The Effects of Prescriptive Exercise on Coronary-Prone Behavior Patterns and Depression

by

Judy Colligan, R.N., B.S.N., P.M.H.N.P.

A Clinical Investigation

Presented to

The Oregon Health Sciences University

School of Nursing

in partial fulfillment

of the requirements for the degree of

Master of Nursing

June, 1984

APPROVED:

[redacted]

Charlotte Markel, R.N., M.S.M., Clinical Investigation Advisor

[redacted]

Tim Carmody, Ph.D., First Reader

[redacted]

Jo Horsley, R.N., Ph.D., Second Reader

[redacted]

Carol A. Lindeman, R.N., Ph.D., Dean, School of Nursing

This study was supported
by traineeships from the United
States Public Health Service Grants
Numbers 1 ALL NU00 250-01
and 5 ALL NU00 250-02

ACKNOWLEDGEMENTS

I would like to thank Charlotte Markel for her support and encouragement over the past year. Her assistance in the shaping of the concepts which guide this study were invaluable. Her patience with my struggle to translate ideas into writing was always appreciated.

I would also like to thank Tim Carmody for sharing his clinical expertise, for his many helpful suggestions, and for his delightful sense of humor. My appreciation to Jo Horsley for her editorial suggestions which influenced and improved the quality of this study.

Finally, I wish to thank my friends and family for their constant support of my efforts to grow in both my personal and professional life.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

Introduction

Coronary heart disease is the leading cause of premature death and the number one crippling agent among people below the age of sixty-five in the United States (Lynch, 1977). The disease is a major assault to a person's physical health, emotional well-being, employment status, family role, and future.

A major focus of rehabilitation for persons suffering coronary heart disease has been the introduction of prescriptive exercise programs. The physiological benefits of exercise in reducing complications associated with coronary heart disease have been well documented. The psychological benefits of exercise have not been as clear. This is in part complicated by the array of psychological parameters used to identify and evaluate the relationship of physical states to psychological well-being.

One of the most often observed psychological problems that affects individuals who have coronary heart disease is depression (Hackett & Casson, 1973). Depression can be defined as mild fluctuations in mood to a severe and disabling illness (Secunda, Katz, Friedman, & Schnyler, 1973). Different theoretical constructs and antecedents have been used to describe depression and its development. For the purpose of this investigation, a learned helplessness model of depression has been used to explore the relationship of depression to coronary heart disease. The concept of learned helplessness provides a framework to explain the relationship between one's beliefs and consequent behaviors which may influence physical health. In the learned helplessness model, the

ability to have some control over life situations and the attribution of causality to lack of control over life situations has received considerable attention as influencing the process of depression (Abramson, Seligman, & Teasdale, 1978; Seligman, Abramson, Semmel, & von Baeyer, 1979; Harvey, 1981).

The issues of control and helplessness in life events may have important consequences in the initiation, exacerbation, and maintenance of coronary heart disease. For the Type A coronary-prone individual (a behavior pattern characterized by competitive striving, time urgency, aggressiveness and hostility), the state of helplessness has been proposed as a precurser to physical disease and an antecedent of coronary disease (Krantz, Glass, & Snyder, 1974). The concept of coronary-prone behavior patterns has been discussed at length in the literature and is used in this investigation to identify those individuals whose behavioral responses have led to heart disease.

The psychological correlates of stress of life events and illness have only recently received attention. Given that coronary heart disease represents a significant health problem, careful investigation of psychological conceptual constructs in relation to this disease is warranted. Persons with coronary heart disease and the related Type A coronary-prone behavior patterns may be vulnerable to disease specific patterns of behavior in the face of uncontrollable life events.

It was the intent of this study to identify the parameters of depression in the coronary heart diseased individual and identify the parameters that might have altered with the intervention of prescriptive exercise.

Review of the Literature and Conceptual Framework

The review of the literature to follow has been organized into five sections. The first section reviews the physiological benefits of exercise and the psychological values associated with physical fitness. The second section orients the reader to the concepts of depression with emphasis on the learned helplessness (reactive) model. The third section reviews the concept of coronary-prone behavior patterns. The fourth section explores the stress of life events. Last, is the conceptual framework upon which this investigation is based.

Exercise

Physiological Benefits of Exercise

The concept of a person's physical fitness defines the person's ability to produce energy, express strength and movement, and defines the opportunities and limitations of roles one chooses in life. The body's physical resources strongly influence our work and play activities (Atony, 1980).

