor	.71	1.29	.74	1.40

Finally, subjects had disclosed at the beginning of the study how often they planned on attending aerobics per week. They were given the options of once a week to five times per week. A 2 X 4 (self-efficacy by treatment group) Anova revealed that there was a significant difference between the high and low self-efficacy groups, $F(1,85) = 17.361$, $p < .001$. The means and standard deviations in Table 14 revealed that, overall, subjects stated they planned to attend aerobics an average of 3.30 (SD = 1.13) sessions per week (N=84). The high self-efficacy group planned to attend aerobics an average of 3.81 (SD = 1.12) sessions per week. The low self-efficacy subjects planned to attend an average of 2.76 (SD = .86) sessions times per week. The ANOVA results are presented in Table 13. No other significant differences were found.

Table 13

ANOVA Results for Stated Goal for Attendance by Self-efficacy and Treatment Group Prior to Treatment

	ANOVA Results				
Main Effects	ss	df	ms	f	p
Self-efficacy	18.719	1	18.719	17.361	.000*
Treatment Group	.876	3	.292	.271	.846
Interaction	2.485	3	.828	.768	.516

*p<.001

Table 14

Means and Standard Deviations for Stated Goal for Attendance by Self-Efficacy and Treatment Group Prior to Treatment

	Relapse Prevention	Buddy	Phone	Control	Total
Low self-efficacy					
M	3.11	2.73	2.60	2.64	2.76
SD	.78	1.01	.97	.67	.86
N	9	11	10	11	41
High self-efficacy					
M	3.83	3.44	4.08	3.80	3.81
SD	1.03	1.13	1.16	1.23	1.12
N	12	9	12	10	43
Total					
M	3.52	3.05	3.41	3.19	3.30
SD	.98	1.10	1.28	1.12	1.13
N	21	20	22	21	84

When asked how often participants actually did attend per week, some differences emerged. The difference between the two self-efficacy groups remained significant, $F(1,85) = 11.591$, $p < .001$, and the results of the 2 X 4 ANOVA are shown in Table 15. As it was prior to the treatment, there were significant differences among the social support groups regarding how often they stated that they had attended aerobics, $F(3,85) = .477$, $p > .05$. Results in Table 16 reveal that, overall, subjects stated that they actually attended an average of 2.35 (SD = 1.07) sessions per week. The high self-efficacy subjects attended an average of 2.71 (SD = 1.11) sessions per week, while the low self-efficacy subjects attended an average of 1.92 (SD = .84) sessions per week. Both groups actually attended less than their self-stated goal.

Each of the treatment groups and control group also attended less than they had planned. The R-P group had the highest attendance with an average of 2.57 (SD = 1.08) sessions, and the partner group remained the lowest in attendance with an average of 2.18 (SD = 1.11) sessions per week. There was also no significant interaction between self-efficacy and treatment groups $F(7,85) = .209$, $p > .05$.

Table 15

ANOVA Results for Stated Goal for Attendance by Self-efficacy and Treatment Group After Treatment

	ANOVA Results				
Main Effects	ss	df	ms	f	p
Self-efficacy	12.115	1	12.115	11.591	.001*
Treatment Group	1.497	3	.499	.477	.699
Interaction	.655	3	.218	.209	.890

*p<.001

Table 16

Means and Standard Deviations for Stated Goal for Attendance by Self-Efficacy and Treatment Group After Treatment

	Relapse Prevention	Buddy	Phone	Control	Total
Low self-efficacy					
M	2.11	1.63	1.89	2.00	1.92
SD	.78	1.06	.60	.94	.84
N	9	8	9	10	36
High self-efficacy					
M	2.92	2.75	2.50	2.70	2.71
SD	1.16	.89	1.24	1.16	1.11
N	12	8	12	10	42
Total					
M	2.57	2.19	2.24	2.35	2.35
SD	1.08	1.11	1.00	1.09	1.05
N	21	16	21	20	78

A Kruskel-Wallis test was performed to determine if there were significant differences between self-efficacy groups or treatment groups with respect to their perceived frequency of attendance. Subjects were asked if they attended aerobics more often, less often, or as often as they had planned. There were no significant differences among the treatment groups, $X(3) = 2.16$, $p > .05$. There was not a statistically significant difference between the high and low self-efficacy groups on planned attendance either, $X(1) = .21$, $p > .05$. Overall, 59 of the 86 subjects reported that they attended less often than they had planned. Twenty-one subjects said they actually attended as often as they had planned, and 6 subjects attended more often than they had planned.

For further understanding, subjects answered an open-ended question regarding the main reason for not attending aerobics on any given day. Table 17 shows the most frequently cited reasons for not attending aerobics were "homework" and "hectic schedule." Other reasons that were often given included "injury," "illness," "important meetings," and "being bored" with aerobics.

Table 17

Frequency of Subjects' Reasons for Missing Aerobics

Reason	Frequency
Homework	23
Hectic Schedule	22
Illness	10
Injured	10
Tired	7
Meetings	7
Bored with aerobics	4
Lazy	3

Summary

The results of the present study gave support to the hypothesis that those with higher self-efficacy will attend aerobics sessions more frequently. Subjects with higher self-efficacy did, in fact, attend aerobics more often than those with lower self-efficacy. However, social support did not seem to affect attendance in any statistically significant way. There was also no significant interaction effect between social support and self-efficacy.

The evaluation of the social support intervention by the subjects was varied. Subjects in the relapse-prevention group generally liked the meetings, and did not find them to be a burden. For the most part, subjects in the group thought the meetings were a good way to be accountable and learn valuable information regarding health and exercise. Likewise, the subjects in the telephone contact group believed that the weekly calls were beneficial, particularly as a way to be

accountable for exercise attendance and as a way to talk about their exercise experiences. The subjects in the buddy group were the least favorable regarding their social support intervention. They did not find that having a "buddy" was helpful, particularly since the majority of them did not know the person with whom they were paired. However, they also did not believe that having a "buddy" made it more difficult to attend aerobics sessions.

Even though most subjects believed the social support interventions were helpful, they did not believe it made much difference regarding their own individual attendance to the exercise sessions. Most subjects reported having adequate social support from other sources, including attending sessions with at least one other person.

Finally, subjects did not attend aerobics as often as they had anticipated during the semester. Subjects in all treatment groups and the control group set lower goals of attendance for themselves at the end of the semester as compared with their self-stated goals at the beginning of the semester. Reasons for missing aerobics sessions were varied, but lack of time, homework, and illness or injury were the most frequently mentioned. The importance and implications of these findings will be discussed in the next chapter.

Chapter Five

DISCUSSION

The purpose of the present study was to examine the role of social support in exercise adherence and the relationship between self-efficacy and exercise adherence. The study investigated the effects of imposed social support as a way to increase adherence to a program of aerobic exercise, and the influence of self-efficacy on attendance at aerobics sessions.

