COPING STRATEGIES FOR WORKING WOMEN: AEROBIC EXERCISE AND
RELAXATION INTERVENTIONS

by

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ABSTRACT

This study examined the effects of two 8-week stress-management interventions (aerobic exercise and progressive relaxation) on reductions in trait anxiety, increases in self-efficacy, and enhancement of coping strategies for sedentary working women. It was expected that aerobic exercise, a relatively new treatment, would be as effective or more effective than progressive relaxation, a well researched treatment, as a stress-management intervention.

The subjects were 72 females aged 24-59, ($M = 39.8$) solicited from the Vancouver community via newspaper advertisement asking for stressed volunteers to participate in two stress-management programs. They were interviewed and randomly assigned to an aerobic exercise or progressive relaxation treatment. The treatment sessions were conducted over an 8-week period with subjects meeting in groups for 1 1/2 hours per week. Prior to the first session subjects were administered: STAI-T (Spielberger, Gorsuch, & Lushene, 1970), the General Self-Efficacy Scale (Sherer et al., 1982), Ways of Coping Checklist (Lazarus & Folkman, 1984), and a 7-Day Exercise Recall Inventory (Blair, 1984). Subjects were assessed again at posttreatment and at 8-week follow-up.

Repeated measures, multivariate analysis of variance with preplanned contrasts, indicated that both treatment groups were effective in decreasing trait anxiety and increasing self-efficacy from pre- to posttreatment. These changes were maintained at 8-week follow-up. In addition, a one-way multivariate analysis of variance with repeated measures indicated that the total number of coping strategies, as well as the difference between the number of problem-focused and emotion-focused coping strategies, did not change significantly from pre- to posttreatment. Additionally, there was a negative relationship between low scores in self-efficacy and high scores in emotion-focused coping.

In response to ancillary posttreatment and follow-up questionnaires, aerobic exercise was perceived by the participants as a more satisfactory stress-management treatment. Implications of these results and suggestions for future studies are discussed.

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Introduction

Women's participation in the workforce has more than doubled in the past 30 years, yet few studies have concentrated on how women cope with work-related stress. There has also been limited focus on how women cope with stress as a result of stress-management interventions despite the proliferation of such interventions (Woolfolk & Lehrer, 1984). Unfortunately, coping strategies (i.e., techniques individuals use to solve problems or reduce emotional responses, Lazarus & Folkman, 1984) have seldom been studied as an intervention "outcome" (Meichenbaum & Jaremko, 1983). Therefore, the primary purpose of this study was to compare the effectiveness of stress-management interventions for working women, and to examine changes in coping strategies as an outcome.

Traditionally, investigators conceptualized coping as a trait rather than as a process (i.e., studies focused upon the individual's general disposition, rather than the strategy employed). Examples of studies which include coping traits are Friedman and Rosenman's (1974) Type A behavior and Bryne's (1964) repression-sensitization. Trait measures are seldom found to correlate with coping strategies (Fleming, Baum, & Singer, 1984). In most cases, trait measures are evaluated along a single dimension, but many situations call for a wide range of coping strategies

(Moos & Billings, 1982). For example, an ill person must deal with several sources of stress--pain, the hospital situation, and visitors. Because of the multiple situations involved, it is doubtful whether all of the ways an individual copes can be accounted for by a single dimensional measure. Thus, researchers are beginning to examine the diverse range of coping strategies (Astor-Dubin & Hammen, 1984; Folkman & Lazarus, 1985; Parkes, 1984).

Folkman and Lazarus (1980) have developed a model which considers two basic dimensions of coping: problem-focused coping and emotion-focused coping. These two strategies can function separately or in conjunction with one another (Lazarus & Folkman, 1984). Emotion-focused coping is likely to occur when the situation has been appraised such that nothing can be done to change it, whereas problem-focused coping is more likely to be used when situations are appraised as possible to change. Evidence is accruing that the use of problem-focused strategies are related to more effective coping (Billings & Moos, 1981; Finn, 1985; Pearlin & Schooler, 1978). Although some researchers identify other coping dimensions (e.g., appraisal-focused coping), most forms of coping scales incorporate problem-focused and emotion-focused coping as basic components. In a study of 100 middle-aged subjects, Folkman and Lazarus (1980) found that both

problem-focused and emotion-focused coping were used by all subjects. Results from these studies suggest that both emotion-focused and problem-focused coping should be evaluated when measuring an individual's coping strategies.

While some researchers have found evidence for gender differences in coping (Astor-Dubin & Hammen, 1984; Billings & Moos, 1981; Folkman & Lazarus, 1980; Pearlin & Schooler, 1978), few studies have specifically examined coping responses in women. Folkman and Lazarus (1980) found that men used more problem-focused coping than women in situations that were unchangeable but that women used both types of coping strategies more often. Vitaliano, Russo, Carr, Maiuro, and Becker (1985) examined three diverse samples (psychiatric patients, spouses of patients with Alzheimer's disease, and medical students) and also found that females had significantly higher scores than males for total number of coping strategies. Pearlin and Schooler (1978) found that men and more educated individuals used a more effective mode of coping. Effective coping was defined as a varied repertoire of coping strategies. This study focused on enduring rather than recent specific stressful encounters. In a related study on depression, Astor-Dubin and Hammen (1984) found that women make more coping responses, engage in more active and behavioral coping, and seek

others out, while men use more cognitive coping. However, in their study the nature of the stressor was not controlled. Since the above studies have examined coping behaviors in specific contexts, it cannot be assumed that coping behaviors will generalize to other situations.

In summary, research on coping has been hampered by treating variables as if they were unidirectional, defining coping as a trait, focusing on single stressful events, using inadequate measurements and methodology, and failing to consider gender differences. However, current studies are beginning to focus on strategies of coping utilized over time and there is continuing development of test instruments (e.g., Ways of Coping Checklist, Folkman & Lazarus, 1980) as well as revisions of the coping dimensions (Billings & Moos, 1981; Vitaliano et al., 1985).

Traditional treatments for coping with stress have involved behavioral techniques, such as systematic desensitization and relaxation, and more recently, cognitive techniques, such as stress inoculation and thought stopping (Woolfolk & Lehrer, 1984). A promising intervention, physical activity, has also been used as a stress-management treatment (e.g., Long, 1984). Evidence is accumulating that physical activity, particularly aerobic exercise may play an important role in stress reduction (for reviews see

Eide, 1982; Folkins & Sime, 1981; Ledwidge, 1980; Mihevic, 1982). The terms exercise, aerobic exercise, and physical activity are used interchangeably in this paper and refer to gross muscle activities. For aerobic benefits to occur individuals should exercise at a minimum intensity of 60% of maximum heart rate, for a duration of 15 to 60 minutes at a frequency of 3 to 5 days per week (American College of Sports Medicine, 1980). Participation in an aerobic exercise program has been shown to be related to reductions in anxiety in both clinical and non-clinical populations. However, most studies limited their samples to sedentary individuals (Doyme, Chambless, & Beutler, 1983; Folkins, Lynch, & Gardner, 1972; Hilyer & Mitchell, 1979; Young & Ismail, 1976).

From studies reviewed, it appears that processes such as better psychological functioning, improved self-efficacy (i.e., the belief that one can successfully perform a coping behavior), and reduced anxiety are important outcomes that may account for exercise as an effective stress-management intervention (Jasnoski & Holmes, 1981; Long, 1984). For example, in a controlled study Long (1984) found that subjects reduced anxiety and increased self-efficacy as the result of a 10-week aerobic exercise intervention. These changes were maintained at a 15-month follow-up.

A study by Jasnoski and Holmes (1981) assessed 103 women after they participated in a 15-week aerobic training program. It was found that better personality functioning (more emotional stability, more self-assurance and less reported tenseness) was reliably associated with higher levels of aerobic fitness, and with participation in the program independent of changes in fitness. Furthermore, Jasnoski, Holmes, Solomon, and Aguiar (1981) assessed whether physical fitness or merely participation in an endurance program mediates psychological change. These researchers compared women in a 10-week exercise class with waitlist controls and an independent control group. They found that participation per se (a) improved scores on self-perceived abilities in relation to jogging, and (b) improved general self-confidence, compared to control groups. Thus, there appears to be some support for exercise participation per se as a viable stress-management intervention for sedentary individuals.

While evidence accumulates to support the benefits of exercise for mental health, maintenance of exercise behavior has been problematic (Martin & Dubbert, 1985). A growing body of research suggests that the majority of people who begin an exercise program will stop, often within the first few months (Dishman, 1982; Martin & Dubbert, 1982; Ward & Morgan, 1984). One of

the psychological characteristics found to correlate positively with the probability of adherence to an enactive program (i.e., walking, smoking treatment) is self-efficacy (Condiotte & Lichtenstein, 1981; Kaplan, Atkins, & Reinsch, 1984). According to self-efficacy theory, expectations of self-efficacy determine what activities people engage in, how much effort they will expend and how long they will persist in the face of adversity (Bandura, 1977). Evidence supporting self-efficacy as a predictor of behavior change comes from areas such as health behavior, for example smoking cessation (Condiotte & Lichtenstein, 1981), and obesity treatments (Mitchell & Stuart, 1984).

Kazdin and Wilson (1978) propose that the comparison of two treatment packages is considered viable for outcome research when the primary commitment is to discover a treatment to accommodate a clinical problem, when the treatments are similar, and when one treatment is known to be effective. Since Progressive Relaxation programs (Woolfolk & Lehrer, 1984) have been shown to be effective in reducing trait and state anxiety, changing mood, and increasing the ability to relax for a wide variety of populations (Cangelosi, 1980; Heidi & Borkovec, 1983; Wood, 1978; Woolfolk, Lehrer, McCann, & Rooney, 1982), in this study progressive relaxation was used as a standard with which to compare an aerobic exercise program as a

stress-management intervention. An aerobic walk/jog program was used because it was time and cost efficient, easy to administer, and other studies have used similar programs (Jasnoski et al., 1981; Long, 1984).

The main objective of this study was to examine the effects of two 8-week stress-management interventions (progressive relaxation and aerobic exercise) for sedentary working women. It was hypothesized that an 8-week exercise intervention would be equally or more effective than progressive relaxation in significantly reducing trait anxiety, and increasing self-efficacy. In addition, it was hypothesized that both treatment groups would increase their coping strategies and, more specifically, problem-focused strategies would increase and emotion-focused strategies would remain the same after the interventions. Furthermore, it was hypothesized that participants with greater levels of self-efficacy after the exercise interventions, would show a greater frequency of jogging at follow-up than participants lower in self-efficacy.

Review of Literature

Coping with chronic stressful events is for the most part poorly understood and may be due to traditional trait-oriented formulations of coping (Folkman & Lazarus, 1980). Therefore, Folkman and Lazarus' (1980) process-oriented transactional model of coping is used to examine coping processes. Through a review of research in the area of coping, the issues of measurement and gender differences are discussed. In addition, support for stress-management interventions such as aerobic exercise and progressive relaxation is provided. Furthermore, self-efficacy expectations which are considered to affect both the initiation and persistence of coping behavior (Bandura, 1977) are reviewed in relation to stress-management programs.

Theories/Models of Coping

Although coping plays a central role in current theories of stress, research is just beginning to explore the specific coping processes people use in adapting to stressful life circumstances. A traditional theoretical perspective, psychoanalytic ego theory (Valliant, 1977), has contributed to current conceptualizations and measures of coping. In psychoanalytic theory coping is defined as realistic and flexible thoughts and acts intended to solve problems and therefore reduce stress. This theory differentiates among a number of processes that people

use to handle person-environment relationships. These ego processes are cognitive mechanisms whose functions are defensive (reality distorting) and emotion focused (oriented toward tension reduction).

Lazarus and Folkman (1984) developed a transactional model of coping as an alternative to psychoanalytic formulations of coping. The transactional model is process-oriented in that the person and the environment are viewed as being in a dynamic, mutually reciprocal, bidirectional relationship. Coping is defined as changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as exceeding the resources of the individual. The person-environment relationship, in the context of coping, is process-oriented and therefore concerned with what the person actually thinks and does in a specific context, and with changes in thoughts and actions as an encounter unfolds.

Functions of Coping

According to Lazarus and Folkman (1984) coping serves two overriding functions: (a) managing or altering the problem causing stress--problem-focused coping (P-focused), and (b) regulating the emotional response to the problem--emotion-focused coping (E-focused). These two major functions of coping have also been identified by Moos and Billings (1982),

Felton and Revenson (1984), and Pearlin and Schooler (1978) in their research.