The physiological studies of exercise and health maintenance have produced considerable data to support positive consequences of maintaining physical health. Exercise reduces the incidence of coronary artery disease, obesity, hypertension, elevated lipids, risks from smoking and diabetes, and appears to increase longevity by reduction of risk to life threatening disease (Griest, Klein, Eischens, Faris, Gurman, Morgan, 1979; Payne, 1979).

Historically, physical activity for coronary heart disease patients was initiated in the early 1940's. Frequent postural changes and early participation in self-care activities were advocated to avoid complications of phlebothrombosis, embolization, congestive heart

failure, and "cardiac neurotics" which were associated with extended bed rest and prolonged restriction. In the fifties, the prescribed activity was "armchair treatment," the change from supine position to sitting in a chair resulted in significant reduction in cardiac output for the patient. More recently, it has been demonstrated that selected passive and active exercise can be initiated in the coronary care unit without significant increases in work of the heart. Supervised programs of higher intensity physical activity for cardiac patients have been utilized in the last decade with the purpose of improving physical working capacity; decreasing signs and symptoms of ischemic heart disease at rest and during exertion; facilitating return to gainful employment; and reducing the incidence of reinfarction or sudden death (Haskell, 1974).

The measurement of physical fitness used to assess fine and gross motor skills, body coordination, strength and agility, endurance, and physiological changes measured by laboratory readings. The measurement of physical fitness varies with studies and complicates the correlation of data between studies (Howell & Alderman, 1967).

The physiological effects of exercise, through the use of cardiac catheterization and hemodynamic testing are now fairly well recognized and understood (Erberle, 1978). A complete review of physiological changes is beyond the scope of this paper. However, an overview of coronary-prone behavior patterns and traditional risk factors is mentioned to emphasize the relationship between behavior and cardiovascular pathology.

According to Glass (1977), coronary-prone behavior patterns and cardiac pathology are associated. These associations are not spurious

or secondary to other risk factors. Coronary-prone behavior patterns occur on a continuum from pattern (Type A) to pattern (Type B). Type A's are characterized by restless striving, time urgency, aggressiveness and hostility. There is some speculation that Type A behavior increases the risk of coronary heart disease in part through association with the atherosclerotic process. Other findings associating Type A with risk factors of coronary heart disease are as follows: serum cholesterol levels are significantly higher in pattern A's when compared to pattern B's; pattern A's may react to frustration with greater blood pressure elevation than B's; amount of cigarettes smoked per day is greater in A's than B's; and plasma levels of norepinephrine levels were enhanced in A's in response to stressful stimulations and excreted in urine at higher levels.

Not all studies report a significant positive effect of physical training on mortality or reinfarction rate. In controlled trials of physical exercise post myocardial infarction, by Wilhelmsen, Sanne, Emfeldt, Grimby, Tibblin, and Wedel (1975), it was noted that the high drop out rate of both cardiac subjects and healthy volunteers made it difficult to know what form and intensity the prescriptive exercise program should have to achieve secondary preventive effects. In this study the authors believed that antismoking advice and treatment with betablocking drug deserved a higher priority than physical exercise in secondary prevention. The work of Wilhelmsen, et al. (1975), demonstrated a positive relationship between exercise and physiological effects as measured by increased functional capacity and enhanced quality of life.

Psychological Benefits of Exercise

According to Antony (1980), few social psychological theorists gave even passing attention to physical fitness as a dimension of effective functioning of people. Maslow and Freud gave recognition to energy levels and productivity a person demonstrates as a reflection of abstract physical functioning. Cottell and Sheldon gave inference to physiological factors of a "constitutional nature" determining personality functioning. The exception to omission of the physical fitness factor was Carkhuff, who identified physical aptitude as a criteria for emotional and intellectual aptitude.

The incorporation of one's physical fitness as a factor in successful role performance and psychological well-being has been measured using a variety of parameters. The variety has made comparison of studies difficult at best. These parameters include, but are not limited to attitude, self-concept, body concept, personality traits, motivating factors, and mood.

Collingwood and Willett (1971) investigated the effects of physical training on fitness performance, positive body attitude, positive self-attitude, self-acceptance, and one's real versus idealized self. The researchers concluded that the physical training provided both a concrete and successful experience for the subjects and resulted in significant positive changes in the areas of self-concept, self-acceptance, and body attitude. Collingwood (1972) repeated the 1971 study using control groups receiving no fitness training. The results again demonstrated the positive effects of the fitness program. There was a significant between-group effect on the self-concept, self-acceptance, and body attitude scales.