Several conclusions and speculations will be made in this chapter in connection with the findings from the data. For instance, self-efficacy seems to be a critical component of exercise adherence, perhaps even more than was previously thought. Existing research is beginning to acknowledge the importance of self-efficacy, and the present study supports this theoretical emphasis. In fact, consideration may be warranted for self-efficacy to be given a greater role in the intervention level of exercise adherence, even greater than the construct of adherence itself. Self-efficacy could possibly be thought of as the underlying problem, and that there has been an overemphasis on the "symptom" of poor adherence to exercise programs. This chapter will also discuss the results in light of existing theories and research conducted in this area. Contributions of this study to exercise adherence literature will also be discussed. Finally, implications for counselors working with clients on exercise adherence, educators, and exercise instructors will

be presented.

The main hypothesis of this study was that various types of social support would have a significant and positive effect on the frequency of a subject's attendance at aerobics sessions. This hypothesis was not supported. To account for this, the types of social support used in this study will be discussed individually to help explain why the desired outcome did not occur.

The relapse-prevention model has been used occasionally to examine exercise adherence (King & Frederiksen, 1984; Martin, et al, 1984). Because few studies have used this model, it is largely an untested theory with respect to exercise adherence. In the present study, many of the suggested techniques, educational topics, and relapse prevention materials were utilized. Among the more successful techniques for enhancing adherence, determined by subjects in discussion following the study, were (a) identifying difficulties in adhering to exercise and predicting high-risk times during the semester, (b) keeping track of attendance, (c) relaxation training, (d) cognitive restructuring, and (e) gaining knowledge about nutrition (which was presented as a coping mechanism to prevent a total relapse from aerobics attendance).

A recommended, although not a mandatory, aspect of the relapse-prevention model was the planned lapse. Unfortunately, in this aerobics program, it was very difficult to monitor and ensure that subjects had, in fact, carried out

a planned lapse. The reason for the difficulty was that aerobics were offered several times during the week as well as several times during the day. Subjects who "lapsed" could easily "make-up" a session without many days of missed attendance. On the other hand, many subjects did experience a "lapse" during midterm exam week and several subjects in the relapse-prevention group did miss several days of aerobics. Most were able to return to aerobics without much difficulty. Many said that the weekly relapse-prevention meetings and the commitment to attend these meetings, as well as the information gained from attendance, provided nice "insurance" for them in that they would at least be attending one aerobics session per week.

The fact that aerobics sessions were offered so frequently is an important point to consider here. Other studies utilizing the relapse-prevention method as an intervention for exercise adherence did not have exercise sessions at such a high frequency rate. This contributes to the difficulty of comparing this study with those that have been conducted using the relapse-prevention method, as most other studies have used aerobics classes that meet at set times and on a predetermined number of days. Subjects in this study could attend aerobics sessions anytime as often as they liked.

The exercise buddy group was the least successful in terms of impacting the subject's aerobics attendance. One potential reason for this outcome, speculated by the

researcher, may be that they did not know the exercise partner that was assigned to them, and thus, found it difficult to maintain contact with their partners beyond one or two weeks into the semester. This was confirmed by the subjects in an open-ended question answered at the end of the study. Many of them stated that they had little desire to maintain contact with someone they did not know already. Also, they believed the intervention would have been helpful if they had known their exercise buddy. However, this does not explain or account for why these subjects still had the lowest attendance of the groups including the control group. The comparatively poor attendance in the buddy group is especially difficult to explain since subjects in the buddy group were just as likely as members of the other groups to attend or not attend with someone else on a regular basis.

Members in the telephone contact group were generally positive about their experience. They viewed the phone calls as a way to be accountable to someone in terms of their attendance, and a way to discuss how they felt about their own exercise progress. However, like the other social support groups and their respective social support interventions, subjects in the telephone contact group did not think that the telephone calls made any significant difference in their attendance at aerobics sessions during the semester.

Several reasons exist that could explain why subjects reported that the social support interventions did not affect their attendance at aerobics sessions. One of the most

important reasons is that the subjects in this study already seem to have had adequate social support availbable to them if they wanted it. Most subjects (63%) reported that they attended with at least one other person. As this statistic includes subjects in all four groups, it seems that social support was already available to most participants in this college setting. Intuitively, this makes sense as well. Most college students have roommates and/or live in a housing arrangement with several people nearby, as in a residence hall or apartment complex. The opportunity to exercise with someone else is very great in the university setting. The theory of reasoned action (Azjen & Fishbein, 1980) suggests that normative beliefs of friends and peers holds a very strong influence and may contribute to the support important for some in maintaining an exercise program. That is, friends' values of physical fitness may provide sufficient support for someone to attend aerobics. Following this logic, it might be concluded, then, that the interventions used in this study may have been redundant for this population.

Another potential reason for failure of the interventions to impact the subjects could be that college students' access to aerobics and other forms of physical activity is very high. Students have many more options than an older population that is trying to adhere to an exercise program. For example, intramural sports programs, on-campus weight rooms and exercise equipment are relatively close, and are free or inexpensive. Organized aerobics sessions are offered everyday

and even several times per day. Thus, students are exposed to many exercise alternatives and physical activity has a "built-in" social component to it from the beginning. Because of the many exercise alternatives, the social support interventions in this study may not have been sensitive enough to distinguish among the three treatment types and control group. Outside of the university setting, people are not so frequently exposed to exercise options that encourage socilization and camaraderie. Also, work schedules are not as flexible as those found in the university setting, further limiting the options available to other populations.

In contrast to the first hypothesis, the contention that those with higher self-efficacy would attend more aerobics sessions than those with lower self-efficacy was strongly supported. The results were consistent with previous research in that those who believed they could exercise with great regularity, and at fairly constant intensity and duration, attended more often than those who did not believe this about themselves.

This study also supported the suggestion within self-efficacy theory that those who expect success in relationship to their goal will more likely succeed at this goal. In this study, higher self-efficacy subjects not only predicted that they would attend more sessions than those with lower self-efficacy, they perceived that they actually did attend more aerobics sessions during the semester. This directly relates to self-efficacy theory in that it is the self-efficacy

expectancies that seem to have the "more powerful influence on behavior" (Maddux, 1993).

Results from this study confirm the importance of self-efficacy expectancies. Expectancies seemed to have a relationship with the overall efficacy of the subjects in this study regarding their belief that they could attend aerobics a certain number of times per week over the course of a semester. While subjects with higher self-efficacy did expect to attend more often than those with lower self-efficacy, subjects in all treatment groups lowered their self-stated goal at the end of the semester, stating that they would attend fewer times per week.

The lower expectancies of the subjects can be considered in two ways. First, subjects' high expectancies at the beginning of an exercise program may be unrealistic and may contribute to a self-efficacy that remains low over the course of an exercise program. Current research in self-efficacy and exercise adherence has focused primarily on how to increase adherence to exercise programs as a way of helping increase self-efficacy. While this is a necessary approach and has proven valuable in helping individuals maintain adherence to exercise, another method to increase self-efficacy is to make sure individuals are not "sabotaging" their own adherence efforts with unrealistic goal-setting. That is, more emphasis should be given to increasing self-efficacy first, and then focusing on increasing exercise adherence. This focus on self-efficay is beyond the scope of the results of this study,

but may be helpful in future research.