E-focused coping includes strategies such as avoidance, selective attention, and wishful thinking. It is used when the situation has been appraised such that nothing can be done to change it (Lazarus & Folkman, 1984). In addition, E-focused coping helps an individual maintain hope and optimism and to refuse to acknowledge the worst. As a result, E-focused processes may lend themselves to an interpretation of self-deception (Lazarus, 1985). Self-deception is best described as being on a continuum rather than dichotomized as pathogenic or healthy. For example, self-deception can lead to serious consequences if a person ignores an illness such as diabetes which requires attention to diet and exercise. Alternately, self-deception can have a positive value at an early stage of coping when a person's resources are insufficient to cope in a more P-focused way (i.e., a spinal cord patient is helped for a while by believing the incapacitation is not as severe as it seems). Lazarus (1985) suggests that only later will the person come to terms with the reality of the situation and struggle to cope in a more P-focused manner.

P-focused strategies include generating solutions to the problem, weighing the alternatives, and acting on the problem. P-focused coping is typically used

when situations are appraised as possible to change, and empirical research suggests that P-focused strategies are related to more effective coping (Billings & Moos, 1981; Felton & Revenson, 1984; Finn, 1985; Pearlin & Schooler, 1978). The following studies, although not without methodological problems provide some support for the effectiveness of P-focused coping. For example, individuals self-report that they are less stressed when they rely more on P-focused than E-focused coping (Finn, 1985; Holahan & Moos, 1985). Stress in these studies has been measured by a revised form of Stressful Life Events Scale (Dohrenwend & Dohrenwend, 1974), and psychosomatic symptoms and depression questions adapted from work by Langner (1962). However, it should not be assumed that P-focused coping is always more effective than E-focused coping. As mentioned earlier, both forms of coping are used in most stressful situations and they tend to facilitate each other in almost every coping episode (Folkman, Lazarus, Gruen, & DeLongis, 1986).

Billings and Moos (1981) found in a survey study of 194 families that fewer avoidance behaviors (E-focused) and more reliance on active attempts (P-focused) to deal with a stressful event were associated with less stress. Respondents indicated a recent stressful event, then responded to 19 items asking how they dealt with the event. Interestingly,

illness events elicited more P-focused coping than did most other categories (i.e., work, home, and children). This is contrary to findings by Folkman and Lazarus (1980) in an empirical study of 100 community residents aged 45 to 65. These researchers found that health contexts favored E-focused coping while work contexts favored P-focused coping. Participants in this study were interviewed seven times at 4-week intervals about stressful events that had occurred during the previous month. A 68-item Ways of Coping Checklist (WCC) was used to indicate which types of coping they used in the stressful situation. As mentioned above, work was associated with higher levels of P-focused coping. In addition, family-related stresses elicited a mix of P-focused and E-focused coping and while E-focused coping was most frequent in health-related episodes, P-focused coping was also used in these episodes. One weakness in both of the studies appears to be the use of a binary response format which fails to show the intensity of a strategy and forces the individual to answer yes/no. Also, Billings and Moos' study was self-report, correlational data collected at a single point in time while Folkman and Lazarus' study focused on specific stressful episodes (1,332) on seven different occasions. Therefore, while both studies identified the types of responses made to various stressful events only Folkman and Lazarus' study

measured the frequency of responses over time.

Pearlin and Schooler (1978) interviewed 2,300 people between the ages of 18 and 65. Data for their study were collected through an interview which asked participants to: (a) identify potential life strains (conflicts, threats), (b) identify how they dealt with the strains, and (c) express the extent to which they experienced anxiety. Participants identified strains from the areas of marriage, parenting, home and occupation. A typical role-related question was, "With regard to your job how (bothered, worried, tense) do you feel?" The researchers found that manipulation of goals was more effective for work-related stresses while having a varied repertoire was favorable for coping with marital and parental stressors. More, specifically, they found self-reliance and controlled reflectiveness more effective in coping with marital strains while making positive comparisons was most helpful in coping with parental strains. In addition, in the work area manipulation of goals (identified as P-focused coping by Billings & Moos, 1981) seemed to be the most effective way of coping.

One possible problem with the above study was the general nature of the questions which tended to focus on the day-to-day feelings of the individuals regarding their role rather than a specific stressful event. Also, subjects were asked how they usually coped with

general sources of stress not how they actually coped in specific situations. In addition, women and men were compared on occupational coping, yet, all of the women in the study were from a lower socio-economic status than the men. Therefore, it is difficult to generalize from this study to other populations because studies are finding that individuals not only cope differently across situations (Folkman & Lazarus, 1980) but also that individuals from lower socio-economic status may have limited coping repertoires due to their situation (Billings & Moos, 1981).

Findings by Felton and Revenson (1984) provide additional support for the effectiveness of P-focused strategies. In a study of 151 middle-aged and older adults suffering from chronic illness, information seeking was found to have salubrious effects on adjustment while wish-fulfilling fantasies were linked to poorer adjustment. Using the WCC (Folkman & Lazarus, 1980) subjects were asked how frequently they had used each of the behaviors listed in relation to their chronic illness. However, rather than focusing on how the individual coped with a specific stressful encounter, subjects were asked how they "generally" coped. Asking this question may tend to solicit information about an individual's personality disposition rather than finding out what actually happened since there is a poor correlation with what

people say they do and what they actually do (Folkman & Lazarus, 1980).

In an exploratory study of battered women ($n = 56$), Finn (1985) found that abused subjects, compared to the general female population, used passive coping as opposed to problem-solving coping strategies when dealing with stressful situations. Thus, the coping strategies used by battered women were least likely to alter their circumstances or resolve their stresses. Subjects completed a 29-item F-Copes scale developed by McCubbin, Larsen, and Olson (1982) to record how they dealt with 10 commonly cited spouse-abuse stressors. Generalizability of this study is limited to lower-class battered women who utilized a spouse-abuse shelter. In addition, the study focused on a limited range of events to assess coping strategies. Perhaps battered women only use E-focused coping in home situations.

Patterson and McCubbin (1984) reported that wives ($n = 82$) faced with the stressor of long term (military) separation from their husbands coped better when they used a balanced coping strategy which reflected a high usage of both P- and E-focused coping. In addition, the non-stressed women scored significantly higher than the stressed women on acceptance of lifestyle and optimism. This study suggests that effective copers use a wide range of

P-focused and E-focused coping strategies.

The former broadly focused studies have explored how an individual copes in major life roles (i.e., work, marriage, parenting and finance). The following study focuses on a specific stressful encounter (midterm exam) and describes how an individual copes throughout the encounter.

Folkman and Lazarus (1985) studied 108 students during three stages of a midterm exam: (a) the anticipation stage before the exam, (b) the waiting stage after the exam before the grades were posted, and (c) after grades were posted. A 57-item form of WCC (Folkman & Lazarus, 1980) was used to record how subjects reacted in each of the above stressful stages. The researchers found that 97% of the subjects used both P-focused and E-focused forms of coping at each stage. However, P-focused coping was used most often at the anticipatory stage, while E-focused coping (distancing) was used most often at the waiting stage and a combination of P- and E-focused coping was used after the grades were posted.

This study raises issues concerning how E-focused coping may facilitate or impede P-focused coping. For example, emphasizing the positive aspects of a stressful encounter may facilitate P-focused coping while self-blame may impede P-focused coping (Lazarus & Folkman, 1984). Although Folkman and Lazarus' (1985)

study examines a stressful event as it unfolds, it is difficult to generalize their findings to other stressful contexts because of the specific nature of the situation.

Folkman, Lazarus, Dunkel-Schetter, DeLongis, and Gruen's (1986) recent article adds further information on P-focused and E-focused coping. They interviewed 75 married couples once a month over a 6-month period. Subjects were asked to identify the most stressful encounter during the past week and then to respond on a revised 51-item WCC (Folkman & Lazarus, 1985). Part of the assessment was done intraindividually (comparing the same person with himself or herself over 5 stressful encounters). Findings indicated that coping was differentially related to satisfactory and unsatisfactory outcomes (i.e., for work situations satisfactory outcome was characterized by higher levels of P-focused coping) and that coping strategies vary depending on what is at stake and on what options the individual had for coping. Interestingly, specific combinations of P-focused coping and E-focused coping were identified. For example, individuals used a planful problem-solving (P-focused) coping strategy in conjunction with a self-control (E-focused) coping strategy for encounters involving a goal at work more often than other forms of coping. Furthermore, Folkman et al. (1986b) speculate that emotional self-control

may facilitate problem-solving especially in the work situation and that seemingly contradictory coping strategies can facilitate each other in many coping situations.

In summary, although P-focused and E-focused coping were used by all subjects in almost every stressful incident, individuals who used more P-focused coping appeared to be less stressed than those who relied on E-focused coping (Billings & Moos, 1981; Finn, 1985; Lazarus & Folkman, 1984). P-focused coping appears to be used more frequently in work-related situations while E-focused coping seems more relevant for health-related stressors (Folkman & Lazarus, 1980; Pearlin & Schooler, 1978). Interestingly, P-focused coping may be facilitated by E-focused coping (Folkman et al., 1986b) in stressful situations. However, generalizations are confounded as some studies identify a stressful event or role while others identify a specific stressful incident.

Measurement of Coping

The assessment of how an individual copes with stress poses one of the major problems in current research. According to Folkman and Lazarus (1985), three criteria must be satisfied to study coping as a process: (a) a specific stressful encounter must be examined, (b) what the person actually did or thought in the encounter must be described, and (c) continuous

assessments must be made during the encounter to examine changes over time.

One of the most widely used inventories, WCC (Folkman & Lazarus, 1980) requires an individual to summarize a recent stressful event and respond to 68 statements that describe ways of dealing with the event. Researchers have used variations of this inventory creating subcategories within the broader strategies of P-focused and E-focused coping. Consequently, findings are sometimes difficult to interpret. For example, Folkman and Lazarus (1980) classify "talked to someone who could do something about the problem" as P-focused on a subscale while Vitaliano et al. (1985) categorizes it as social support on a subscale. Some researchers have factor analyzed the WCC and have found different subcategories which may be due to using different populations and stressors (Folkman & Lazarus, 1985; Vitaliano et al., 1985).

Another measurement issue concerns consistency of coping behavior. Some investigators have questioned the assumption that coping is consistent across situations (Folkman & Lazarus, 1980). To date only a few studies have examined cross-situational consistency. Stone and Neale (1984) report that people are relatively consistent in the coping strategies they use with the same problem on different occasions. In

their study 60 married couples completed a coping questionnaire over 21 days. The subjects described the most stressful event of the day and then rated on a scale of 1 to 100 how stressful the event was. In contrast, a study by Folkman and Lazarus (1985) supports their original hypothesis that coping was more variable than stable when looking at how an individual copes with a specific event (i.e., a test) over three different stages. It appears that by examining how people cope with an event as it unfolds rather than as an isolated event, valuable information would be provided about consistency. Studying coping over a variety of situations would also help clarify whether those people who shift from one strategy to another cope more effectively than those people who rely on specific strategies for most problems.

In summary, a standard way to assess coping has not yet been found. Some studies identify a stressful event (i.e., illness) and measure coping generally, while others identify a specific stressful event but do not measure the individual's coping strategies over time. It seems that to measure coping effectively one would have to focus on a particular area (work, home, or illness), then isolate specific incidents and assess which strategies are used to deal with the stressful events. Perhaps, then a pattern will emerge, if indeed individuals do have coping patterns. Coping research

to date seems to be trying to encompass too many variables in too many different situations rather than focusing on a specific area (i.e., work) and measuring the strategies an individual uses across work-situations.

Gender Differences in Coping.

In addition to measurement problems, researchers are finding gender differences in coping. Folkman and Lazarus (1980), in a study of 100 middle-aged community residents, found that men used more P-focused coping than women, but only at work and in situations requiring acceptance. Women and men did not differ in their use of E-focused coping. Interestingly, women had significantly higher scores than men on both P- and E-focused coping scales. Pearlin and Schooler's (1978) study support these findings and also suggest that because the men in their study used more P-focused coping, they were more effective copers than women. However, commonly cited stressors for men were occupation-related while parenting and marital stressors were cited by women. Furthermore, the respondents in the study were asked how they usually coped with general sources of stress not how they actually coped in specific situations.

To properly examine gender differences in work-related coping would require a sample of men and women from similar jobs. Menaghan and Merves (1984)

suggest that female gender is not associated with less adaptive coping efforts. Data for their study was drawn from 1106 city residents (517 employed). Participants were interviewed regarding source of occupational stress (i.e., workload, depersonalization, inadequate benefits, and noxious environment). The major coping factors identified were: (a) direct action, (b) optimistic comparison (comparing one's situation to the past or to peers), (c) selective inattention (focusing only on positive work situations), and (d) conscious restriction of expectations (i.e., focus on monetary awards). Findings indicated that optimistic comparison was associated with reduction in stress over time for both males and females. However, men were more likely to use restriction of expectations rather than selective ignoring. Additionally, men reported more work-related (i.e., overload) problems than women but did not differ in experienced depersonalization at work. Women were more likely than men to use negotiation, a strategy associated with reduced stress. There was no evidence that coping efforts had different effects for men and women. Results could be misleading as participants were asked how they handled sources of stress in general rather than how they dealt with specific situations.