Body concept and perceived physical fitness in relation to self-concept was originally investigated by Secord and Jourand in 1953. They developed a Body Cathexis Scale in which subjects rated satisfaction or dissatisfaction with body parts and functions. This research attempted to go beyond subjective experiences of body image which, according to Zion (1965) report unconscious identification with body. Zion (1965) explored the conscious perception of body and self-concept and concluded that the security feelings a person relates to body concept is significantly correlated to the security a person has in self in relation to environment. This finding is consistent with Leonardson's (1977) study of perceived fitness and self-concept in high school and college students. Leonardson's results pointed to a significant positive correlation between both variables.

The relationship of physical fitness and personality has presented a cause and effect problem for researchers studying the "very fit" or athletes. Does personality cause a direct effect on physical condition or does physical condition have a direct causal effect on personality? Studies of athletes or the very physically fit, the findings of Ismail and Trachtman (1973), indicated that their subjects demonstrated more leadership qualities, sociability, self-confidence, intellectual efficiency, greater emotional stability and self-assuredness than the inactive non-athlete. Whether or not these personality factors are produced by the acutely competitive sports environment or are intrinsic to the individual and allow the athlete to survive remains unclear. Ogilive and Turko (1971) maintain that athletic competition is no more beneficial to building character than other intense pursuits. Their studies of athletes did conclude that in sports as in other endeavors,

the survivors have stronger personalities, greater emotional maturity and better control.

The majority of people do not fit into the category of an athlete. Studies of the "ordinary person," therefore, and the relationship between his or her personality and physical fitness is much more appropriate for application to client population.

Ismail and Trachtman (1973) studied a group of middle-aged men who participated in a regular physical fitness program for four months. The results indicated that the subjects became more self-sufficient, emotionally stable and imaginative. This research corroborates the earlier findings of Tillman (1965). The 1965 study indicated that the physically fit were more extroverted, more socially oriented, and more interested in people and group interaction than those with low physical fitness.

These studies do seem to indicate that out-of-condition normal subjects show more psychological distress than conditioned subjects, and that out-of-condition subjects approach the conditioned subjects' higher level of functioning in post tests as a result of progressive physical exercise. The stability of personality changes of persons who have initiated and maintained a regular exercise program remains to be evaluated in long-term longitudinal reviews.

In a 1969 review of literature on physical fitness and emotional health, William Morgan reported that in studies as early as 1934 there appeared to be a relationship between an individual's strength and endurance and the presence of mental illness (non-psychotic and psychotic). The studies in general appeared to indicate that psychotic (schizophrenic) groups had significantly lower levels of fitness than

non-psychotic groups, and that depressed groups had less endurance and physical working capacity than non-depressed. Morgan points out that although these early studies have several inherent weaknesses (contamination factor of pharmacologic therapy, inadequate statistical controls, and inadequate physical assessment measurements), they provided important information for the rationale of developing "prescriptive exercise programs."

Morgan conducted studies (1969; 1969; 1970) which demonstrated a "suggestion" of a relationship between physical working capacity and the degree of psychopathology. This relationship appeared to be evident in males and not significant in depressed females. The relationship of degree of change noted in mood states compared with differing amounts of aerobic activity in subjects was explored by Wilson, Morey, and Bird (1980). Their study concluded that joggers reported better mood states (less depression) than the non-exercisers and the marathon runners reported even more positive mood states than joggers. Both the Morgan (1969; 1969; 1970) and Wilson, et al. (1980) studies seem to indicate that degree of exercise and physical working capacity influence the intensity of mood.

Morgan, Roberts, and Brand (1970) and Morgan, Roberts, and Flinerman (1971) investigated psychological effects of both chronic and acute physical activity in adult males. The results from both studies demonstrated that exercise did not significantly reduce depression scales in the group as a whole. However, the subjects who tested out as depressed at the outset of the chronic physical activity study had post-test results which demonstrated a statistically significant ($p \leq .01$) decrease in depression profiles. It is interesting to note

that another phenomenon observed by the researchers was a subjective report by subjects that they would feel better following physical activity. This "feeling better" sensation has frequently been observed by other researchers (Brunner, 1969; Mann, Garrett, Fahi, Murry, Billing, 1969; Kostrubala, 1976). Unfortunately to date this subjectively reported experience has not been adequately evaluated by psychometric devices.