Secondly, lower expectancies reported at the end of the semester than at the beginning of the semester also point to a theoretical issue within exercise adherence that has yet to be resolved. The issue revolves around the definition of adherence itself. Researchers, such as Dishman (1988) and Martin and Dubbert (1985), have suggested that true adherence cannot exist unless the exercise is performed at the level prescribed by the exercise program or physical performance during exercise is somehow sufficient to reach adequate intensity and duration levels.

Perhaps adherence can be conceptualized in another way, one that, although certainly not disregarding the importance of adequate intensity and duration of exercise to obtain cardiovasular benefits, focuses more on the goals of the individual who exercises. Studies have not considered defining adherence in terms of the self-stated goals of the individuals who participate in an exercise program. Research has shown that there are many reasons why people exercise and these same individuals probably set their own goals accordingly.

By not taking individual goals into consideration, researchers are neglecting an important issue within adherence research. For example, if individuals attend aerobics sessions in order to relieve stress, or to socialize, or even to avoid doing homework, they may not consider adequate intensity level, so important in exercise adherence research,

a vital component within their own exercise goals. A slightly different view of exercise adherence, then, could be consistent attendance over time, in relationship to what the individual participants want for themselves. Thus, while more closely matching individuals' motives to exercise with outcome expectancies, a different result regarding adherence may emerge.

In the present study, most subjects in all groups attended aerobics sessions less often than they had initially planned. However, subjects also adjusted their attendance goals at the end of the semester, to make them more realistic within their own schedules. Also, most subjects did continue attending the aerobics sessions for the entire semester. Thus, with the proposed change in the definition of exercise adherence, most subjects could still be considered adherers to their own planned exercise program.

The individuals who would benefit from this different perspective of exercise adherence are those with lower self-efficacy. By allowing for a more individualistic definition of adherence to exist, those with lower self-efficacy might be better able to raise their level of exercise self-efficacy, rather than have a certain criteria imposed on them that would do nothing to increase, and possibly hurt their already low self-efficacy. Thus, by taking away some of the emphasis from adherence, more attention would ideally be given to increasing self-efficacy in exercise situations.

There was no support for the third hypothesis, which

suggested that there would be an interaction effect between self-efficacy and social support. As was reported in the previous chapter, those with the most self-efficacy and the most social support provided by the study, did not attend significantly more aerobics sessions than the others who received less social support and whose self-efficacy was not as high.

One reason for this finding may be found in the social support literature. Namely, those with high self-efficacy may not need social support to keep them involved in exercise, and/or they may know how to make enough use of existing social support, and/or find it on their own if they believe it will enhance their exercise experience or regimen in some way. In other words, there may be a ceiling effect regarding social support, where any additional provided social support is superfluous and largely unnecessary. For those with lower self-efficacy, greater attention should be given to individuals starting an exercise program, so that expectancies and desired outcomes are clearly understood before an intervention is provided.

Other important factors to consider in the area of exercise adherence are the reasons subjects gave as to why they do not attend aerobics. This is important because the very reasons provided by subjects may be indicators for researchers as to where further study and effort needs to be given in the area of exercise adherence. Knowing specifically why people fail to adhere (or at least the excuses given!) to

exercise may provide information as to where future intervention should be focused. In what are subjects choosing to participate, if not aerobics? How is this time being spent?

The reasons subjects gave for missing aerobics sessions on any given day are closely related to the college setting, as one would expect. These answers should assist researchers in finding the appropriate intervention for any given population, and, indeed, that was the case in this study. Subjects felt that lack of time because of schoolwork most often kept them from exercising. On one hand, this could be viewed positively, in that subjects are setting appropriate priorities. However, this could be used as a point of future intervention in that time management and a potentially positive habit-formation process seems to be lacking in this population, especially regarding exercise. Future research should consider teaching time management skills as an alternative intervention strategy, and should assess its effect on one's stated goal for exercise or attendance

Perhaps most importantly, this study confirms the direction in which exercise adherence is now headed. The results of this study point to a multiple intervention/multi-theory approach in helping assist others' exercise adherence. This has been presented as a theoretical view by many researchers, and is gaining widespread acceptance (Brawley, 1993; Poag-DuCharme & Brawley, 1993). This present study lends support for the multi-intervention/multi-theory concept.

First of all, the incorporation of habit-forming techniques, specifically situational cues that can be brought to one's awareness, could serve as one aspect of the approach. Habit-formation, while not yet a strong theory on its own in exercise adherence research, has many similarities with cognitive-behavioral approaches to behavioral and lifestyle changes.

Habit-formation has been given little attention in the exercise adherence literature. However, the potential benefit of habit-formation is very great and should be given greater attention in future research. To help explain and develop the idea of habit-formation in exercise, Maddux (1993) has suggested the incorporation of habit theory into existing models of exercise adherence, often in the form of situational cues. By combining the social cognitive processes that are emphasized in self-efficacy theory, people could also learn to develop situational cues that could strengthen the habit formation and decision-making process used by individuals when deciding whether or not to exercise on any given day.

An example of the concept of habit-formation can be seen in relationship with the relapse-prevention model. Habit-formation would be an easy addition and enhancement in the relapse-prevention intervention. For instance, in the relapse-prevention meetings, there could be a discussion about cues that discourage exercise adherence and those that encourage exercise adherence. For example, subjects may talk about the difficulty to exercise after attending academic

classes. When subjects return to their dorm rooms, temptations (e.g., T.V., friends, the telephone) could be enough to distract them from attending aerobics. Discussion could then lead to how subjects could alter their own environments to make exercise more attractive or to remind themselves of it, such as laying out their workout clothes before leaving their room, or even taking their clothes with them. To date, habit-formation has been used somewhat in relapse-prevention, but not in a systematic or consistent fashion, and has not been researched as a specific and necessary component of relapse-prevention.

Similarly, habit-formation could also be incorporated into phone calls and in working with an exercise partner. In the telephone contact group, informal conversation could include tips and suggestions about what cues might help that particular subject in her attempts at adhering to an exercise program. After learning about situational cues via a handout or initial meeting, partners could provide this same type of support and sharing of information with each other. Secondly, since self-efficacy theory continues to successfully differentiate those who attend more often with those who do not, intervention should focus on this important variable. However, the results of the present study would suggest that self-efficacy expectancies should be given greater emphasis as a point of intervention, rather than just a predictor of who is more likely to adhere to an exercise program.

Thus, another important theory of the multi-

intervention/multi-theory approach to exercise adherence is self-efficacy theory. Because self-efficacy has been shown to be such a strong predictor of adherers, it is time to focus on ways to increase self-efficacy more directly in exercise settings. As stated earlier, previous intervention has given too much emphasis on how to increase adherence and not acknowledging that by increasing self-efficacy first, it is likely that greater exercise adherence will follow.