Stone and Neale (1984) studied the coping responses of 60 married couples over a period of 21 days. The subjects were asked to describe the most stressful event of the day or an anticipated future stressful event and to indicate which coping style they used or would use for each event. Results indicated that men prefer instrumental (P-focused) coping while women prefer E-focused coping. However, it should be noted that the magnitude of the coping differences was small and statistical significance in this study may have been due to the large number of problems analyzed (over 2,000 for each coping strategy). Another weakness in the study concerns asking the individual to anticipate how they will cope, which could be considered a trait measure and as such gives little information on how the individual did cope.

Astor-Dubin and Hammen (1984) found that women utilized both behavioral and cognitive strategies while men used mostly cognitive strategies for dealing with stressful life encounters. Subjects were stressed college students ($n = 170$) who completed a questionnaire listing at least one stressful event. Perhaps, different coping patterns would have emerged if the subjects were studied over time.

In summary, from the studies reviewed (Folkman & Lazarus, 1980; Menaghan & Merves, 1984; Pearlin & Schooler, 1978; Stone & Neale, 1984), there is some

support for gender differences in coping. However, the only consistent finding is that women use more P-focused and E-focused coping than men in most situations. Additionally, study designs have failed to match men and women on marital status, occupational status, and socio-economic status yet they are often compared to each other based on these categories.

Stress-Management Treatment Packages--Outcome Research

Traditional treatments for coping with stress have involved behavioral techniques such as relaxation and meditation, and more recently, cognitive techniques such as stress inoculation and thought stopping (Woolfolk & Lehrer, 1984). A promising intervention, physical activity, has also been used as a treatment for stress-management (Long, 1984).

Kazdin and Wilson (1978) propose that the comparison of two treatment packages is considered viable for outcome research when the primary commitment is to discover a treatment to accommodate a clinical problem. In addition, the use of different active treatments increases the likelihood that credibility and expectancy will be similar across groups, yet may allow conclusions about different active ingredients (Kazdin, 1980). Since Progressive Relaxation (PR) programs have been shown to be effective in reducing trait and state anxiety, changing mood, and increasing the ability to relax for a wide variety of problems and

people (Cangelosi, 1980; Heidi & Borkovec, 1983; Wood, 1978; Woolfolk et al., 1982), in this study it will be used as a standard with which to compare a less well established treatment (aerobic exercise) as a stress-management intervention.

Exercise Interventions

The psychological and physical benefits of aerobic exercise have been widely accepted (for reviews see Astrand & Rodahl, 1977; Eide, 1982; Folkins & Sime, 1981; Ledwidge, 1980; Mihevic, 1982). An early study by deVries (1968) linked both the physical and psychological benefits of exercise. deVries found exercise to be a natural muscle relaxant because it reduces the electrical activity in the muscle and this feedback may allow the individual to rate himself or herself as less anxious. Evidence to support this notion was found in a comparison of meprobamate, a tranquilizer, and exercise in a controlled research study. No significant differences were found among groups using meprobamate, a placebo group (pill), or a control group (sitting reading). However, the exercise group showed lower bodily tension as measured by EMG.

In recent years researchers have suggested that aerobic training programs can be used to change psychological functioning in predicted directions (e.g., Morgan, 1981; Young & Ismail, 1976). Several investigators suggest that vigorous exercise, usually

jogging or walking, results in significant reductions in self-reported anxiety (Hilyer & Mitchell, 1979; Long, 1984). In addition, evidence is accumulating that exercise may play an important role in stress reduction in both clinical and non-clinical populations. However, subjects from both populations tend to be sedentary individuals (Doyle et al., 1983; Folkens et al., 1972; Hilyer & Mitchell, 1979; Young & Ismail, 1976). The following studies are reviewed as support for the potential therapeutic effects of aerobic exercise as a stress-management intervention.

Reduced anxiety, enhanced self-efficacy and learning new coping strategies are important outcomes that may account for exercise as an effective stress-management intervention (Jasnoski & Holmes, 1981; Long, 1984). According to Lazarus and Folkman (1984) exercise is an E-focused coping strategy because it reduces physiological arousal. Thus an individual perceives himself/herself as less anxious. Exercise was used as a stress-management intervention in a controlled experiment by Jasnoski and Holmes (1981) who assessed 103 undergraduate women aged 17 to 31 before and after they participated in a 15-week aerobic training program. The measures used were personality tests and Cooper's 12-minute run (Cooper, 1968). Findings indicated that initial levels of aerobic fitness (as measured by 12-minute walk/run),

participation in an aerobic program per se, and changes in aerobic fitness were related to more positive personality functioning. Specifically, (a) initial levels of fitness were related to self-assurance and greater emotional stability, (b) participation per se was related to self-assurance and increased easy-goingness, and (c) improvements in fitness were related to increased self-assurance and decreased tension. Since the subjects were normal college students few changes on these personality measures could be expected (e.g., clinical depression). Another problem with this study was lack of a comparison group and failure to ascertain if the subjects were anxious prior to the program. Also, an improvement of 10% in the 12-minute walk/run could be considered a practice effect rather than a training effect. It would have been interesting to compare the results at posttreatment to a follow-up session to see if the changes in psychological variables were maintained over time, an important consideration for any intervention.

A controlled study by Long (1984) found that subjects reduced anxiety and increased self-efficacy as the result of an exercise intervention. Seventy-two chronically stressed female ($n = 48$) and male ($n = 25$) community residents aged 24 to 65 were randomly assigned to a 10-week exercise intervention or a cognitive therapy (stress inoculation). Results

indicated that treatment groups increased perceived self-efficacy and reduced state and trait anxiety compared to a waitlist group. In addition, continued reports of less anxiety and increased self-efficacy were maintained at 15-month follow-up (Long, 1985). Furthermore, it was concluded that participation in an aerobic exercise (walk/jog) program was a viable alternative to stress inoculation as a stress-management treatment. This research is one of the few methodologically sound empirical studies on exercise as a treatment.

Interestingly, Jasnoski et al. (1981) assessed whether physical fitness or merely participation in an endurance program mediates psychological change. These researchers compared women ($n = 20$) in a 10-week aerobic exercise class with a waitlist control ($n = 8$) and an independent control condition ($n = 11$). Findings indicate that participation per se improved scores in self-perceived abilities (self-efficacy) in relation to jogging as well as self-confidence compared to the control groups. However, one threat to the internal validity of this study was the lack of random assignment to the three groups. Significant differences between individuals who choose to exercise, as compared to those who are assigned to exercise, may exist that could account for the benefits exercisers receive from such activity. Thus, although this study

has methodological problems there appears to be support for exercise participation per se as a viable stress-management intervention for sedentary women.

In addition to the non-clinical studies reviewed above a growing body of literature is accumulating to attest to the efficacy of exercise treatment for depression (for a review see Simons, Epstein, McGowan, Kupfer, & Robertson, 1985).

Although depression is not a topic for this paper, one controlled study supporting participation per se in an exercise program will be examined. McCann and Holmes (1984) tested the effects of aerobic exercise, a placebo group (relaxation instructions), and a no-treatment control group on a sample of 43 college women. Subjects were selected on the basis of extreme scores compared to other college students on the Beck Depression inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). In addition, all subjects completed Cooper's 12-minute walk/run fitness test before the 10-week treatment. Results indicated that the exercise group showed a significant improvement in depression compared to the placebo and no-treatment group. Since expectancy was similar for all groups and since the subjects showed improvements in depression after 5-weeks into the program, it was suggested that change was due to participation per se rather than the conditioning effect. One problem with this study

concerns generalization of results from perhaps less depressed college students to a depressed population in a clinical setting.

In summary, participation in an exercise program is related to reductions in anxiety and increases in self-efficacy. However, most studies suffer from design problems. For example, threats to internal validity include: (a) failure to randomly assign subjects to groups, (b) failure to use a comparison group or a control group, and (c) failure to use appropriate measuring instruments (i.e., using clinical instruments to measure a non-clinical population). Threats to external validity include: (a) generalization of treatment (i.e., treating non-anxious subjects and generalizing to an anxious population), and (b) using university subjects (e.g., generalizing to clinical patients). In addition, although the use of follow-up assessments to determine maintenance of behaviors is recognized as essential for an effective treatment few studies use follow-up procedures.

Progressive Relaxation

Progressive Relaxation (PR) was developed by Edmond Jacobson, a physiologist, in 1938. The purpose of PR is to rid the body of residual tension, which is left over tension after an untrained person tries to relax. According to Lazarus and Folkman (1984), PR would be considered an E-focused coping strategy as it

reduces physiological response (muscle tension) and an individual perceives himself/herself as less anxious. PR training consists of learning to tense and relax various muscle groups throughout the body while at the same time paying close attention to the feelings associated with both tension and relaxation. This technique for relaxing is called PR because each of the major muscle groups is relaxed one after the other and as a new group is added a person simultaneously relaxes the other parts until total body relaxation is achieved.

Numerous studies have examined the effects of PR on the reduction of anxiety (for reviews see Barrios & Shigetomi, 1979; Borkovec & Sides, 1979; Lehrer & Woolfolk, 1984). Evidence supporting the use of PR as a therapeutic technique for tension reduction comes from areas such as health behavior, for example tension headaches (Blanchard, Andrasik, & Silver, 1980), hypertension (Redmond, Gaylor, McDonald, & Shapiro, 1974), and insomnia (Borkovec & Fowles, 1973; Turner & Ascher, 1979). Additionally, research findings indicate that PR is an effective treatment for phobias (for reviews see Borkovec & O'Brien, 1976; Mathews, 1978), and test anxiety (Reed & Saslow, 1980). Furthermore, in relation to general anxiety, findings indicate that PR is superior or equal to other therapeutic techniques when the research design

includes stressed subjects and random assignment (Gross & Fremouw, 1982; Woolfolk et al., 1982). Since the ability to use relaxation in a stressful situation outside of the training session is the most vital test for any therapy, two studies that have measured the generalized effects of training will be reviewed.

Woolfolk et al. (1982) found PR and meditation equally effective in ameliorating symptoms of daily stress for 34 stressed community residents. Subjects were randomly assigned to PR, meditation, and a self-monitoring control. Both treatment groups showed significant improvements on anxiety, somatic arousal, and were calmer than control subjects. These gains were either maintained or enhanced at 6-month follow-up.

Similarly, PR and Cognitive Restructuring treatments both showed decreased anxiety compared to a waitlist control group (Gross & Fremouw, 1982) for 63 speech-anxious undergraduates who were randomly assigned to each group. Treatment groups met for 5 hours and outcome measures were overt behavior (video-tape of speech), state anxiety, fear, social anxiety, and heart rate. Interestingly, both treatment groups improved on the self-report measures compared to a waitlist group but behavioral and physiological measures did not discriminate between the treated and untreated groups.

Consequently, because PR is a well-researched treatment for reducing anxiety in this study it is considered a standard stress-management technique with which to compare an aerobic exercise program. In addition to reducing anxiety, individuals also appear to improve their self-efficacy as a result of stress-management programs. The concept of self-efficacy will be discussed in the next section.

Self-efficacy Theory

Bandura's Social Learning Theory (Bandura, 1977) attempts to predict and explain behavior change using the concepts of self-efficacy and outcome expectations. Self-efficacy expectations are defined as convictions that one can successfully execute behaviors that will lead to successful coping while outcome expectations are defined as an individual's estimate that a given behavior will lead to a certain outcome (Bandura, 1977). Both efficacy and outcome expectations reflect a person's belief about capabilities and behaviors. Self-efficacy expectations are considered to affect both the initiation and persistence of coping behavior as well as people's emotional reactions such as anxiety or distress and thought patterns (Strecher, DeVellis, Becker, & Rosenstock, 1986). Thus, individuals with high levels of self-efficacy about a particular task will be less anxious and more confident in performing the task than those low in self-efficacy.

Self-efficacy theory predicts that performance based treatments will not only lead to higher levels of perceived self-efficacy, but may also lead to more generalized expectations of self-efficacy. Stress-management interventions have been shown to increase an individual's self-efficacy. For example, Long (1984) found that chronically stressed community residents ($N = 73$) significantly increased their general self-efficacy after a 10-week aerobic exercise intervention or a cognitive therapy. Similarly, Ewart, Taylor, Reese, and Debusk (1983) studied 40 men aged 52 to 59 after a myocardial infarction and found that subjects improved their self-efficacy after a treadmill test and a counselling session. The subjects who performed better on the treadmill test showed greater increases in self-efficacy than subjects who performed poorly. The counselling session not only increased specific exercise self-efficacy but increased more general self-efficacy (e.g., efficacy regarding sexual activity). From these examples it appears that changes in behavior (i.e., aerobic exercise and progressive relaxation) may be mediated by changes in perceived self-efficacy.