Greist, et al. (1979) evaluated outcomes of three groups of subjects comparing running and time-limited and time-unlimited psychotherapy. Running as a treatment for moderate depression was at least as effective in alleviation of depression symptoms as the psychotherapy modalities.

The utilization of "prescriptive exercise programs" has gained most of its popularity not in the field of mental health but in cardiac rehabilitation. Naughton, Bruhn, and Lategota (1968) in an early study of psychological effects of exercise training administered the Taylor Manifest Anxiety Scale and MMPI to subjects pre- and post-exercise training. The results indicated that there were no differences in pre- and post-testing. Subjects, however, did report an increase in self-confidence.

Hellerstein (1968) in an investigation of cardiac subjects reported a decrease in depression scores after prescriptive exercise which was significant at the one percent level. The degree of change in depression scales was observed to vary directly with disease severity. The Hellerstein investigation used the MMPI depression scale as the measure of affect or mood change. The prescriptive exercise program consisted of calesthenics for strength, run-walk sequences for endurance, and

recreational exercise. Exercise began gradually and was increased throughout the program.

Blumenthal, Williams, Williams, and Wallace (1980) studied the effects of exercise on coronary-prone behavior patterns and found a significant reduction in the coronary risk profiles of healthy, middle-age subjects. The ages of subjects ranged from 26 to 61 years with a mean age of 42.6 years, and included both males and females. The physical exercise training program consisted of 10 weeks of physical conditioning. This was not a "personality change" or shift from Type A to Type B behavior, but rather a reduction in magnitude of the Type A behavior pattern. This study did not address or measure change in learned helplessness as part of Type A behavior.

Krantz, Glass, and Snyder (1974) completed experiments to examine the relationship between stress levels and learned helplessness in coronary-prone behaviors. According to Krantz, et al. (1974) it is not unreasonable to assume that helplessness may be an antecedent of coronary disease. In a study of 60 male students, escape-no escape test treatments were administered to induce feelings of helplessness. The results indicated that as the intensity of stressors increased, Type A's rate themselves as more helpless and increase their attempts to attain control when compared to Type B's. The results indicated a link between reactions to uncontrollable stress and coronary-prone behavior patterns. The authors acknowledge this relationship is complex and individual differences may play an important part in the process.

Both the Blumenthal, et al. (1980) and Krantz, et al. (1974) studies used normal healthy college students as subjects. The effects of exercise, uncontrollable stress, and coronary heart diseased persons

merits further consideration.

The psychological effects of physical exercise has shown mixed results in the literature due to the variety in populations and measurements used for evaluation. Nursing interventions, therefore, need to consider the client population and response patterns unique to specific diseases when planning for positive outcomes.

Conceptual Models of Depression

The divergent concepts or models of depression arise from differences in origin (antecedents). Akiskal and McKinney (1973) present the major conceptual models of depression as 1) the "aggression-turned-inward" model, 2) the "object-loss" model, 3) the "reinforcement" model, and 4) the "biogenic amine" model.

The "aggression-turned-inward" model, a psychoanalytic concept originally proposed by Abraham, views symptoms of depression in terms of gratification or discharge of needs or drives. This theory, expanded by Freud, also places emphasis on defenses against these drives. The psychoanalytic framework identifies depression as hostility (anger) turned inward because of the loss of an ambivalently loved person (Akiskal & McKinney, 1973). The important task of psychodynamic theory, according to Chodoff (1970) is to provide an accurate description of the interpersonal past and present transactions which affect the individual. The criticism of the psychoanalytic model is that it is deficient in data which can be scientifically verified (Chodoff, 1970; Beck & Shaw, 1977; Akiskal & McKinney, 1973).

The "object loss" model has its origins in the psychoanalytic model in that this model defines depression as the reaction to a lost love object. Although the loss may be symbolic, such as loss of status

or self-esteem, it generally refers to the disruption of an attachment bond to a loved person (Akiskal & McKinney, 1973). An example of "object loss" in infants is described by Spitz as anaclitic depression. This syndrome describes severe psychological damage due to the removal of a mother in infancy or with infants reared in institutional homes with minimal human contact (Seligman, 1975).

The "reinforcement" model identifies depression as a set of behaviors which result from loss of reinforcement sources, and the gain of attention and sympathy as operant conditioners. The individual views himself as helpless and finds some relief in secondary gains from being helpless (Akiskai & McKinney, 1973). The "reinforcement" model incorporates behavioral principles but is not a strict behavioral concept.