Self-efficacy is most successfully applied in specific forms and this should be taken into consideration when developing an intervention designed to increase self-efficacy. In other words, to help the self-efficacy of people increase in the exercise adherence domain, fitness instructors should look at the barriers identified by their students and focus on these when determining goals for individual exercise participants. The emphasis should, thus, be on increasing self-effficacy, and not merely increasing exercise adherence.

While the findings of this study were intended to provide a greater understanding of exercise adherence and the role social support contributes to this process, several other demographic and methodological factors must be considered in evaluating the results. One factor is the generalization of these findings to other populations. The sample population for this study was college students who voluntarily participated in aerobic exercise sessions. Generalization of the findings to those college students who do not attend aerobic sessions, but engage in exercise activity alone or

with others, may not be appropriate. Those students who use forms of exercise other than organized aerobics classes may be gaining the same physical and psychological benefits, such as cardiovascular conditioning and improved feelings of well-being, as those who attend organized classes. Therefore, not all college students would benefit from or desire an imposed form of social support for their exercise activity, and may not require social support for adherence to their exercise activity, e.g., running.

College students are also somewhat unique by coming from families with an income level that makes college possible, by having a sufficiently high intellectual level, and by typically being in the 18-22 age group. The relatively unstructured atmosphere of academia allows for college students to be more flexible in scheduling their time. Therefore, it may be easier for a college student to regularly attend an exercise class than people who are not students or who are students but also work.

College aerobic classes at the two settings were also usually attended by many more females than males. Women may utilize social support differently than men, and although this issue was not part of this present study, results may have been affected by an all-female population. This provides a further limit to the generalizability of this study.

Finally, proximity and convenience of the exercise setting may differentiate the subjects in this study from individuals who have to travel to attend their exercise

program. Therefore, proximity to the exercise setting should also be considered when analyzing the results of this study.

Many college students engage in exercise activities such as running, walking, using video exercise tapes, etc. Students' adherence to participation may or may not be affected by various types of social support, particularly if they prefer to exercise alone. Participation in these alternative forms of exercise does not require as much social interaction as those in an organized aerobics class, so social support may not be relevant to those persons who engage in these exercise forms. Results from this study of organized exercise classes and imposed social support may not apply to those that exercise via other forms than organized classes.

There were several potential confounding factors that did not, fortunately, seem to alter the results of the study. For instance, subjects had contact with each other and may have discussed the different interventions among themselves. This might have compromised the different treatments and caused diffusion or imitation of treatments. Subjects in one intervention group may have inadvertently begun a form of social support that is similar to another group's intervention. For example, subjects in the telephone contact group may decide to attend exercise classes with a friend or small group. Benefits gained from this could be similar to those benefits gained from the buddy-system group. In this way the uniqueness of the groups may be compromised. In order to minimize the effects of diffusion of treatment,

randomization to the intervention groups was done. After informal conversation with the subjects, it was noted that a few were aware of other interventions occuring. However, the degree to which they cared or thought about this was very small. More likely, as mentioned before, similarity to the interventions occurred naturally, with subjects often attending aerobics with friends or getting support for being physically active from their already existing social group.

Another factor that is related to the diffusion of treatments is the "compensatory rivalry by respondents receiving less desirable treatments" (Kirk, 1982, p. 23). If subjects among the groups discovered the type of social support another group was receiving, subjects may be motivated to try harder to attend or decide to attend classes less often if they were upset about their intervention. For example, subjects in the telephone contact and "buddy" system groups may be upset that they are not receiving the extra instruction that the relapse-prevention group is receiving. Again it is believed that although this was a possibility, results were not altered in any way because of this. Most students were so busy and their schedules so full, little attention was given to the study by the subjects outside of weekly contact or when they filled out questionnaires. It is, thus, highly unlikely that subjects were anything more than possibly aware of a few of their friends doing something different in relationship to this study. It did not appear that any of them felt slighted or neglected because of a different intervention being given

to someone else.

Finally, the voluntary nature of this study should also be considered. Subjects were not required to participate in the exercise class or be a subject in this study. Subjects who volunteered for this study may have already been more motivated to succeed in an exercise program than those who did not choose to participate in the study. Subjects' levels of self-efficacy may have also been higher than those who were not in the study and the chances for success in relation to adherence may have been greater from the outset of the aerobics class.

Implications for Research

Upon consideration of the results and the limitations of this study, there are still many implications that can be applied to the difficult task of increasing people's exercise adherence. Perhaps most importantly, this study points to the often overlooked importance of applying appropriate interventions to the population in question. This study did not refute the importance of social support for exercise adherence. It merely highlighted the fact that social support "built-in" to an exercise program may not be necessary or even desirable for all populations.

Secondly, this present study, like so many before, have consistently demonstrated the value of self-efficacy in helping people maintain exercise regimens. It is yet to be determined just "how much" or "how high" self-efficacy has to be in order for one to feel confident enough in their

abilities to "stick with" exercise.

Social support remains an important factor in exercise adherence and should be incorporated into future studies with more regularity. Although the imposed social support provided by the interventions in this study did not yield significant changes in attendance, nor did most subjects believe it a had a very strong impact on their attendance, social support was very evident in the lives of the subjects. Most of the subjects did attend aerobics with at least one other person and this was important to them. As McAuley (1992), Rejeski (1992), and Wankel (1988) have suggested, social support and its effects remain largely unexamined. It is still not certain how social support interacts with or moderates other variables related to exercise adherence such as self-efficacy or intent to exercise.

Research that examines the relationships of concepts derived from many different theories is a vital and necessary next step in the study of exercise adherence. This can be done in many different ways. Some studies have examined several different concepts in one study, and examined their usefulness in explaining the variance of adherence and drop-out rates in exercise (McAuley & Courneya, 1993; Rodgers & Brawley, 1993). The present study took another approach and took one concept that is present in several theories (social support) and attempted to examine it more closely as an individual factor and in connection with another factor that has proven to be very important in the area of exercise

adherence. Both methods point to the need for a multi-theory approach to examining exercise adherence. No one theory has been successful in explaining why people adhere or do not adhere to exercise programs. By combining theories, particularly the components of the theories that have been shown to account for variance in past studies, the potential for finding what truly explains exercise adherence is more likely to be found.

In a recent theoretical work by Brawley (1993), further evidence is provided as to why a multi-theory approach is the most viable at this time. He argues that more is to be gained from exploring complementary and similar aspects of theories, rather that testing them against each other. He suggested combining aspects of the theory of reasoned action, the theory of planned behavior, and self-efficacy theory as a way to further understand exercise behavior. As stated before, looking at any one individual theory, or pitting theories against each other has not been successful. Thus, he suggests looking at existing theories in new and innovative combinations.

The present study also made evident the need for greater understanding of the exercise setting when future field experiments are conducted. For example, data collected in this study about subjects' involvement in other forms of exercise showed that college settings allow subjects to participate in many different types of physical activity. This is certainly not true for all settings. Other research

conducted at universities has not focused on this as a possible reason for not attending aerobics sessions.