Self-efficacy expectations not only increase as the result of an intervention (as shown above) but have been found to be more accurate predictors of performance than outcome expectations (Bandura, 1977;

Lee, 1982, 1984).

Since there are few, if any, well-researched studies on progressive relaxation and aerobic exercise investigating self-efficacy as a predictor variable of behavior, evidence supporting this theory will be explored in research on smoking cessation (Condiotte & Lichtenstein, 1981), obesity treatments (Mitchell & Stuart, 1984), and an exercise treatment (Kaplan et al., 1984).

Condiotte and Lichtenstein (1981) assessed 78 cigarette smokers aged 16 to 70 who participated in smoking cessation programs. Measures used were: (a) a self-monitoring diary, (b) a specific self-efficacy smoking questionnaire, (c) an informant's report, and (d) a mood states assessment. Both groups (individual/group treatments) significantly enhanced perceived self-efficacy. Furthermore, higher levels of perceived self-efficacy at posttreatment were strongly related to longer periods of abstinence after the treatment and at 6-month follow-up. However, subjects were not randomly assigned and one treatment used individual programs while group programs were used for the other. Although expectancies for the groups were similar even though the intervention strategies varied, it is difficult to generalize from individual to group treatment. Also, the statistical analysis for this study used many individual t-tests.

Mitchell and Stuart (1984) found (414 female Weight Watcher members aged 20 to 65) that dropouts ($n = 101$) were more likely than stayers to report low self-efficacy at pretest. Interestingly, perceived success rather than actual success seemed to be related to predicting who would drop out (both groups lost the same amount of weight). This is congruent with Bandura's (1977) theory that success in a treatment does not always produce strong expectations of self-efficacy because sometimes individuals fail to perceive themselves as successful, perhaps due to repeated previous failure. In addition, since Weight Watchers' treatments are very behaviorally oriented, perhaps too little attention is being paid to increasing the participants self-perception of success.

Kaplan et al. (1984) found that a specific self-expectancy for walking was positively correlated with adhering to a regular walking program for 60 older adults with Chronic Obstructive Pulmonary Disease. In this study subjects were randomly assigned to treatments of behavior modification, cognitive modification, cognitive-behavioral modification or an attention-control group. All were given individual exercise prescriptions prior to the group meetings. At 3-month follow-up the treatment groups increased their activity level and their specific walking self-efficacy. The researchers also suggested that

specific rather than generalized expectancies mediate behavior changes. However, this is contrary to Bandura's (1977) theoretical notion that expectancies of personal mastery are likely to generalize once they are initiated. Furthermore, since enactive treatments present the most influential source of information (Bandura, 1977), they not only lead to higher levels of perceived self-efficacy but perhaps to more generalized expectations of personal self-efficacy. Therefore, high levels of self-efficacy, once established, are thought to generalize to other stressful situations (Ewart et al., 1984).

In summary, from the studies reviewed it appears that changes in self-efficacy are associated with behavioral change (Condiotte & Lichtenstein, 1982; Ewart et al., 1983). Additionally, researchers have shown that self-efficacy can be enhanced as the result of an intervention and may be an effective predictor variable for adherence to an intervention. More specifically, Bandura's (1978) conceptualization of self-efficacy would suggest that the level of self-efficacy is related to persistence in behavioral functioning and that as a result of a change in perceived self-efficacy it may be possible that behavior (e.g., participation in exercise) will persist.

Adherence to Exercise Programs

Current research suggests that the majority of people who start an exercise program will stop within the first few months (Dishman, 1982; Martin & Dubbert, 1985). According to Dishman (1982), variables that have been found to effect exercise participation and exercise adherence include psychological factors such as self-efficacy. However, for the physical benefits of exercise to accrue, from even low levels of activity, exercise must be performed on a regular basis at least three times a week (American College of Sports Medicine, 1980). According to the research reviewed it appears that individuals who score higher in self-efficacy will persist longer at a task. Perhaps, improvement in self-efficacy during a stress-management intervention will not only lead to a new coping strategy but to greater adherence to an exercise program.

Summary

In summary, evidence has been presented to support: (a) Folkman and Lazarus' (1980) theory that there are two basic functions of coping--P-focused and E-focused (Lazarus & Folkman, 1984; Moos & Billings, 1982), (b) that P-focused coping is associated with lower levels of stress (Billings & Moos, 1981; Finn, 1985), (c) that women compared to men use more P-focused and E-focused coping in most stressful

situations (Astor-Dubin & Hammen, 1984; Folkman & Lazarus, 1980), and (d) that measurement of coping has not yet been standardized (Lazarus & Folkman, 1984; Vitaliano et al., 1985). With regard to stress-management interventions, aerobic exercise has been shown to decrease anxiety and increase self-efficacy (Ewart et al., 1983; Long, 1984). Additionally, self-efficacy has been found to correlate with adherence to an enactive treatment (Condiotte & Lichtenstein, 1981; Kaplan et al., 1984).

Method

Subjects

The subjects were solicited via posters and articles in local newspapers offering working women relaxation or exercise stress-management programs. Of the 150 respondents 83 were personally interviewed following telephone screening (see Appendix A for telephone screening and interview forms) and 72 were accepted for the program after meeting the following criteria: (a) the women were able to identify at least two work-related stressors, (b) they scored 5 or above on Walk's (1956) Tension Thermometer, (c) they were exercising less than 3 times per week for less than 30 minutes during the past 3 months, (d) they were medically fit to participate in the walk/jog program as screened by Par Q (Chisholm, Collins, Kulak, Davenport, & Gruber, 1975), and (e) they were willing to be randomly assigned to either program. In addition, all participants were asked to pay a nominal fee (\$15.00). Fees were waived for subjects who could not afford the fee ($n = 3$). See Appendix B for the Par Q and Tension Thermometer.

The participants were working women, aged 24 to 59 ($M = 39.8$, $SD = 9.6$). Thirty-three percent were married, 33% were single and the remaining 34% were widowed, separated, or divorced. Sixty-four percent of the participants had a university education and 36% had

a college or high school education. A summary of subject characteristics is presented in Table 1.

At pretest the most frequent work-related stressors were a demanding workload (54.6%), and interpersonal conflict (41.0%). Appendix C contains examples of perceived stressors.

Although 72 respondents met the requirements for the study and completed the questionnaires at the initial interview, 11 subjects did not attend the first treatment session. Reasons for not attending included not having time ($n=7$) or they had already initiated an exercise program ($n=4$), thereby reducing the number of subjects to 61 (Exercise $n=31$, Relaxation $n=30$).

Design and Procedures.

All subjects were screened through a personal interview held at the University of British Columbia. After signing an informed consent the following questionnaires were administered: Tension Thermometer, WCC, Par Q, 7-Day Recall. The researcher did not know until the last 5 minutes of the interview to which treatment the subject was assigned, at that time a randomly chosen envelope was opened containing a form indicating group assignment. The subjects were then told the date, time and place of the first group meeting. Prior to the beginning of the first session, the STAI-T and General Self-efficacy Scale were administered. At the end of the first treatment

Table 1

Subject Characteristics-----
Demographics (N = 72)

Age (mean, range)	39	24-59
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Marital Status

Married	33%
---------	-----

Single	34%
--------	-----

Div/Sep/Wid	33%
-------------	-----

Children

1 or more children	54%
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No children	46%
-------------	-----

Education

High School	28%
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1-3 Years College	12%
-------------------	-----

University/College Degree	51%
---------------------------	-----

Professional Degree (MA, PhD)	9%
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Years in Workforce

0-3	17%
-----	-----

4-6	18%
-----	-----

7-9	21%
-----	-----

10-over	44%
---------	-----

Years in Present Position (mean, range)	5.5	1-10
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session the expectancy questionnaire was completed. All of the subjects were reassessed with the above mentioned questionnaires at the end of the 8-week treatment period. Eight weeks after completing the program all of the subjects met in a group at the University of British Columbia and were reassessed in the same manner as at 8-week post-treatment.

Dependent Measures

Trait Anxiety. Anxiety was measured with the Trait Anxiety Inventory (STAI-T) developed by Spielberger, Gorsuch, and Lushene (1970). The STAI-T measures relatively stable individual differences in anxiety proneness that appear to characterize the subject over a wide range of situational variables. It reflects a tendency to manifest a stress reaction to a variety of circumstances, thus evidencing chronic tension. The STAI-T has been used as an outcome measure in both relaxation and exercise treatment programs. This inventory is a brief self-report measure consisting of 20 statements responded to on a 4-point scale (ranging from 1 "almost never" to 4 "almost always") with high scores reflecting tension, apprehension, and fearfulness. Reliability and validity coefficients are well within tolerance levels (.73 to .92) and extensive evidence has been presented to support the validity of the STAI (Spielberger et al., 1970).

General Self-efficacy Scale. Sherer et al. (1982) developed a measure to assess general self-efficacy which was based on Bandura's (1977) self-efficacy theory. This scale consists of 17 items responded to on a 14-point Likert scale (yielding a sum ranging from 17 to 238) where high scores indicate high self-efficacy (see Appendix D). In the study by Sherer et al. which utilized introductory psychology students, the General Self-efficacy Scale demonstrated high internal consistency (Cronbach's $\alpha = .86$), and criterion validity was supported by predicted past success in vocational, educational and military areas. Construct validity was demonstrated by confirming several predicted relationships between scores on the self-efficacy scale and on other personality measures (Sherer & Adams, 1983). Test-retest reliability has not been established for this measure.

Ways of Coping Checklist (WCC). Folkman and Lazarus (1980) developed a questionnaire to measure how a person copes with a specific stressful event. Their original WCC was scored on a binary yes/no response scale while the more recent version (Lazarus & Folkman, 1984) is scored on a 4-point scale. A recent stressful event is identified and then a checklist consisting of 67 items responded to on a 4-point scale (from "not used" to "used a great deal") is answered with the described stressful event in mind.

The checklist incorporates two categories of coping: (a) problem-focused coping items (P-focused) that describe cognitive problem-solving efforts and behavioral strategies for managing the source of the problem (e.g., I made a plan of action); and (b) emotion-focused coping items (E-focused) that describe the cognitive and behavioral efforts directed at managing emotional distress (e.g., I tried to forget the whole thing). Internal consistencies for the P-focused and E-focused scales were examined in a study of 100 community residents and the mean (for 2 administrations of each scale) alpha coefficient was .80 for the P-focused and .81 for the E-focused (Folkman & Lazarus, 1980). A modification of this measure (2 subscales) was used in this study and is described in detail in Appendix E.

7-Day Recall (see Appendix F). Self-report measures of physical activity that have good psychometric properties are difficult to obtain due to problems in accurately measuring exercise. Blair (1984) developed a self-report inventory which requires subjects to record their pattern of physical activity over the past week. In addition to type of activity, subjects recorded frequency (in days), duration (in minutes), and intensity. Intensity was recorded as the subject's subjective feelings of fatigue with each activity rated on a scale of 6 to 20 (Borg, 1973).

Activities not of an aerobic nature (e.g., stretching) or of a work-nature (e.g., scrubbing floors) were not included. Since exercise participation, rather than level of fitness was the focus in this study, the 7-Day Recall was used to describe change over time at pre, post and follow-up for all groups.

Sallis et al. (1985), in a survey of community residents ($N = 2,126$), found that a version of the 7-Day Recall was an appropriate measure to indicate the pattern of activity, total caloric expenditure, and the types of activities for a large population. In addition, test-retest reliability was established ($n = 53$) over a two week period. The Pearson product-moment correlation between the number of vigorous activities reported at each interview session was $r = .83$ while for moderate activity it was $.75$. Taylor et al. (1984) compared data from the 7-Day Recall inventory to a direct measure of physical activity and self-reported physical activity for 30 males with a mean age of 52 years. The 7-Day Recall was interviewer-administered and asked; (a) how many hours of sleep the subjects had, and (b) how many hours of activity they engaged in (i.e., they were given examples of moderate, hard and very hard activities). The researchers found that the 7-Day Recall significantly agreed with self-report physical activity and direct measures of physical activity. One problem with this study may be that the

self-report (log book of activities) enhanced the accuracy of the 7-Day Recall. Versions of the 7-Day Recall have been utilized in other studies (Long & Haney, 1986; Sallis et al., 1985; Wallace, McKenzie, & Nader, 1985). Physical activity was measured using the total number of days (Exday) and the product of duration in minutes times intensity (Exefort).