The "biogenic amine" model is based on the biochemical considerations influencing depression. Antidepressant medications were developed in the 1950's and are generally divided into tricyclic antidepressants and monoamine oxidase inhibitors. The more commonly used tricyclios are hypothesized to work by inhibiting the reuptake of biogenic amines in the body. In a recent review of literature which summarized only random-assignment, double blind studies, tricyclics were found to be more effective than the placebo in two-thirds of the treatment groups studied. One interpretation of results indicate that antidepressants are not as effective in treating heterogeneous populations of depressed people, but rather for endogenous depressions. This interpretation, which corresponds with clinical observations, emphasizes the need to consider the differences in depressive illness (Barchas, Berger, & Ciaranello, 1977).

The four conceptual models of depression are not mutually exclusive and have interrelated principles. The holistic concept of depression presented by Akiskel and McKinney (1975) identifies that in clinical practice depression can be understood as a final common pathway of various processes which include genetic factors, developmental events, physiological stressers, and psychosocially defined acute or chronic stress. The authors acknowledge that severe, debilitating cardiac, rheumatological, and other chronic diseases could serve as sufficient causes for depression.

In this investigation, the reinforcement or learned helplessness model is the conceptual model of depression that will be utilized. The "reinforcement" model of depression incorporates qualities of depression which are common in the phenomenon of learned helplessness. According to Miller, Rosellini, and Seligman (1977), the concept of learned helplessness can provide a framework for understanding reactive depression, characterized by causes that are external (exogenous) rather than internal (endogenous). The learned helplessness theory of depression was introduced by Seligman in 1975. It is the psychological state that frequently occurs in animals and humans when events are uncontrollable.

In human subjects, learned helplessness attempts to explain the relationship between what one believes about the cause of events and the effect of that belief on how one behaves in future events. Two conditions must exist before helplessness develops. The first is exposure to uncontrollable events and the second is a belief that nothing can be done to change those events (Murphy, 1982).

The cornerstone of the helplessness hypothesis is that learning

that outcomes are uncontrollable will result in three motivational deficits. The first motivational deficit refers to a retarded initiation of voluntary responses. This is a consequence of the expectation that outcomes are uncontrollable. The cognitive deficit postulates that the individual comes to expect that outcomes are uncontrollable and therefore subsequent learning that outcomes may be controllable is more difficult. Finally, as a result of learning that outcomes are uncontrollable, a person demonstrates depressed affect (Abramson, Seligman, & Teasdale, 1978).

The early hypothesis of learned helplessness was formulated prior to studies with human subjects. Abramson, et al. (1978) reformulated the earlier theory to attend to the causal attribution a person makes when confronted with uncontrollable events. In this attributional framework, the type and degree of learned helplessness experienced will then vary according to the meaning assigned the uncontrollable events. Causal attributions are classified in three dimensions of helplessness. These include personal vs. universal, stable vs. unstable, and global vs. specific. As summerized by Murphy (1982), "the attribution predicts the recurrence of the expectations, but the expectations determine the occurance of the performance deficit."

According to Abramson, et al. (1978), at least three factors determine the intensity of the emotional impact of depression. First, depressed affect intensity increases as the individual's desire for the unobtainable increases. Second, depressed affect increases as the aversiveness of the unavoidable outcome increases. Lastly, as expectations of uncontrollability increase, so does depressed affect.

The helplessness model of depression has several parallels with

other theoretical perspectives. The helplessness theory (Abramson, et al., 1978) identifies affective changes as a result of the expectation of bad outcomes that are both personal and universal. Lowered self-esteem has been observed as a hallmark of depression by Beck (1967). The helplessness hypothesis suggests that depressed persons show lower self-esteem if they believe their helplessness is personal rather than universal. The Beck theory postulates that depressed individuals have a greater tendency to place attribution of negative events to more controllable causes and attribution of positive events to uncontrollable causes, which is consistent with Abramson, et al.'s (1978) reformulated model of learned helplessness (Harvey, 1981).

In studies examining attributional patterns in depressed and non-depressed college students (Seligman, Abramson, Semmel, & von Baeyer, 1979; Harvey, 1981), the depressed students attributed bad outcomes to internal causes of lack of control. The Seligman et al. (1979) study identified bad outcome predictions to stable and global attributions as well. Harvey's (1981) results indicated attribution of negative events to controllable causes and was consistent with Beck's (1967) model of depression. Both studies were designed for college students. The application of attributional causalty testing for older and disease specific population has not been developed.