Future research should include a systematic means by which subjects can report other physical activities and be analyzed closely with reasons subjects give for not attending aerobics sessions. For example, subjects may state that they quit attending because they were bored with the instuctor's routine. If they switched to another form of exercise, many different conclusions would be made than if the subjects dropped out because they were bored with the instructor's routine, but did not continue exercising anywhere else. Data such as these could provide information regarding the direction that future interventions should take to increase adherence.

Finally, it has been suggested that the definition of adherence be reevaluated. By not taking into full account the individual's motive and goals for exercise participation, researchers have possibly missed a crucial link between self-efficacy, expectancies, and adherence. Subjects in this study lowered their expectancies regarding exercise adherence when they discovered they could not maintain their original attendance goal. Presumably, this helped subjects maintain a certain level of self-efficacy regarding exercise that may have been beneficial or detrimental to the individuals involved. Future research could help examine this phenomenon in greater detail and provide information that, again, could mean more appropriate initial, as well as remedial

intervention, regarding exercise adherence.

Implications for Educators and Practitioners

As mentioned earlier, this study suggests that intervention should more closely be determined by assessment of the specific population. In this study, social support was provided that may have been largely redundant and/or more burdensome than subjects were willing to incorporate as an adherence strategy for themselves. Those who work with individuals in exercise programs should be very aware of the existing obstacles, as well as positive resources, available to their students, which may help or hinder exercise adherence. Interventions should be developed and applied accordingly.

For example, in working with college students, an appropriate intervention may be to focus on students' self-efficacy as it directly relates to their exercise and physical activity experience. During the self-efficacy assessment period, a short class or "mini-lecture" could be given that would assist students in knowing how to gradually develop an exercise program in which they can be successful, and to set realistic goals which will build the number of success experiences in exercise settings, so that self-efficacy will begin to increase as confidence due to success goes up.

Self-efficacy is most successfully altered in specific settings and this should be taken into consideration when developing an intervention designed to increase self-efficacy. In other words, to help the self-efficacy of people in the

exercise domain, fitness instructors should look at existing factors identified by their students as resources on which to help facilitate an improvement in self-efficacy. The focus should be on these resources when determining goals for individual exercise participants. An example of a resource on which to build self-efficacy might be the participation in previous exercise program, or past involvement in some other form of physical activity, such as organized sports. Instructors should also assess existing barriers that keep individuals from exercise programs and work with individuals to eliminate them, as yet another way to improve exercise self-efficacy. By focusing on how to increase self-efficacy, motivation can be maintained, and, thus, adherence to the desired behavior is more likely to continue.

Instructors should ask their students or clients the reasons they do not, or might not attend on any given day, at the beginning of the program. Again, this information could then be incorporated into an exercise adherence intervention that is meaningful for the individuals involved. Thus, interventions designed to improve adherence need to be flexible enough to apply to a wide range of people.

Another example from this study is that students often cited lack of time, particularly due to schoolwork, as a major reason why they skipped aerobics sessions. Lack of time could be addressed in helping students develop not only a "good habit," but also with their development of time management skills. This is something that could be discussed in a very

short meeting at the beginning of the school year. If this was still too time-consuming and impractical, handouts could be provided that could disseminate the information at the first aerobics sessions of the school year.

Summary

Exercise adherence remains an important subject to study, especially because of the continued overall poor physical condition of individuals in our country. Many theories exist that have explained a portion of the variance of adherers versus dropouts and have had minimal to moderate success in predicting who will adhere to an exercise program. This study points to the importance of a multi-theory/multi-intervention approach as a way to increase exercise adherence. By conceptualizing exercise adherence in many ways it becomes more likely that researchers will find the essential and most critical components that explain exercise adherence. By providing multi-interventions to individuals in exercise programs, it becomes more likely that appropriate interventions will be given to specific populations and, thus, more people will be adequately served in this important aspect of their lives.

This discussion has also provided suggestions for researchers and practitioners to carry out the multi-theory/multi-intervention approach. In research, the suggestion was made to conduct studies that combine various pieces from differing theories to help better explain exercise adherence. Another suggestion was to conduct other studies

such as the present study that takes a single concept, like social support, that exists in some form in several different theories, and explore it in greater detail.

Finally, it should be noted that exercise adherence research has reached a plateau and is just beginning to move to the next level. The success of several theories, particularly self-efficacy theory, has contributed to substantial movement toward the goal of understanding the deceptively complex concept of exercise adherence. The present study is a contribution to the goal of understanding exercise adherence, and hopefully another step to helping improve exercise adherence in the lives of people.

Appendix A

Description of Study and Consent Form

I am a student pursuing a PhD in Counseling Psychology. I have a special interest in exercise and health psychology. For my dissertation, I am conducting a study on people's exercise behaviors.

I am asking for the cooperation and assistance of college students that attend aerobics classes at Bradley University/Illinois State University by taking part in my study. Participation will involve taking a paper-and-pencil survey within the next week that will take about 20 minutes to complete.

In December, another paper-and-pencil questionnaire will be completed. In addition, weekly involvement may take 20-30 minutes immediately before or just after an aerobics class session to discuss your exercise experience. Participation will help increase the understanding of exercise behavior.

All of your answers will remain confidential. Participation in this study is voluntary. You may withdraw from participation without penalty or prejudice at any time. Results from this research will be available to you upon request.

If you are willing to participate, please read and sign the consent form below and write your name and phone number at the bottom of this page.

- -

By signing this form, I understand that I am giving consent to voluntarily participate in this research. I understand that I may discontinue my participation at any time and that my answers will remain confidential.

Signature _____

Print Name_____

Address_____

Phone Number _____

What day(s) do you plan on attending aerobics? _____

Appendix B

THANK YOU FOR PARTICIPATING IN THIS STUDY!! YOUR ASSISTANCE AND COOPERATION WILL HELP RESEARCHERS IN EXERCISE SCIENCE BETTER UNDERSTAND THE EXERCISE BEHAVIORS OF INDIVIDUALS SUCH AS YOURSELVES.

Please read each set of instructions before you answer a set of questions. I hope you will find this an interesting survey to complete. Thank you again for your participation during this semester!

Name _____ **Phone No.**_____

School Address_____

How often did you participate in the following physical activities during the past year?