Manipulation Check

An expectancy questionnaire was used to check the possibility that the experimental conditions generated different demand characteristics. Questionnaires were given after the first, last and 8-week follow-up sessions to see how confident the subjects were that the program would eliminate their anxiety (Kazdin, 1980). The three items were summed for analysis. In addition, to obtain a more objective measure of practice between sessions, an exercise or relaxation calendar was used to monitor exercise and relaxation practise from pre- to post-treatment. See Appendix F for a description of the expectancy items.

Ancillary Measures

A questionnaire was administered to all subjects at the end of the treatment and at 8-week follow-up to gain descriptive information about the treatments. Subjects were asked to estimate, on a 5-point scale, how well they were coping with stress and to what extent jogging or relaxation was helping them relieve

stress. In addition, they indicated how they felt and thought differently, and what they were doing differently as a consequence of the interventions and to what degree they achieved their goals for the program. (In the initial session all participants were asked to list three personal outcome goals). They were also asked what aspects of the program were helpful to them in learning to cope with stress. (See Appendix F for the post and follow-up questionnaire).

Treatments

The treatment groups (2 relaxation and 2 exercise) ranged in size from 14 to 16 participants. This is similar to the group size in other studies (Long, 1984). The groups met for eight 1 1/2-hour weekly sessions.

The main treatment components designed to be present in both the exercise (walk/jog) treatment and the relaxation treatment were: (a) an initial session discussing definitions, causes and effects of stress and presentation of a treatment rationale for stress-management, (b) the use of a self-monitoring form to record feelings, intensity and length of practice sessions, (c) a skill development approach to learning each technique, and (d) an informal supportive atmosphere with co-leaders acting as models and facilitators.

The treatment components that differentiated the two groups were relaxation through a progressive relaxation treatment and aerobic exercise through a walk/jog program.

Leaders. Initial screening interviews were conducted by the experimenter. The treatment groups were co-led by female graduate students in the masters of Physical Education program, and from Social Work and Counselling Psychology programs. All had experience leading adult groups and at least one leader per exercise group was qualified in first aid and cardio-pulmonary resuscitation. Before the treatments began and during the treatment sessions, a series of meetings were held to discuss the purposes of the project, the rationales behind the treatments, and the specific procedures involved in order to ensure similarity of approach across groups.

A treatment program similar to that described in Long's (1984) Stress-Management Aerobic Conditioning Manual was used for the exercise group while the relaxation treatments were based on Bernstein and Borkovec's (1973) Progressive Relaxation Training Manual. Hence, the detailed manuals prepared for both treatment conditions formed the basis for co-leader training.

Exercise Walk/Jog Program. A rationale for exercise as a stress-management treatment was presented

at the first session (i.e., exercise as a natural muscle relaxant and as a distractor). Then subjects were placed on a walk/jog program and were encouraged to increase their distance in a gradual manner. In the exercise group sessions, slow-stretch flexibility exercises were practised before and after each walk/jog. In addition, subjects were encouraged to practice 3 times per week on their own, recording the days they practiced, the amount of time they exercised and their feelings before and after exercise.

Prior to exercising as a group, successes and failures and any problems related to jogging were discussed in a supportive atmosphere. Then the group participated in 8-10 minutes of stretching exercises followed by a walk/jog of increasing lengths. While on the walk/jog, personal attention and encouragement was given to each participant. Subjects were encouraged to set their own pace on the basis of heart rate and perceived exertion. The final part of each session consisted of discussions and lectures on topics related to jogging such as: (a) proper running shoes, (b) injury prevention and treatment, (c) components of fitness, and (d) exercise principles and exercise maintenance.

Progressive Relaxation. The progressive muscle relaxation program consisted of two basic phases: (a) four sessions for the 16 muscle groups, and (b) three

sessions for the 7 muscle groups. The subjects were encouraged to practice as often as possible but at least 3 times per week on their own.

A rationale for Progressive Relaxation as a stress-management technique (tightening and relaxing muscles to attain complete relaxation, attaining homeostasis) was presented at the first session. Each group session consisted of an initial 10-15 minute review of the previous session and a discussion on how the subjects' practise sessions were going. The subjects then participated in the actual relaxation exercise. In addition, the later part of each session consisted of both small and large group discussions on: (a) what the experience was like for the participants, (b) the importance of practice, (c) common problems (cramps, focusing attention), (d) physiological and psychological changes as a result of relaxation, and (e) recognition and use of relaxation when tense.

To reduce attrition, participants in both groups were encouraged to phone the group leaders to review material that was missed. If the leader was not contacted she telephoned the participant. The average number of sessions attended was 5.9 of 8 sessions for all groups (Median = 6).

Results

Group Comparability on Demographics and Dependent Measures

Prior to the interventions, all subjects ($N = 72$) displayed evidence of anxiety as evidenced by STAI-T. The overall group mean of 46.1 was well above the mean score of 35.8 reported by Spielberger et al. (1970) for a group of normal male and female undergraduates.

Initially Chi-square tests were computed for the two relaxation (n 's=17, 17) and the two exercise groups (n 's=18, 20). Since no differences were found on the demographic variables of age, marital status, years in current job, and education, these four groups were collapsed into two treatment groups (n 's=25, 26) and one no show/dropout group ($n=21$) for analysis. No shows were the subjects who did not attend the first treatment session ($n=11$) while dropouts were subjects who attended 3 or fewer sessions or were unavailable for posttreatment or follow-up assessment ($n=10$). There were no significant differences among these groups for marital status, years in current job, or education, but there was a significant difference for age (Chi-Square (2, $N = 72$) = 7.35, $p < .03$). In the relaxation group the subjects were younger (66% were under 39 compared to only 40% for the exercise groups). However, as the correlations of age with all the dependent measures were very small (none above .13), it

is unlikely that this between-group age difference would influence treatment effects.

Subject Attrition

Of the initial 72 subjects, 11 (no shows) did not show up for the first session, and 8 (dropouts) did not attend more than 3 sessions, thus reducing the treatment group sample size to 53. Additionally, one subject could not be located for the posttest, although she attended 7 classes, one other subject was in the hospital at the time of posttest and one subject did not complete follow-up questionnaires although she attended 6 classes (her data were used for pretest and posttest analysis). Consequently, the final sample size was 50 ($n = 25$ for relaxation, $n = 25$ for exercise).

Compared to treatment groups the dropout group's mean score for self-efficacy (183.1) was considerably higher and for trait anxiety (39.0) was lower than the treatment groups score (see Table 2 for means and standard deviations). This is an indication that the dropout group was more self-efficacious and less anxious than the treatment groups.

Pretreatment Differences/Self-efficacy and STAI.

A one-way multivariate analysis of variance (MANOVA) was used to test for pre-treatment differences between treatment groups (relaxation and exercise) on the dependent measures of trait anxiety and self-efficacy

Table 2

Means and Standard Deviations of Outcome Measures

	STAI		Self-Efficacy		E-focused		P-focused		Exefort		Exday	
Group	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Exercise (<u>n</u> =25)												
Pre	46.6	9.2	168.3	32.2	11.3	7.5	16.7	7.0	483.6	953.5	1.1	1.5
Post	41.0	9.0	176.2	31.4	11.4	5.5	19.8	7.3	1358	629.5	3.7	1.3
Follow-up	37.9	7.7	180.9	24.2	9.7	6.2	18.1	7.1	1558	1635	2.9	1.9
Relaxation (<u>n</u> =25)												
Pre	48.6	10.0	146.6	36.1	13.6	10.2	14.5	8.5	487.2	662.6	1.0	1.4
Post	43.4	9.4	166.6	32.8	11.8	7.8	15.6	6.5	977.8	711.7	2.5	1.8
Follow-up	41.7	9.3	163.0	37.4	11.0	6.6	14.0	7.2	853.4	990.0	2.0	1.7

Note. STAI=Trait Anxiety, E-focused=Emotion-focused coping,
P-focused=Problem-focused coping, Exefort=minutes X
intensity of exercise, Exday=frequency in days.

(see Table 2 for means and standard deviations). The overall MANOVA was nonsignificant, $F(2,48)=2.90$, $p<.064$. The overall mean score of 157.8 for self-efficacy is lower than those reported by Sherer et al. (1982) for 376 college students ($M = 172.6$).

Coping and Exercise. A MANOVA was performed to determine if the groups differed initially in either of the coping subdomains (P-focused and E-focused). The MANOVA was nonsignificant indicating no initial differences between groups for coping, $F<1$. Therefore the groups did not differ in the number of P-focused and E-focused strategies they used prior to the treatment. Furthermore, a MANOVA on pretest exercise (Exdays, Exefort) was also nonsignificant, $F<1$, indicating that treatment groups had similar exercise habits before the treatments.

Manipulation Check

To evaluate the subjects' expectations of the interventions effectiveness, ratings were provided at pretest and posttest. A (2 X 2) groups by time ANOVA with repeated measures on time (pre to post) on expectancy revealed a significant group main effect, $F(1,49)=7.20$, $p<.009$, and a significant time main effect, $F(1,49)=4.87$, $p<.03$. There was no significant group by time interaction ($F<1$.) Although the overall relaxation group mean was lower than the exercise mean, both groups increased their expectancy similarly over

time. See Table 3 for means and standard deviations of expectancy scores.

Treatment Effects

Two two-way (group by time) MANOVA's with two preplanned nonorthogonal contrasts using Dunn's test for significance at .025 (pre to post; post to follow-up), were performed separately on: (a) trait anxiety and self-efficacy, and (b) P-focused and E-focused coping. Only the preplanned contrasts (pre to post) and (post to follow-up) are presented below when discussing the time effect.

Trait Anxiety and Self-Efficacy. A repeated measures, 2 X 3 (group by time) MANOVA with preplanned contrasts was performed to evaluate differential effectiveness between the treatment groups on the dependent measures of trait anxiety and self-efficacy. Analysis revealed a nonsignificant group main effect, $F(2,47)=2.04$, $p<.14$, and a significant time (pre to post) effect, $F(2,47)=11.39$, $p<.001$. The univariate tests for time were significant (trait anxiety, $F(1,48)=15.33$, $p<.001$ and self-efficacy, $F(1,48)=14.34$, $p<.001$). There was no significant group by time interaction for the pre- to posttreatment contrast, $F(2,47)=1.76$, $p<.183$. Examining the means it appears that the two treatment groups reduced their trait anxiety and increased their self-efficacy from pre- to posttreatment in similar magnitudes.

Table 3

Means and Standard Deviations of Expectancies Scores

GROUP	PRE	POST
<hr/>		
Exercise ($\underline{n}$ =26)		
<u>M</u>	14.0	15.7
<u>SD</u>	2.5	3.6
Relaxation ($\underline{n}$ =25)		
<u>M</u>	12.6	13.5
<u>SD</u>	2.6	3.7

To assess maintenance of change over the 8-week follow-up period a post to follow-up contrast was used. A time (post to follow-up) effect approached significance, $F(2,47)=3.49$, $p<.04$. The group by time interaction was not significant $F(2,47)=1.26$, $p<.292$.

An examination of the means indicated that from post to follow-up trait anxiety continued to reduce, while self-efficacy did not change. There is no evidence to suggest that the groups changed differently from pre- to posttreatment or at 8-week follow-up. For a summary of the MANOVA and univariate ANOVA's see Table 4.

Coping. A one-way MANOVA with repeated measures on time with preplanned contrasts was performed to determine if the combined groups changed over time on total number of coping strategies and if there was a differential change for P-focused and E-focused coping as hypothesized. Dependent variables were SUM (total number of coping strategies used) and DIFF (the difference score between the P-focused and E-focused coping strategies). For the pre- to posttreatment contrast on time, findings indicated a nonsignificant effect, $F(2,45)=2.34$, $p<.11$. This indicates that the total number of coping strategies used and the difference between the number of P- and E-focused coping strategies did not change significantly from pretest to posttreatment.

Table 4

Summary of Multivariate and Univariate Results for Outcome Measures

Effects	Multivariate (<u>F</u> , <u>p</u> <) <u>df</u>		Univariate (<u>p</u> <)	
		2,47	Self-Efficacy	Trait Anxiety
Group	2.04	.142	.055	.112
Time(pre to post)	11.39	.001	.001	.001
Group by Time	1.76	.183	.094	.213
Time(post to follow-up)	3.49	.038	.844	.011
Group by Time	1.26	.292	.133	.438
			Coping	P/E ^a
		2,45	SUM	DIFF
Time(pre to post)	2.34	.108	.448	.034
Time(post to follow-up)	1.74	.187	.066	.691
			Exercise	
		2,47	Exefort	Exday
Group	3.08	.055	.098	.016
Time(pre to post)	20.48	.001	.001	.001
Group by Time	1.69	.196	.185	.069
Time(post to follow-up)	4.32	.019	.831	.045
Group by Time	1.30	.282	.363	.701

^a See table 3.