Depue and Monroe (1978), in a review of the reformulation of the learned helplessness hypothesis, identified a need for future research which would provide extensions of the model. The authors state that in keeping with the multi-factorial nature of etiologies of clinical illness, learned helplessness is not adequate as the sole etiological factor in clinical depression. Other factors which need to be con-

sidered in studying depression include biochemical factors, familial propensity, concurrent medical disorders, and sensitivity of the ratings used by the investigator (Depue & Monroe, 1978).

The inclusion of patient perceptions as a factor in assessment cannot be overlooked. Arthur Schmale (1982) reported that in his studies of both cardiac and cancer patients, the straight-forward method of asking the individual to anticipate outcome or adaptation proved to be as important a preditor of coping ability as the laborious attempts to build a scientific instrument to assess outcome.

Coronary-Prone Behavior Patterns

Several researchers (Glass & Singer, 1972; Seligman 1975; Glass, 1977) have shown that behavioral response to an aversive stimuli is dependent on the individual's past experiences of success or failure to control his/her environment. As stated previously, learned helplessness is part of the behavioral response pattern. Persons with coronary heart disease have been found to demonstrate a past history of behavioral expectations which influence how trauma (stress) is managed. The entire range of responses is referred to as the concept of "coronary-prone behavioral patterns" and has been discussed in the literature for many years. Work overload, aggressive striving for achievement, difficulty in relaxing, and the need to maintain rapid pacing of activities are characteristic of coronary-prone persons (Dreyfurs, Shannon & Sharon, 1966; Liljefurs & Ruhe, 1970; Theorell & Ruhe, 1971; Glass, 1975).

"Sisyphus pattern" is another term coined by Wolf (1969) to characterize the coronary-prone person. It is described as a striving without joy, frequently without success, and experiences little sense

of accomplishment or satisfaction. The common features of the Glass and Wolf coronary-prone patterns are in joyless striving.

Glass (1977) emphasizes that the "coronary-prone behavior pattern" is a set of overt behaviors resulting from the interaction of specific predispositions with appropriately eliciting situations. It does not imply that "personality traits" lead to behavioral and psychological response by some invariant method.

The description of coronary-prone behavior patterns as described by Friedman and Rosenman from several laboratory studies (Glass, 1977) is a "characteristic action - emotional complex which is exhibited by those individuals who are engaged in a relatively chronic struggle to obtain unlimited numbers of poorly defined things in their environment in the shortest period of time and, if necessary, against the opposing effects of other things or persons in this same environment" (Friedman, 1969, p. 84). Glass (1977) defines persons who exhibit this behavior as Pattern A (Type A) individuals. The descriptive characteristics include 1) competitive achievement striving, 2) exaggerated sense of time urgency, and 3) aggressiveness and hostility. At the opposite end of the "A" behavior pattern individuals are Pattern B (Type B) individuals. Type "B's" characteristics include 1) little evidence of chronic time urgency, 2) a sense of serenity and unhurried movements, 3) less easily aroused anger responses, and 4) a recognition of limitations with no intense inclination to compete (Glass, 1977). The description of Type A and Type B individuals represent the opposite extremes of a bipolar continuum. In clinical practice the designation of individuals as Type A or Type B occurs along that continuum with shared characteristics. The designation of Type A depends on the

intensity and amount of characteristics of A behaviors a person demonstrates (Jenkins, 1969).

According to Glass (1977) Type A individuals exert more effort than Type B individuals to master stressful events which are perceived as a threat to their sense of control. Initial attempts to control stimuli which is uncontrollable produces a hyper-responsiveness of efforts. When these efforts are without reward they produce frustration and psychological exhaustion. This represents the learned helplessness response and the tendency to give up efforts to cope with the environment. Type A's tend to show greater signs of helplessness than Type B's when faced with uncontrollable life events.

Life Events

Life events, according to B. S. Dohrenwend and B. P. Dohrenwend (1974), are a class of stressful stimuli or situations that everyone is exposed to in the course of one's life. There has been considerable research documenting the association of life events with the onset of illness; the risk of illness; and the seriousness of chronic illness (Masuda & Holmes, 1978).