	Never	Rarely (less than 1x/mo.)	Sometimes (1-2x/mo.)	Frequently (3-4times/ mo.)	Often (1-3x/ wk.)	Very Often (4-6x/ wk.)	Daily
Aerobics	0	1	2	3	4	5	6
Bicycling	0	1	2	3	4	5	6
Rollerblading	0	1	2	3	4	5	6
Running	0	1	2	3	4	5	6
Stairmaster	0	1	2	3	4	5	6
Swimming	0	1	2	3	4	5	6
Walking	0	1	2	3	4	5	6
X-country Skiing	0	1	2	3	4	5	6
Other_____	0	1	2	3	4	5	6

Did you participate in high school sports? YES_____ **NO**_____
If YES, which sports? (check all that apply)

Baseball ___	Wrestling ___
Basketball ___	Track & Field ___
Football ___	Tennis ___
Golf ___	Cheerleading ___
Softball ___	Volleyball ___
Soccer ___	Swimming ___
Xcountry ___	Other _____

I attend aerobics (check one):

By myself ___
With a friend ___
With a group of friends ___

Have you ever particpated in intramural sports? YES___ **NO**___
If YES, which sports?_____

Have you ever participated in community recreation or park district sport or exercise programs? YES___ **NO**___
If YES, which sports? _____

How often do you plan to attend aerobics class per week? (circle one)

Once a week 2x/week 3x/week 4x/week 5x/week

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I enjoy exercise	1	2	3	4	5
I enjoy aerobic exercise classes	1	2	3	4	5
I look forward to exercise	1	2	3	4	5
I enjoy other forms of exercise	1	2	3	4	5

The next two questions have words that mean the opposite at each end. For example you may not believe exercise is all good or all bad, but are rather more neutral about it. If so, you would circle 4. Circle the number along the 1-7 continuum that best represents what you believe is true for you.

For me to participate in a regular exercise class on a regular basis is:

1	2	3	4	5	6	7
Good						Bad
1	2	3	4	5	6	7
Beneficial						Harmful
1	2	3	4	5	6	7
Attractive						Unattractive
1	2	3	4	5	6	7
Rewarding						Punishing
1	2	3	4	5	6	7
Desirable						Undesirable
1	2	3	4	5	6	7
Fun						A real chore

For me to TRY to participate in a regular exercise class on a regular basis is:

1	2	3	4	5	6	7
Good						Bad
1	2	3	4	5	6	7
Beneficial						Harmful
1	2	3	4	5	6	7
Attractive						Unattractive
1	2	3	4	5	6	7
Rewarding						Punishing
1	2	3	4	5	6	7
Desirable						Undesirable
1	2	3	4	5	6	7
Fun						A real chore

INSTRUCTIONS: READ each reason for exercising and then determine how much you agree with each reason in terms of WHY YOU EXERCISE (or why you have or would engage in exercise if you are not physically active now). CIRCLE the number on the five point scale to show how much you DISAGREE or AGREE with each reason.

	Strongly Disagree 1	Disagree 2	Uncertain 3	Agree 4	Strongly Agree 5
1. Winning at physical activities is important to me.	1	2	3	4	5
2. I exercise to look better.	1	2	3	4	5
3. I exercise to control my anxiety.	1	2	3	4	5
4. I find exercise is more fun when there are others to do it with.	1	2	3	4	5
5. I like people to be aware that I am physically active.	1	2	3	4	5
6. Exercise helps me to prevent health problems.	1	2	3	4	5
7. Exercise helps me to remain limber.	1	2	3	4	5
8. I engage in physical activity to contro my weight.	1	2	3	4	5
9. When exercising, I feel successful when I perform to the best of my ability.	1	2	3	4	5
10. Through exercise, I can be physically strong.	1	2	3	4	5
11. I find competitive physical activities fun.	1	2	3	4	5
12. I participate in physical activity to improve my appearance.	1	2	3	4	5
13. I exercise to help me cope with stress.	1	2	3	4	5
14. I try to exercise with others when I can.	1	2	3	4	5
15. Feedback from others about how well I am doing is important to me.	1	2	3	4	5
16. Physical activity helps me to prevent the onset of disease.	1	2	3	4	5
17. I exercise to increase my agility.	1	2	3	4	5
18. Physical activity helps me to lose weight.	1	2	3	4	5
19. Doing my personal best in an activity is important to me.	1	2	3	4	5
20. When exercising, I like to do as well as I can.	1	2	3	4	5
21. I exercise to become stronger.	1	2	3	4	5
22. I exercise to improve my endurance.	1	2	3	4	5
23. I find exercise fun especially when competition is involved.	1	2	3	4	5
24. I exercise because I want a nice body.	1	2	3	4	5
25. After exercising, I tend to feel more calm.	1	2	3	4	5
26. I enjoy exercise because it allows me to interact with other people.	1	2	3	4	5
27. I exercise because I prefer others knowing that I am physically active.	1	2	3	4	5
28. I exercise to avoid illness.	1	2	3	4	5

29. I engage in physcial activity to become more flexible.	1	2	3	4	5
30. Exercise helps me to manage my weight.	1	2	3	4	5
31. Physical activity is most fun when I have done the best that I can do.	1	2	3	4	5
32. I participate in physical activity to increase my strength.	1	2	3	4	5
33. I exercise so that I am not easily winded during strenuous activities.	1	2	3	4	5
34. I enjoy competing in exercise activities.	1	2	3	4	5
35. I engage in physical activity so that I can be more attractive.	1	2	3	4	5
36. I enjoy exercise because of the sense of solitude.	1	2	3	4	5
37. One of the best things about exercise is that I can do it with other people.	1	2	3	4	5
38. I exercise to gain the attention of other people.	1	2	3	4	5
39. I participate in physical activity to be agile.	1	2	3	4	5
40. I exercise to burn calories.	1	2	3	4	5
41. Exercise helps me to keep my muscles strong.	1	2	3	4	5
42. I exercise to improve my body tone.	1	2	3	4	5
43. I participate in physical activity because it gives me space to be alone.	1	2	3	4	5
44. Exercise helps me to maintain or enhance my flexibility.	1	2	3	4	5
45. Exercise helps me to keep my heart strong.	1	2	3	4	5
46. I exercise because it provides me with an opportunity to be alone with my thoughts.	1	2	3	4	5
47. Physical activity helps me to be nimble and quick.	1	2	3	4	5
48. Exercise provides me with an opportunity to think through the events of the day.	1	2	3	4	5

INSTRUCTIONS: Given the situations below, indicate by circling the appropriate percentage, your level of confidence in your ability to still attend you exercise class.

1. How confident are you that you would still attend class if the person or persons you normally exercise with discontinued their exercise program?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not Confident					Somewhat Confident					Extremely Confident

2. How confident are you that you would still attend class if you found yourself progressing at a much slower rate than the others in your exercise group?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not Confident					Somewhat Confident					Extremely Confident

3. How confident are you that you would still attend class if you felt tired?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not Confident					Somewhat Confident					Extremely Confident

4. How confident are you that you would still attend class if you had a commitment come up during the same time the exercise class met?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not Confident					Somewhat Confident					Extremely Confident

5. How confident are you that you would still attend class if the exercise class failed to show results within the first few weeks?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not Confident					Somewhat Confident					Extremely Confident

6. How confident are you that you would still attend class if you had an exam the next morning?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not Confident					Somewhat Confident					Extremely Confident

7. How confident are you that you would still attend class if you felt discomfort?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not Confident					Somewhat Confident					Extremely Confident

INSTRUCTIONS: Please indicate your amount of confidence, by circling the appropriate percentage, that you would be able to engage in continued vigorous aerobic exercise at your target heart rate, 3 times per week, for each of the following amount of minutes.