To assess maintenance of coping behavior over the 8-week follow-up period a post to follow-up contrast was used. This effect was not significant, $F(2,45)=1.74$, $p<.19$. From post to follow-up there was no increase in the total number of coping strategies nor was there a significant difference for P- and E-focused coping.

Self-Efficacy as a Predictor. Pearson-product moment correlations between self-efficacy at posttreatment and exercise (Exefort and Exday) at follow-up showed no relationship, $r = -.017$ and $.039$, respectively. Therefore, there was no reliable association between scores on self-efficacy at posttreatment and aerobic exercise at 8-week follow-up.

Ancillary Measures

Exercise. To test for change in exercise pattern for both treatment groups a repeated measures, 2×3 (group by time) MANOVA was computed. Exercise was measured using Exday (number of days) and Exefort (minutes $\times$ intensity). The group main effect approached significance at $F(2,47)=3.08$, $p<.06$. The pre- to posttreatment contrast revealed a significant time effect, $F(2,47)=20.48$, $p<.001$. The univariate tests for time (pre to post) were significant for both dependent measures (Exday, $F(1,48) = 41.82$, $p<.001$ and Exefort, $F(1,48)=22.87$, $p<.001$). This indicates that both groups improved their exercise from pre- to

posttreatment. There was no significant group by time interaction for the pre- to posttreatment contrast, $F(2,47)=1.69$, $p<.20$. Therefore the groups did not change differently over time (see Figure 1). However, the large error variance may have obscured any group differences.

For the post to follow-up contrast there was a significant time effect, $F(2,47)=4.32$, $p<.02$. Univariate analysis revealed that Exday was significant, $p<.05$. However, Exeffort was not significant, $F<1$. Furthermore, the group by time interaction was not significant, $F(2,47)=1.30$, $p<.28$. Therefore, from an examination of the means, from posttest to follow-up both groups decreased the number of days they exercised.

Post and Follow-up Questionnaires. In response to the posttreatment question "To what extent did you achieve your personal goals?", the overall mean for the exercise group was 3.2 while the mean for the relaxation group was 2.6 on a 5-point scale ("somewhat" to "completely"). On the 8-week follow-up question "To what extent have you maintained your exercise/relaxation program?", 66% of the exercise group reported "somewhat" or "very much so" while only 32% made a similar response for the relaxation group. For the question "To what extent has jogging/relaxation helped you deal with stress?", 46% of the exercise

Figure 1: Pre, Post and Follow-up group means for Exercise Composite Score (minutes X intensity).

group and 28% of the relaxation group responded "moderately" or "very much so". Sixty percent of the relaxation group said they maintained relaxation due to setting an established pattern of practise compared to 58% of the exercise group (for exercise). The exercise group also rated "feeling good" (56%) and "health" (48%) as contributing to helping them maintain an exercise program.

Correlation Matrix. A correlation matrix for pre- to posttreatment measures will be used to quantify relationships which will be examined in the discussion section. See Table 5.

Table 5

Correlations of Dependent Variables and Other Selected Factors

	PROB1	EMOT1	PROB2	EMOT2	AGE	HST1	WST1	SELFEFF1	TRAIT1	EXDAY1
PROB1 119	1.0000									
EMOT1 120	-0.0542	1.0000								
PROB2 121	0.3536	-0.1834	1.0000							
EMOT2 122	0.0418	0.7192	-0.0351	1.0000						
AGE 31	-0.1450	-0.1308	-0.2528	-0.0495	1.0000					
HST1 32	0.0899	-0.3040	0.2424	-0.3108	0.0003	1.0000				
WST1 33	0.3316	-0.5431	0.1532	-0.4286	0.1899	0.4270	1.0000			
SELFEFF1 34	0.4510	-0.3346	0.2556	-0.3895	-0.1358	0.3868	0.5649	1.0000		
TRAIT1 35	-0.0756	0.5508	-0.2315	0.4499	0.1250	-0.4576	-0.4124	-0.5966	1.0000	
EXDAY1 36	0.1375	-0.1244	-0.0223	-0.2092	0.1913	0.0561	-0.1451	-0.1707	0.2343	1.0000
EXEFORT1 131	0.0784	-0.0733	0.0524	-0.0598	-0.0573	0.1489	-0.1534	-0.1477	0.1217	0.6413
EXPECT1 39	0.2860	-0.0658	0.0861	-0.0159	0.0157	0.1637	0.1805	0.2532	-0.1329	0.0542
HST2 70	-0.0248	-0.0037	0.0614	-0.2310	-0.2845	0.5510	0.2488	0.3555	-0.3387	-0.0339
WST2 71	0.1504	-0.2652	-0.1654	-0.3892	0.0023	0.3399	0.5432	0.3460	-0.2787	-0.1716
SELFEFF2 72	0.2832	-0.2557	0.1790	-0.4846	-0.2483	0.4550	0.4778	0.7863	-0.4933	-0.2032
TRAIT2 73	-0.1399	0.2793	-0.2039	0.3200	0.2276	-0.4812	-0.3371	-0.5471	0.7078	0.1829
EXDAY2 74	0.1216	-0.2570	0.1498	-0.3055	0.0628	0.0858	0.2532	0.3185	-0.3630	-0.0662
EXEFORT2 132	0.1471	-0.1462	0.1677	-0.2337	-0.0226	0.1245	-0.1548	0.0339	-0.1470	0.5138
EXPECT2 77	0.0301	0.0671	0.2516	-0.0019	-0.3488	0.1288	0.1452	0.0521	-0.0825	-0.0026
TOTGOAL 134	0.1511	0.0066	0.3328	-0.1303	-0.3960	0.0463	0.0364	0.1127	-0.0278	-0.0589
	EXEFORT1	EXPECT1	HST2	WST2	SELFEFF2	TRAIT2	EXDAY2	EXEFORT2	EXPECT2	TOTGOAL
EXEFORT1 131	1.0000									
EXPECT1 39	-0.0749	1.0000								
HST2 70	-0.0882	0.0897	1.0000							
WST2 71	-0.0985	0.0350	0.3277	1.0000						
SELFEFF2 72	-0.1467	0.2882	0.5701	0.4668	1.0000					
TRAIT2 73	-0.0199	-0.0460	-0.5718	-0.4621	-0.5761	1.0000				
EXDAY2 74	-0.1451	-0.1197	-0.0710	0.1859	0.1332	-0.1782	1.0000			
EXEFORT2 132	0.6232	-0.0047	-0.0094	-0.0077	-0.0539	-0.0727	0.0335	1.0000		
EXPECT2 77	0.0575	0.2640	0.2114	0.0004	0.1422	-0.1194	-0.2017	0.1036	1.0000	
TOTGOAL 134	0.0423	0.2702	0.1849	0.0660	0.2466	-0.1801	-0.0560	-0.0169	0.6078	1.0000

Discussion

The results of this study indicate that 8-week aerobic exercise and progressive relaxation interventions are effective in significantly reducing trait anxiety and increasing self-efficacy at posttreatment and 8 weeks later for sedentary working women. Unexpectedly, neither treatment significantly increased the total number of coping strategies. It was expected that self-efficacy at posttreatment would be positively related to jogging behavior at follow-up for the exercise group but this was not evident.

Both treatments generated similar responses; decreased anxiety and increased self-efficacy and these changes were maintained or improved at 8-week follow-up. These findings are similar to studies by Jarnoski and Holmes (1981) and Long (1984) who found that participation in an exercise program increased self-efficacy and decreased anxiety. Since there were no differences between groups, self-efficacy may have been increased by common components in each group such as: (a) participants gaining a sense of mastery (i.e., learning the technique of jogging or progressive relaxation), (b) learning a new coping skill, and (c) group support. In addition, while both treatment groups were taught a form of muscle tension reduction (deVries, 1968; Jacobson, 1938), subjects self-reported that they used jogging/relaxation (Exercise 68%,

Relaxation 72%) as a distraction and to gain a sense of control (Exercise 72%, Relaxation 48%) which is similar to findings by Long (1984). Arnkoff (1986) suggests that change processes resulting from a treatment cannot be predicted only from the content of treatment procedures. Therefore, future studies may want to focus on specific treatment components in relation to self-efficacy.

The total number of coping strategies did not significantly increase. This may be due to the assessment of coping as subjects were asked to describe a recent stressful event and then respond with how they coped with the event. It was expected that learning a new coping strategy (exercise/relaxation) would generalize to items on the WCC measure (e.g., tried to forget the whole thing; or changed something about myself) however, this was not evident from the results.

One explanation for these findings may be that coping strategies increased only within specific types of stressful work encounters. Rather than specifying the type of stressor, subjects were free to identify any work stressor. Thirty-eight percent of the subjects identified workload as a stressor while 43% identified interpersonal relationships at work as stressful and 19% identified other work stresses. Folkman et al. (1986b) found that coping strategies varied depending on what was at stake and what options

the individual had for coping. Future studies should consider looking at the different types of work stressors because it is possible that coping strategies tapped in this study were confounded by the type of stressor identified (Latack, 1986).

The notion of E-focused coping facilitating P-focused coping has been reported by Folkman et al. (1986b). P-focused and E-focused coping strategies did not change significantly over time but P-focused coping means differed in the direction hypothesized from pre- to posttreatment. Interestingly, the change in P-focused coping seems reasonable since the subjects were taught a new E-focused coping strategy (exercise, relaxation) which may have facilitated more P-focused coping, particularly in the work situation.

There appears to be a relationship between coping and the concept of self-efficacy. Initially, women who scored high on self-efficacy at pretreatment appeared to use more P-focused coping at pretreatment ($r=.45$, $p<.01$). There was a negative relationship between self-efficacy at pretreatment and E-focused coping at pre- and at posttreatment ($r=-.34$, $-.39$, $p<.01$); lower self-efficacy at posttreatment was related to a higher use of E-focused coping at posttreatment ($r = -.49$, $p<.01$). The notion that enhanced self-efficacy is related to lower trait anxiety ($r = -.58$, $p<.01$), and allows individuals to be less concerned over emotions

and more P-focused may be worthy of further study.

Self-efficacy increased significantly from pre- to posttreatment and was maintained at follow-up. However, self-efficacy assessed at posttreatment did not predict exercise behavior at follow-up for the aerobic exercise group. This is contrary to findings in other studies (Condiotte & Lichtenstein, 1981; Kaplan et al., 1984) where self-efficacy was found to be a good predictor of smoking abstinence and walking during and after an intervention. These studies however, used a specific self-efficacy measure at pretreatment to predict a specific behavior during or after a program. In this study, pretreatment self-efficacy/posttreatment exercise (Exefort) showed no linear relationship ($r = .03$). However, a general self-efficacy measure was used but was not related to a specific performance (jogging). The lack of a significant relationship may be due to: (a) problems with the measurement of exercise, or (b) a need for a longer follow-up period. In addition, contrary to Bandura's (1977) theory, perhaps a change in perceived general self-efficacy does not always lead to persistence in a specific behavior.

Despite the fact that the relaxation participants were instructed not to change their exercise patterns both the relaxation and the exercise participants increased their exercise over time. The reason both

groups increased their exercise may be due to: (a) the programs starting in snowy weather and continuing into the spring which could have influenced all subjects to walk/jog due to seasonal changes, and (b) the initial interview introducing the notion of exercise as a stress-management technique may have encouraged some of the relaxation group to exercise. In Long's (1984) study both groups improved their MVO₂ and it was suggested that the bike test was reactive.

Other studies (Jasnoski et al., 1981; McCann & Holmes, 1984) found that participation per se was related to less tension and increased self-efficacy. It may also be possible that "non-specific factors" influenced behavioral change. Furthermore, the 7-Day Recall measure may not be sensitive enough to measure improvement in exercise accurately. For example, as individuals increase their aerobic exercise they may assess the time and effort more realistically than nonexercisers.

While both groups improved in exercise the means indicate that the exercise group continued to exercise at follow-up while the relaxation group had a downward trend (see Figure 1). A similar pattern was found for Exday. At follow-up, 36% of the exercise subjects increased their exercise, 48% maintained their exercise and 16% decreased their exercise while for the relaxation group 24% of the subjects improved, 24%

maintained their exercise and 36% of the subjects decreased their exercise (16% did no exercise).

Although there is no statistical evidence to suggest that a jogging treatment is superior to a progressive relaxation treatment, open-ended self-report data from the subjects seem to indicate that the jogging treatment was perceived as more satisfactory or just as satisfactory as a progressive relaxation stress-management intervention. For example, 81% of the exercise subjects responded that the jogging program helped them (somewhat to often) cope better with stress compared to 76% of the relaxation group at posttreatment. However, 56% of the joggers said their mood changed from negative to positive as a result of jogging compared to 25% of the relaxation group (for relaxation).