The initial research on life events was devised by Holmes and Rahe (1967) as a method of quantifying the amount of psychosocial adjustment required to cope with specific life events. From their research was devised the Social Readjustment Rating Scale (SRRS). The forty-three life events selected were gleaned from clinical observations of more than 5,000 patients whose case histories correlated with significant events which preceded illness.

According to Masuda and Holmes (1978), there have been several modifications by researchers of the SRRS. These include, but are not

limited to, additions or deletions of life events items; changes in weighting of particular events; changes in test administration; and category scaling. In spite of changes in using the scale and questions concerning methodology, the basic concept of the relationship of accumulating life change to illness remains intact. Rahe (1979) suggests that this correlation is strongly influenced by the way an individual perceives life events; his/her social support systems; psychological defenses; individual coping mechanisms; and illness behavior characteristics. For most physical illnesses, the etiological mechanism of recent life events appears to be decreased body resistance to those diseases an individual is prone to develop via genetic or environmental predisposition. Rahe (1979) further states that there is a suggestion that the correlation for recent life events and illness symptomatology may be higher in depression than in physical disease.

Just as psychological factors may assume a multidimensional pattern unique to disease, so may life events assume a multidimensional pattern in the event-illness relationship. Dohrenwend (1974) explored the consequences of differences in stressful life events and its relationship to psychiatric disorder and physical illness in general populations. It is Dohrenwend's view that there are several very different event populations. There is a population of events that are confounded with the psychiatric condition of the subject; a population of events consisting of physical illness and injury to the subject; and a population of events whose occurrences are independent of physical health or psychiatric condition.

These general groups can be further distinguished from each other by determining if events were objective or subjective, gain or loss

events, and events for which the subject may or may not be responsible.

Fairbank and Hough (1979), in reviewing life event categories, concluded that if a practitioner is interested in understanding illness the consideration of event categories is essential. Analysis of life events should be direct expressions of the theory being employed. These researchers also felt from their review of life-event illness relationships that interpersonal and personal coping mechanisms were essential to understanding the production of illness. Fairbank and Hough (1979) concluded that the issue of control or lack of control makes a great deal of difference in reviewing events which lead to disease. The authors' review of Theorell's (1976) data seemed to indicate that undesirable events within the subject's control are associated with illness.

Recent life changes with specific regard to coronary heart disease has been addressed in several studies. Rahe, Romo, Bennett, and Siltanun (1974) reported that in a study of over 500 cases of myocardial infarctions or abrupt coronary disease, all but one group of subjects demonstrated marked elevations in magnitude of life changes six months prior to infarct or death. Spouse reports moderately agree with survivors' reports of life change units. In this study, no single area of life change differentiated myocardial infarction survivors from coronary-death victims. Life change units were measured only according to amount of life change and readjustment required for that event. Both the 1974 (Rahe, et al.) investigation and a 1973 study by Rahe, Bennett, Romo, and Siltanun demonstrated that subjects with the most severe coronary crisis reported the highest increases in recent life changes.

Lundberg, Theorell, and Lind (1975) investigated individual life-change scores, adjustment ratings and upsettingness rating. The results indicated that persons with infarctions had higher total life change scores than the control group. The differences between groups were larger for upsettingness to the individual than for adjustment. This study illustrates the significance of attending to personal differences and individual perceptions regarding life change scale score assignment and the onset of disease.

The issue of independent (uncontrollable) versus dependent (controllable) life events presents a complex issue. Connolly (1976), in a review of life events prior to myocardial infarction, found a significantly greater number of patients reported life events occurring three weeks prior to infarct than did the control group (non-patients). Also, independent events were reported by myocardial infarction patients significantly more often than the control group. The concept of independence of events, according to Connolly, is important and needs closer scrutiny. Connolly suggests that it may be that pre-illness behavior is causing both disease and events and that events themselves are irrelevant to the cause.

Events that are independent of control in relationship with pre-illness behavior may represent a more important association for specific illnessness than other subgroups of life events or even global life event changes. The relationship of uncontrollable life events and coronary heart disease was explored by Glass (1977). Glass compared three groups which consisted of a) patients admitted to a coronary care unit; b) patients admitted to a medical or psychiatric ward, and c) a healthy nonhospitalized control group. Three major scores of life

change units were calculated for each group. These included a global life change score; a loss index based on helplessness-inducing life events; and a negative events index of events which did not involve a loss. The results indicated that helplessness-inducing life events are more likely to occur in persons with illness as compared to persons without illness. Also, there was an overall finding which suggested that compared to nonhospitalized controls, coronary patients are Type A's who experience loss one year prior to illness. The design of the Glass (1977) study was limited by the retrospective nature of recall of events and the lack of independent verification by subjects.