8. For 20 minutes per session?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not Confident					Somewhat Confident					Extremely Confident

9. For 30 minutes per session?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not Confident					Somewhat Confident					Extremely Confident

10. For 40 minutes per session?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not Confident					Somewhat Confident					Extremely Confident

INSTRUCTIONS: In answering this set of questions, think about your current relationships with family members, friends, co-workers, others in this exercise class, community members, and so on. To what extent do you agree that each statement describes your current relationships with any of these people? Please circle the number that best indicates how strongly you agree or disagree with each statement. If you feel a statement is very true of current relationships with any of these people, you would respond "strongly agree" and circle the number 4. If you feel a statement clearly does not describe your relationships, you would respond "strongly disagree" and circle number 1.

1. There are people I can depend on to help me if I really need it.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

2. I feel that I do not have close personal relationships with other people.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

3. There is no one I can turn to for guidance in times of stress.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

4. There are people who depend on me for help.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

5. There are people who enjoy the same social activities as I do.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

6. Other people do not view me as competent.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

7. I feel personally responsible for the well-being of another person.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

8. I feel part of a group of people who share my attitudes and beliefs

1	2	3	4
strongly disagree	disagree	agree	strongly agree

9. I do not think other people respect my skills and abilities.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

10. If something went wrong, no one would come to my assistance.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

11. I have close relationships that provide me with a sense of emotional security and well-being.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

12. There is someone I could talk to about important decisions in my life.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

13. I have relationships where my competence and skills are recognized.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

14. There is no one who shares my interests and concerns.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

15. There is no one who really relies on me for their well-being.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

16. There is a trustworthy person I could turn to for advice if I were having problems.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

17. I feel a strong emotional bond with at least one other person.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

18. There is no one I could depend on for aid if I really need it.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

19. There is no one I feel comfortable talking about problems with.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

20. There are people who admire my talents and abilities.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

21. I lack a feeling of intimacy with another person.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

22. There is no one who likes to do the things I do.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

23. There are people I can count on in an emergency.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

24. No one needs me to care for them.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

Appendix C

THANK YOU FOR PARTICIPATING IN THIS STUDY!! YOUR ASSISTANCE AND COOPERATION WILL HELP RESEARCHERS IN EXERCISE SCIENCE BETTER UNDERSTAND THE EXERCISE BEHAVIORS OF INDIVIDUALS SUCH AS YOURSELVES.

Please read each set of instructions before you answer a set of questions. I hope you will find this an interesting survey to complete. Thank you again for your participation during this semester!

Name _____ **Phone No.** _____
School Address _____

How often did you participate in the following physical activities during the Fall Semester?

	Never	Rarely (less than 1x/mo.)	Sometimes (1-2x/mo.)	Frequently (3-4times/ mo.)	Often (1-3x/ wk.)	Very Often (4-6x/ wk.)	Daily
Aerobics	0	1	2	3	4	5	6
Bicycling	0	1	2	3	4	5	6
Rollerblading	0	1	2	3	4	5	6
Running	0	1	2	3	4	5	6
Stairmaster	0	1	2	3	4	5	6
Swimming	0	1	2	3	4	5	6
Walking	0	1	2	3	4	5	6
X-country Skiing	0	1	2	3	4	5	6
Other_____	0	1	2	3	4	5	6

I attend aerobics (check one):
By myself ___
With a friend ___
With a group of friends ___

How often did you attend aerobics this past semester (circle one)?

Once a week 2x/week 3x/week 4x/week 5x/week

Did you atend (check one):
More often than planned ___
Less often than planned ___
As often as you planned ___

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I enjoy exercise	1	2	3	4	5
I enjoy aerobic exercise classes	1	2	3	4	5
I look forward to exercise	1	2	3	4	5
I enjoy other forms of exercise	1	2	3	4	5

The next two questions have words that mean the opposite at each end. For example you may not believe exercise is all good or all bad, but are rather more neutral about it. If so, you would circle 4. Circle the number along the 1-7 continuum that best represents what you believe is true for you.

For me to participate in a regular exercise class on a regular basis is:

1	2	3	4	5	6	7
Good						Bad
1	2	3	4	5	6	7
Beneficial						Harmful
1	2	3	4	5	6	7
Attractive						Unattractive
1	2	3	4	5	6	7
Rewarding						Punishing
1	2	3	4	5	6	7
Desirable						Undesirable
1	2	3	4	5	6	7
Fun						A real chore

For me to TRY to participate in a regular exercise class on a regular basis is:

1	2	3	4	5	6	7
Good						Bad
1	2	3	4	5	6	7
Beneficial						Harmful
1	2	3	4	5	6	7
Attractive						Unattractive
1	2	3	4	5	6	7
Rewarding						Punishing
1	2	3	4	5	6	7
Desirable						Undesirable
1	2	3	4	5	6	7
Fun						A real chore

INSTRUCTIONS: READ each reason for exercising and then determine how much you agree with each reason in terms of WHY YOU EXERCISE (or why you have or would engage in exercise if you are not physically active now). CIRCLE the number on the five point scale to show how much you DISAGREE or AGREE with each reason.

	Strongly Disagree 1	Disagree 2	Uncertain 3	Agree 4	Strongly Agree 5
1. Winning at physical activities is important to me.	1	2	3	4	5
2. I exercise to look better.	1	2	3	4	5
3. I exercise to control my anxiety.	1	2	3	4	5
4. I find exercise is more fun when there are others to do it with.	1	2	3	4	5
5. I like people to be aware that I am physically active.	1	2	3	4	5
6. Exercise helps me to prevent health problems.	1	2	3	4	5
7. Exercise helps me to remain limber.	1	2	3	4	5
8. I engage in physical activity to contro my weight.	1	2	3	4	5
9. When exercising, I feel successful when I perform to the best of my ability.	1	2	3	4	5
10. Through exercise, I can be physically strong.	1	2	3	4	5
11. I find competitive physical activities fun.	1	2	3	4	5
12. I participate in physical activity to improve my appearance.	1	2	3	4	5
13. I exercise to help me cope with stress.	1	2	3	4	5
14. I try to exercise with others when I can.	1	2	3	4	5
15. Feedback from others about how well I am doing is important to me.	1	2	3	4	5
16. Physical activity helps me to prevent the onset of disease.	1	2	3	4	5
17. I exercise to increase my agility.	1	2	3	4	5
18. Physical activity helps me to lose weight.	1	2	3	4	5
19. Doing my personal best in an activity is important to me.	1	2	3	4	5
20. When exercising, I like to do as well as I can.	1	2	3	4	5
21. I exercise to become stronger.	1	2	3	4	5
22. I exercise to improve my endurance.	1	2	3	4	5
23. I find exercise fun especially when competition is involved.	1	2	3	4	5
24. I exercise because I want a nice body.	1	2	3	4	5
25. After exercising, I tend to feel more calm.	1	2	3	4	5
26. I enjoy exercise because it allows me to interact with other people.	1	2	3	4	5
27. I exercise because I prefer others knowing that I am physically active.	1	2	3	4	5
28. I exercise to avoid illness.	1	2	3	4	5