Additionally, joggers tended to contribute maintenance of their program to: (a) feeling good (54%), (b) establishing an exercise pattern (50%), and, (c) better health (46%). For subjects in the relaxation group, establishing a pattern of practise (60%) helped them maintain relaxation. Future studies may want to explore these findings.

It should be noted that generalizability of results from this study are limited to sedentary working women who volunteered for a stress-management treatment to help them cope with work stress.

In summary, the results demonstrated that aerobic exercise was as effective as progressive relaxation in reducing anxiety and increasing general self-efficacy for sedentary working women. However, only self-report data were used to measure treatment outcome whereas a multimodal approach may have provided more specific information on outcome data (Kazdin, 1980). For example, future studies may incorporate both behavioral and physiological dependent variables to determine if the treatments produced the desired effects. More specifically, behavioral measures (e.g., observation in contrived situations) may be used to observe a subject's coping behavior while physiological measures such as an electromyogram (EMG) may be used as an objective indicator of relaxation.

The notion of coping as an outcome measure for stress-management treatments needs further research. In this study subjects were asked to identify how they coped with a work-related stressor during the past two weeks. It is possible that coping strategies changed only within specific types of work stressors (e.g., interpersonal, workload). Furthermore, although it was not tapped in this study, identifying the individuals who feel that they successfully dealt with the stressor may add to the theoretical knowledge base of coping (Menaghan & Merves, 1984).

In addition, researchers may want to explore the relationship between self-efficacy (as a general trait) and E-focused coping (in specific situations). There is some indication that for working women self-efficacy is negatively related to E-focused coping. Further study of this relationship may provide information on the issue of consistency in coping (i.e., do women who score low on self-efficacy consistently use E-focused coping in the work situation).

According to Bandura (1977) an individual's self-efficacy may be increased due to subjects gaining a sense of mastery, therapist modeling, persuasion, and teaching subjects to control physiological arousal. Since this study employed all of these methods future researchers may want to use a component analysis approach to more fully understand the reason for self-efficacy change (Kazdin, 1980).

In conclusion, aerobic exercise appears to be a viable stress-management intervention and researchers should continue to explore this area of research.

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APPENDIX A

Telephone Screening

Interview

Informed Consent

TELEPHONE PROTOCOL

Participants left their telephone number and name on a telephone answering service in the recreation department. All calls were returned within one week.

TELEPHONE INTERVIEW

RECORD SUBJECT'S

Name

Work Phone

PROCEDURES: (introduce self, and study)

The purpose of this study is to offer a stress-management program and to examine how you deal with stress. There will be a \$15.00 registration charge and participants will be expected to attend all sessions and a final one hour interview 8-weeks after the last session. Your involvement will be for 8 weeks, once a week for one and one-half hours in a group program. You will be given some paper and pencil psychological assessments at the first interview, during your last group meeting and during the final interview. There will be two programs offered, one will involve relaxation and the other will involve exercise as a means to deal with your stress. (Participants must be willing to be assigned either to a relaxation or exercise program).

Do you have any questions?

Would you like to participate?

Before we set a date for the initial interview I would like like to ask you a few questions.
Is there any reason why you may not be able to participate in an exercise program? (high blood pressure, leg problems).
How often do you exercise? (what type--must be less than 3 times per week--30 minutes or less).
When was the last time you exercised on a regular basis?
Have you ever been involved in a relaxation or stress-management program?
Would you prefer to participate in a program on Sat. or Sun. or would you prefer a Tuesday or Wednesday evening?
In the personal interview I will be asking you questions such as: "Can you describe situations at work which make you feel anxious, and What do you do when you feel stressed?"

Set the date and time for interview--leave phone number to contact if they can't make it.

Interview Protocol

Check the individual telephone sheet to make sure that both the work and home phone numbers are correct. Ask the subjects where they heard about the program. Ask them if they have any questions about the telephone call. Ask them to read the informed consent and verbally explain it to them before they sign it. Questions? (Basically it reviews what was said in the telephone call).

Do a review of time commitments eight one and one-half hour sessions--follow-up interview in May. Also mention that in the 8th session they will be asked to fill out questionnaires. The follow-up session will be similar to this interview only it will be done in small groups.

Go over the Par Q with all subjects. Ask them if there is any reason why they may not be able to participate in the exercise program. Check that they are exercising less than 3 times per week (for less than 30 minutes per session).

Ask the subjects to describe two chronic work stressors. This is to prepare them for the first questionnaire. After they have described the stressors ask them to fill in the Tension Thermometer. They must score 5 or over to be part of this program. Then ask them to fill out the first questionnaire---make sure they understand the initial instructions and clarify that after they have written out the stressor they will be answering the rest of the questions with reference to it (this will take from 15

to 20 minutes--leave the room).

Before filling out the next set of questionnaires give the subjects the following information on the programs.

(1) Both groups will consist of approximately 15 women with 2 co-leaders.

(2) The purpose of the first session will be to meet the other members of the group and to learn about stress. We will also discuss how the program you are in has been successful as a stress-management program.

(3) Explain the exercise program--a walk/jog individual program which will start at the level you are at and progress slowly with the intension of teaching you basic jogging skills.

(4) Explain Progressive Relaxation--you will learn to tighten and relax various muscle groups in your body so that you will be able to attain complete relaxation (you will be sitting comfortably in chairs while the leaders guide you through the relaxation process).

Have the subjects randomly select an envelope which indicates the group they will be in and give them a form with the time, date, location, parking area, and phone number of the group leader on it. (this form will also give instructions on what to wear for the first session). All participants will be telephoned a few days before the first session starts.

Thank them for coming.

INFORMED CONSENT DOCUMENT

Date: November, 1985

Purpose of the Study:

This investigation is being conducted to assist working women in managing their stress and anxiety.

Procedure:

As a participant you will be asked to do several things:

1. Take paper and pencil tests (20-30 minutes) at the beginning and end of the investigation.
2. Participate in 8 group training sessions which will not exceed 1 1/2 hours in length per session.
3. Return 8 weeks after the completion of the sessions for a one hour personal interview during which you will again complete paper and pencil tests.
4. Pay \$15.00

This is to certify that I, _____, hereby agree to voluntarily participate in this investigation on stress. I have been told that I do not have to participate in this investigation, that I am free to withdraw my consent and may terminate my participation at any time, and this will not jeopardize my opportunity to participate in other programs sponsored by U.B.C.'s School of Physical Education and Recreation. Anything I say or data that is collected will remain confidential with regard to my identity.

I understand that I am free to deny any answer to specific items or questions in interviews or questionnaires or during the training sessions.

I have had a chance to ask any questions I want about this investigation, and they have been answered to my satisfaction. I have also been told that I may ask any questions I have at any time during the investigation, and that they will be answered to my satisfaction.

date

participant's signature

Faculty Supervisor
Bonita Long

Investigator's Signature

APPENDIX B

Tension Thermometer

Par Q

PAST WEEK TENSION THERMOMETER

Think back over the past week. Take each day separately and remember as much as you can of what you did, how the day went, and particularly the level of tension you experienced. Now, use the thermometer below to rate your average level of tension for the past week.

- 10 completely tense (not relaxed at all)
- 9
- 8 very tense (only slightly relaxed)
- 7
- 6 tense
- 5
- 4 relaxed
- 3
- 2 very relaxed
- 1
- 0 completely relaxed (not tense at all)

PAR Q & YOU

PAR-Q is designed to help you help yourself. Many health benefits are associated with regular exercise, and the completion of PAR-Q is a sensible first step to take if you are planning to increase the amount of physical activity in your life.

For most people physical activity should not pose any problem or hazard. PAR-Q has been designed to identify the small number of adults for whom physical activity might be inappropriate or those who should have medical advice concerning the type of activity most suitable for them.

Common sense is your best guide in answering these few questions. Please read them carefully and check the ☒ YES or NO opposite the question if it applies to you.

YES NO

- ☐ ☐ 1. Has your doctor ever said you have heart trouble?
- ☐ ☐ 2. Do you frequently have pains in your heart and chest?
- ☐ ☐ 3. Do you often feel faint or have spells of severe dizziness?
- ☐ ☐ 4. Has a doctor ever said your blood pressure was too high?
- ☐ ☐ 5. Has your doctor ever told you that you have a bone or joint problem such as arthritis that has been aggravated by exercise, or might be made worse with exercise?
- ☐ ☐ 6. Is there a good physical reason not mentioned here why you should not follow an activity program even if you wanted to?
- ☐ ☐ 7. Are you over age 65 and not accustomed to vigorous exercise?

YES to one or more questions

If you have not recently done so, consult with your personal physician by telephone or in person BEFORE increasing your physical activity and/or taking a fitness test. Tell him what questions you answered YES on PAR-Q, or show him your copy.

Programs

After medical evaluation, seek advice from your physician as to your suitability for:

- ① unrestricted physical activity, probably on a gradually increasing basis.
- ② restricted or supervised activity to meet your specific needs, at least on an initial basis. Check in your community for special programs or services.

NO to all questions

If you answered PAR-Q accurately, you have reasonable assurance of your present suitability for:

- ① A GRADUATED EXERCISE PROGRAM - A gradual increase in proper exercise promotes good fitness development while minimizing or eliminating discomfort.
- ② AN EXERCISE TEST - Simple tests of fitness (such as the Canadian Home Fitness Test) or more complex types may be undertaken if you so desire.

postpone

If you have a temporary minor illness, such as a common cold.

If
You
Answered

APPENDIX C

Examples of Perceived Stressors

EXAMPLES OF PERCEIVED STRESSORS

Trying to keep up with the workload.

Tension due to a boring job.

Constant pressure--phones ringing.

Homework---Marking piling up--constant.

Heavy workload--tight deadline.

Visitors continuing to arrive on the job.

Constant interruptions.

Stressful union meetings.

Anxious about how a major project will turn out.

Unable to concentrate at work.

How I will express myself at business meetings.

Being blamed for problems which are not under my control.

Students not listening to instructions.

Pressures of emergency hospital work.

Reorganization of work setting (layoffs etc.).

Difficult clients.

Disruptive passengers.

Lack of morale on the job.

Boss difficult to get along with.

APPENDIX D

Dependent Measures

General Self-Efficacy Scale

Self-Efficacy

Instructions:

For each statement listed below, indicate to what degree, on the fourteen point scale, you agree or disagree with the statement as a reflection of how you feel about yourself.

Strongly Agree

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Strongly Disagree

- _____ 1. When I make plans, I am certain I can make them work.
- _____ 2. One of my problems is that I cannot get down to work when I should.
- _____ 3. If I can't do a job the first time, I keep trying until I can.
- _____ 4. When I set important goals for myself, I rarely achieve them.
- _____ 5. I give up on things before completing them.
- _____ 6. I avoid facing difficulties.
- _____ 7. If something looks too complicated, I will not even bother to try it.
- _____ 8. When I have something unpleasant to do, I stick to it until I finish it.
- _____ 9. When I decide to do something, I go right to work on it.
- _____ 10. When trying to learn something new, I soon give up if I am not initially successful.
- _____ 11. When unexpected problems occur, I don't handle them well.
- _____ 12. I avoid trying to learn new things when they look too difficult for me.
- _____ 13. Failure just makes me try harder.
- _____ 14. I feel insecure about my ability to do things.
- _____ 15. I am a self-reliant person.
- _____ 16. I give up easily.
- _____ 17. I do not seem capable of dealing with most problems that come up in life.

APPENDIX E

**Revised form of Checklist
Factor Analysis and Reliability**

Revised Coping Checklist

Coping was assessed with a revised version of the Ways of coping Checklist (Folkman & Lazarus, 1980). The revised instrument (Lazarus & Folkman, 1984) contains 67 items on a 4-point scale. Subjects were asked to write out the most stressful work event occurring within the past two weeks and to read each item on the checklist and then indicate to what extent they used it in the situation just described.

Factor Structure

The 67-item checklist was administered to 192 working women aged 18 to 61 ($M=35.4$, $SD=9.7$). Forty percent of the sample were married, 34% were single and 18% were divorced or separated. Twenty-two percent of the women had a high school education, 22% from 1 to 3 years of college, 45% a university degree and 11% professional degrees (MA, PhD). See Appendix F for a description of occupations and professions.

The items were analyzed using a principal components factor analysis calling for two factors (theorized as P-focused and E-focused) using varimax rotation. Fifteen items loaded highly on each of the two factors. The other 28 items were eliminated because they (a) lacked conceptual coherence, (b) loaded below .40, or (c) loaded on both factors.

The thirty items which made up the final checklist was subjected to another factor analysis and accounted for 29% of the total variance. Item-analysis supported the above factor structure and indicated strong internal consistency within each scale (Cronbach's alphas equal $r = .81$ for both).