29. I engage in physcial activity to become more flexible.	1	2	3	4	5
30. Exercise helps me to manage my weight.	1	2	3	4	5
31. Physical activity is most fun when I have done the best that I can do.	1	2	3	4	5
32. I participate in physical activity to increase my strength.	1	2	3	4	5
33. I exercise so that I am not easily winded during strenuous activities.	1	2	3	4	5
34. I enjoy competing in exercise activities.	1	2	3	4	5
35. I engage in physical activity so that I can be more attractive.	1	2	3	4	5
36. I enjoy exercise because of the sense of solitude.	1	2	3	4	5
37. One of the best things about exercise is that I can do it with other people.	1	2	3	4	5
38. I exercise to gain the attention of other people.	1	2	3	4	5
39. I participate in physical activity to be agile.	1	2	3	4	5
40. I exercise to burn calories.	1	2	3	4	5
41. Exercise helps me to keep my muscles strong.	1	2	3	4	5
42. I exercise to improve my body tone.	1	2	3	4	5
43. I participate in physical activity because it gives me space to be alone.	1	2	3	4	5
44. Exercise helps me to maintain or enhance my flexibility.	1	2	3	4	5
45. Exercise helps me to keep my heart strong.	1	2	3	4	5
46. I exercise because it provides me with an opportunity to be alone with my thoughts.	1	2	3	4	5
47. Physical activity helps me to be nimble and quick.	1	2	3	4	5
48. Exercise provides me with an opportunity to think through the events of the day.	1	2	3	4	5

INSTRUCTIONS: Given the situations below, indicate by circling the appropriate percentage, your level of confidence in your ability to still attend you exercise class.

1. How confident are you that you would still attend class if the person or persons you normally exercise with discontinued their exercise program?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not Confident					Somewhat Confident					Extremely Confident

2. How confident are you that you would still attend class if you found yourself progressing at a much slower rate than the others in your exercise group?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not Confident					Somewhat Confident					Extremely Confident

3. How confident are you that you would still attend class if you felt tired?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not Confident					Somewhat Confident					Extremely Confident

4. How confident are you that you would still attend class if you had a commitment come up during the same time the exercise class met?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not Confident					Somewhat Confident					Extremely Confident

5. How confident are you that you would still attend class if the exercise class failed to show results within the first few weeks?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not Confident					Somewhat Confident					Extremely Confident

6. How confident are you that you would still attend class if you had an exam the next morning?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not Confident					Somewhat Confident					Extremely Confident

7. How confident are you that you would still attend class if you felt discomfort?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not Confident					Somewhat Confident					Extremely Confident

INSTRUCTIONS: Please indicate your amount of confidence, by circling the appropriate percentage, that you would be able to engage in continued vigorous aerobic exercise at your target heart rate, 3 times per week, for each of the following amount of minutes.

8. For 20 minutes per session?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not Confident					Somewhat Confident					Extremely Confident

9. For 30 minutes per session?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not Confident					Somewhat Confident					Extremely Confident

10. For 40 minutes per session?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not Confident					Somewhat Confident					Extremely Confident

INSTRUCTIONS: In answering this set of questions, think about your current relationships with family members, friends, co-workers, others in this exercise class, community members, and so on. To what extent do you agree that each statement describes your current relationships with any of these people? Please circle the number that best indicates how strongly you agree or disagree with each statement. If you feel a statement is very true of current relationships with any of these people, you would respond "strongly agree" and circle the number 4. If you feel a statement clearly does not describe your relationships, you would respond "strongly disagree" and circle number 1.

1. There are people I can depend on to help me if I really need it.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

2. I feel that I do not have close personal relationships with other people.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

3. There is no one I can turn to for guidance in times of stress.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

4. There are people who depend on me for help.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

5. There are people who enjoy the same social activities as I do.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

6. Other people do not view me as competent.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

7. I feel personally responsible for the well-being of another person.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

8. I feel part of a group of people who share my attitudes and beliefs.

1	2	3	4
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9. I do not think other people respect my skills and abilities.

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strongly disagree	disagree	agree	strongly agree

10. If something went wrong, no one would come to my assistance.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

11. I have close relationships that provide me with a sense of emotional security and well-being.

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strongly disagree	disagree	agree	strongly agree

12. There is someone I could talk to about important decisions in my life.

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strongly disagree	disagree	agree	strongly agree

14. There is no one who shares my interests and concerns.

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strongly disagree	disagree	agree	strongly agree

15. There is no one who really relies on me for their well-being.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

16. There is a trustworthy person I could turn to for advice if I were having problems.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

17. I feel a strong emotional bond with at least one other person.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

18. There is no one I could depend on for aid if I really need it.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

19. There is no one I feel comfortable talking about problems with.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

20. There are people who admire my talents and abilities.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

21. I lack a feeling of intimacy with another person.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

22. There is no one who likes to do the things I do.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

23. There are people I can count on in an emergency.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

24. No one need me to care for them.

1	2	3	4
strongly disagree	disagree	agree	strongly agree

Indiate the amount and type (negative to positive) of support you received from each of the following:

Example of positive support: "Have you been working out? You look like you've lost weight."

Example of negative support: The person you usually attend aerobics with decides no to go, your significant other wonders when you're going to start working when you already have been. In other words, there is no visible difference yet.

	Very Negative	Negative	Positive	Very Positive	No Support Received
Parents	1	2	3	4	0
Significant Other	1	2	3	4	0
Physician	1	2	3	4	0
Exercise Partner	1	2	3	4	0
Friends	1	2	3	4	0
Work Colleagues	1	2	3	4	0
Boss/Supervisor	1	2	3	4	0

When you did not attend aerobics, what was usually the main reason?

Circle the number on the 5-point scale to show how much you agree or disagree with each statement.

	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
Having the weekly meetings:					
Was beneficial	1	2	3	4	5
Not helpful	1	2	3	4	5
Enjoyable	1	2	3	4	5
A nuisance	1	2	3	4	5
Made attending more difficult	1	2	3	4	5
Was a good way to discuss my exercise experience	1	2	3	4	5
Helped me through the times it was hard for me to attend	1	2	3	4	5

Was a way for me to meet new friends	1	2	3	4	5
Made me more accountable for my aerobic attendance	1	2	3	4	5
Having to keep track of my aerobic attendance helped me attend more often	1	2	3	4	5

What changes could have been made to make the weekly meetings more helpful in aerobic attendance?_____

_____

What (if anything) was most helpful to you in the meetings?_____

_____

Did having a weekly meeting make a difference in your aerobic attendance (check one)?

Attended more____ Attended less____ Didn't affect my attendance____

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