Coping Scales (Revised 30 Items)

P-Focused	Factor Loading	E-Focused	Factor Loading
10 Tried not to burn my bridges, but leave things somewhat open.	.46	9 Criticized or lectured myself.	.48
20 I was inspired to do something creative.	.51	11 Hoped a miracle would happen.	.47
23 Changed or grew as a person in a good way.	.56	12 Went along with fate, sometimes I just have bad luck.	.48
26 I made a plan of action and followed it.	.51	21 Tried to forget the whole thing.	.42
30 I came out of the experience better than I went in.	.60	24 I waited to see what would happen before doing anything.	.47
31 Talked to someone who could do something concrete about the problem.	.53	29 Realized I brought on the problem myself.	.48
34 Took a big chance or did something very risky.	.41	33 Tried to make myself feel better by eating, smoking, using drugs or medication etc.	.56
35 I tried not to act too hastily or follow my first hunch.	.46	40 Avoided being with people in general.	.53
39 Changed something so things would turn out all right.	.65	43 Kept others from knowing how bad things were.	.43
46 Stood my ground and fought for what I wanted.	.61	47 Took it out on other people.	.50
49 I knew what had to be done, so I doubled my efforts to make things work out.	.45	51 I made a promise to myself that things would be different next time.	.54
52 Came up with a couple of different solutions to the problem.	.70	55 Wished that I could change what had happened or how I	.55
56 I changed something	.48	57 I daydreamed or I was in.	.62
63 I thought about how a person I admire would handle this situation and used that as a model.	.40	58 Wished that the situation would go away.	.60
64 I tried to see things from the other person's point of view.	.50	59 Had fantasies or wishes about how things might turn out.	.72

APPENDIX F

Ancillary Measures (pre/post/follow-up)

7-Day Recall

Occupations

Homework Sheets

Expectancy Questionnaire

EXERCISE HISTORY 7-DAY RECALL

Please record your pattern of physical activity over the past week. It is easier if you work backwards from today's date. If you don't know exactly how long you exercised, estimate as well as you can. Refer to the chart below to estimate intensity (Borg Scale).

Day	Activity (describe)	Duration in Minutes	Intensity**
Monday			
Tuesday			
Wednesday			
Thursday			
Friday			
Saturday			
Sunday			

**Borg Scale

To rate the intensity of activity, you are to rate your feelings which are caused by the work and not the work itself. These feelings should be general, that is about the body as a whole. We are not asking you to specify the feeling, but to select a number which most accurately corresponds to your perception of your total body feeling. Keep in mind that there are no right or wrong numbers. Use any number you think is appropriate:

- 6
- 7 Very, very light
- 8
- 9 Very light
- 10
- 11 Fairly light
- 12
- 13 Somewhat hard
- 14
- 15 Hard
- 16
- 17 Very hard
- 18
- 19 Very, very hard

OCCUPATIONS --- PROFESSIONS (N = 92)

Secretary
Book Keeper
Nurse
Teacher
Counsellor
Student
Librarian
Computer Consultant
Computer Programmer
Sales
Manager
Administrater
Director
Telecommunications
Waitress
Flight Attendent
Self Employed
Baby Sitter
Instructors
Travel Agent
Professor

WITH REGARD TO COPING WITH STRESS: (POST ONLY)

5. In what ways, if any do you feel differently (i.e., emotionally) than you did before this workshop started? See next page for question 5, 6 and 7.
6. In what ways do you behave differently (i.e., what you do) than you did before this workshop started?
7. In what ways do you think differently (i.e., understandings) than you did before this workshop started?
8. To what degree have you been successful with your relaxation/jogging goals.

					GOAL 1		GOAL 2		GOAL 3	
					EX	REL	EX	REL	EX	REL
1	2	3	4	5						
unsuccessful		moderately		very	4	16	12	16	4	32
					23	20	19	24	27	20
(1 subject did not list 3 goals)					19	36	31	32	15	16
					39	12	34	12	42	16
					15	16	4	16	12	4

9. To what degree, if at all, were the following aspects of this program helpful to you in learning to cope with stress? (circle the answer)

(a) support and encouragement of the group

EX. $\bar{M}$ = 3.7

1 2 3 4 5
not at all somewhat very

REL. $\bar{M}$ = 3.0

(b) the actual (jog/relax) activity

EX. $\bar{M}$ = 4.0

1 2 3 4 5
not at all somewhat very

REL. $\bar{M}$ = 3.9

(c) discussions after the activity

EX. $\bar{M}$ = 3.5

1 2 3 4 5
not at all somewhat very

REL. $\bar{M}$ = 2.9

(d) increased knowledge of stress

EX. $\bar{M}$ = 3.6

1 2 3 4 5
not at all somewhat very

REL. $\bar{M}$ = 3.7

(e) encouragement from the leaders

EX. $\bar{M}$ = 4.1

1 2 3 4 5
not at all somewhat very

REL. $\bar{M}$ = 3.8

(POST ONLY) Listed below are responses listed most often.

5. In what ways, if any do you feel differently (i.e., emotionally) than you did before this workshop started?

Exercise

I feel I can control stress.
I feel happier.
I feel more relaxed.
I feel more motivated.
I feel less serious.

Relaxation

I feel more relaxed.
I appear less tense.
I feel more in control.
I feel more confident.
I am somewhat happier.

6. In what ways do you behave differently (i.e., what you do) than you did before this workshop started?

Exercise

I recognize stressful situations sooner.
I exercise regularly.
Under stress I am calmer.
I think before reacting.
I see more alternatives to problems.
I am more motivated.
I smile and laugh more.

Relaxation

I am more assertive in personal situations.
I take time for myself.
I don't react as negatively.
I'm only doing work that interests me.
I use muscle tension relaxation techniques.

7. In what ways do you think differently (i.e., understanding) than you did before this workshop started?

Exercise

I understand my own stress "triggers".
I am not so quick to react.
I am more conscious about relaxing.

I have more control.
I realize the importance of exercise.
I recognize emotional well-being is important.

Relaxation

I don't care about my employers harrassment techniques.
I am more aware of tension.
I have established priorities--what must be done--what I am
Understand more about my own stress.

POST AND FOLLOW-UP QUESTIONNAIRE

INSTRUCTIONS: Read the questions carefully and circle the appropriate answer.

	Post %		Follow-up %	
	EX.	REL.	EX.	REL.
1. In general, to what degree do you successfully cope with stress in NONWORK situations?	0	0	0	4
	4	4	4	8
	39	56	52	52
	42	32	26	28
	15	8	18	8

1 2 3 4 5
not at all somewhat very well

2. In general, to what degree do you successfully cope with stress in WORK situations?	0	0	0	4
	23	12	12	4
	23	44	38	48
	42	32	50	32
	12	12	0	12

1 2 3 4 5
not at all somewhat very well

3. To what extent is jogging/relaxation helping you deal with stress?

(POST ONLY)

4	8
15	16
35	48
42	20
4	8

1 2 3 4 5
not at all somewhat very well

4. To what extent do you use the following elements of relaxation/jogging to relieve stress?

RELAXATION/JOGGING AS:

(a) a distractor

1 2 3 4 5
never somewhat often

	Post %		Follow-up %	
	EX.	REL.	EX.	REL.
(a) a distractor	15	16	20	17
	19	12	13	20
	27	36	20	38
	27	24	25	17
	12	12	17	17

(b) a sense of control

1 2 3 4 5
never somewhat often

(b) a sense of control	12	8	17	8
	19	44	21	29
	12	28	21	33
	42	16	29	29
	15	4	13	0

(c) mood change from negative to positive

1 2 3 4 5
never somewhat often

(c) mood change from negative to positive	4	8	8	13
	8	28	4	17
	23	28	33	46
	39	24	29	25
	27	12	25	0

(d) a tension release

1 2 3 4 5
never somewhat often

(d) a tension release	4	8	0	8
	0	20	8	4
	27	32	25	17
	39	40	38	54
	31	0	29	17

(e) a feeling of well-being

1 2 3 4 5
never somewhat often

(e) a feeling of well-being	0	4	0	4
	8	12	0	35
	15	28	19	26
	42	36	42	34
	35	20	27	0

(FOLLOW-UP ONLY)

5. Did any major stresses occur during the past two months? _____ YES 46 32
NO 50 68
6. Did you seek any additional help for stress during the past two months? (check)
(Subjects indicated more than 1 response)
Medical (family physician) _____	27	24
Counselling _____	4	8
Exercise Training _____	23	8
Self-help (i.e., books) _____	0	4
Stress workshops _____	0	4
Relaxation training _____	0	20
Other _____	16	12
None _____	56	44
7. What has gotten in the way of maintaining your jogging/relaxation program?
(Subjects indicated more than 1 response)
work schedule _____	54	40
procrastination _____	28	40
personal motivation _____	20	56
illness _____	28	16
weather _____	50	0
injury _____	28	0
holiday _____	12	0
laziness _____	36	0
other _____	0	40
9. Have you changed jobs during the past two months?
YES	12	8
NO	88	92
10. To what extent have you maintained your jogging/relaxation program? EX. $\bar{M}$ = 3.04
1	2	3	4	5	REL. $\bar{M}$ = 2.20
not at all		somewhat		very much so	

*Exercise Question Only:

8. To what do you contribute maintenance of exercise?
(Subjects indicated more than 1 response)
spouse/partner support _____	28
social experience _____	20
established pattern of exercise _____	50
feeling good _____	54
health _____	46
other _____	24

HOMEWORK CHARTS

The average number of practise sessions per week.	EX.	REL.
	3	3

The length of practise sessions.	EX.	REL.
Mean (minutes)	25	15
Range	15-60	10-40

Feelings before exercise/relaxation.

tense	geared up
tired	annoyed
calm	up tight
lazy	energetic
hyper	rushed
ok	good

Feelings after.

relaxed	energetic
tired	good
great	exhausted
exhilerated	better
refreshed	warm
calm	less tense

Ratings of perceived exertion for EXERCISE.

Borg scale Range-- (6-20)
Mean--- (13)

Ratings of perceived anxiety for RELAXATION.

Anxiety scale Range-- (1-100)
Mean--- (25)

See next page for descriptions of the Borg scale and the Anxiety scale.

WEEKLY RELAXATION CHART

DAY FEELING BEFORE LENGTH (min.) RATING OF ANXIETY FEELING AFTER

1 Absolutely Calm

ANXIETY RATING SCALE

Think of the worst anxiety you have ever experienced or can imagine experiencing, and assign to this the number 100. Now think of the state of being absolutely calm and call this zero. Now you have a scale of anxiety. On this scale, how do you rate yourself at this moment?

100 Highest Anxiety

WEEKLY EXERCISE CHART

DAY	FEELING BEFORE	LENGTH OF JOG/WALK (min.) * RPE	FEELING AFTER

- 6
- 7 very, very light
- 8
- 9 very light
- 10
- 11 fairly light
- 12
- 13 somewhat hard
- 14
- 15 hard
- 16
- 17 very hard
- 18
- 19 very very hard
- 20

BORG SCALE

To rate the intensity of activity, you are to rate your feelings which are caused by the work and not the work itself. These feelings should be general, that is about the body as a whole. We are not asking you to specify the feeling, but to select a number which most accurately corresponds to your total body feeling. Keep in mind that there are no right or wrong answers. Use any number you think is appropriate.

Witness

*RPE Rate of Perceived Exertion (Borg Scale)

EXPECTANCY QUESTIONNAIRE

1. "How confident are you that this program will be successful in reducing your stress reactions?"

0 1 2 3 4 5 6

Not at all

Very much so

2. "How logical does this type of program seem to you as a stress management technique?"

0 1 2 3 4 5 6

Not at all

Very much so

3. "How confident are you in recommending the program to a friend who is extremely anxious?"

0 1 2 3 4 5 6

Not at all

Very much so

1. How confident are you that that this program has been successful in reducing your stress reactions?

$\frac{1}{\text{not at all}}$
 $\frac{2}{}$
 $\frac{3}{}$
 $\frac{4}{}$
 $\frac{5}{}$
 $\frac{6}{}$
 $\frac{7}{\text{very much so}}$

2. How logical does this type of program seem to you as a stress-management technique?

$\frac{1}{\text{not at all}}$
 $\frac{2}{}$
 $\frac{3}{}$
 $\frac{4}{}$
 $\frac{5}{}$
 $\frac{6}{}$
 $\frac{7}{\text{very much so}}$

3. How confident are you in recommending the program to a friend who is extremely anxious?

$\frac{1}{\text{not at all}}$
 $\frac{2}{}$
 $\frac{3}{}$
 $\frac{4}{}$
 $\frac{5}{}$
 $\frac{6}{}$
 $\frac{7}{\text{very much so}}$