Conceptual Framework

The traditional Western approach to viewing the relationship between physiological and psychological variables of disease has been the biomedical model. This scientific model has been based on dualism and reductionism. According to Engel (1982), dualism implies a separation of mind from body and reductionism views disease as a simple cause and effect relationship of discrete liner entities. Engel (1982, p. 15) further states, "the biomedical model lacks the means to conceptualize and approach scientifically the patient as a living organism in dynamic transaction with physical, psychological, and social environments."

The decline of major diseases from exogenous causes has focused attention on the fact that the high prevalence of chronic disorders, such as coronary heart disease, could not be explained alone by the biomedical model of disease. Epidemiological research began to indicate that prevalence of chronic disease varied with the type of setting (environment and life-style) in which the disease occurred. It

appeared that physical and psychosocial factors may well influence the incidence of chronic disease (Dupue, Monroe, & Shackman, 1979).

The "dynamic transaction" of the individual with environment identified by Engel (1982) varies with each individual. Margaret Newman (1979), using a theory of health which is a synthesis of the concepts of health and illness, sees each individual as having a particular patterned response of health. This patterned response exists prior to the manifestation of illness and is integral to the person's life-style. The disease condition becomes a manifestation of the total pattern of the individual, a pattern which may be out of the individual's consious awareness.

The patterned response to stress by individuals and the inability to recognize this general adaptation phenomenon is acknowledged by Wilson (1980). He states that in our hyperstimulated environment the recognition of maladaptive stress patterns becomes very difficult. This is complicated by the fact that the practitioner may be as over-stressed as his/her patients. Each individual, according to Wilson (1980), may develop a predominant pathway of stress as an adaptive mechanism. The four neurophysiologic pathways by which organic pathology develops include interneuronal, neurovascular, neuromuscular, and neurohumeral. See Table 1.

The psychophysiologic pathway by which cardiovascular pathology is produced is a neurovascular stress response. A sympathetic (rather than parasympathetic) overload response to stress, when it becomes protracted vascular stress response, may lead directly to coronary heart disease even when other risk factors are nonexistent. In individuals with multiple risks, the onset of disease is significantly

TABLE 1: SPECTRUM OF CONDITIONED STRESS RESPONSE STEREOTYPE

PARASYMPATHETIC OVERLOAD		DOMINANT PATHWAY	SYMPATHETIC OVERLOAD	
EVENTUAL OUTCOME	NEUROPHYSIOLOGIC MECHANISM	HORMONAL MEDIATORS	NEUROPHYSIOLOGIC MECHANISM	EVENTUAL OUTCOME
weakness myasthenia osteoporosis	muscle tone-flaccidity musculoskeletal wasting	NEUROMUSCULAR acetylocholine acetylcholine esterase	muscle tone-bracing progressive facial and skeletal rigidity from fibrosis	chronic fatigue muscle contraction headaches low back pain discogenic disease degenerative arthritis
fainting postural hypotension aesthenia asystoly	pulse pressure stroke volume splanchnic pooling of blood secondary to vascular dilation B.P. pulse rate	NEUROVASCULAR adrenalin norepinephrine cortisol	pulse pressure, B.P., P muscular vasodilation splanchnic and cutaneous vasoconstruction	migraine, Reynaud's syndrome angina, menstrual cramps atherosclerosis coronary disease, stroke
adrenocortical insufficiency	adrenalin-norepinephrine cortisol	NEUROHUMERAL (endocrine) ACTH	adrenalin, norepinephrine, cortisol results in hypertension from renal vascular constriction renin-angiotension pathway as well as fluid retention	hypertension Cushing's syndrome
myxedema	thyroxin	TSH	thyroxin	thyrotoxicosis
amenorrhea atrophy	suppression of progesterone	FSH-LH GH	suppression of estrogen growth suppression	hypermenorrhea, cramps growth suppression, dwarfism

Wilson (1981)

TABLE 1 (cont.,)

EVENTUAL OUTCOME	NEUROPHYSIOLOGIC MECHANISM	HORMONAL MEDIATORS	NEUROPHYSIOLOGIC MECHANISM	EVENTUAL OUTCOME
obesity diabetes	diabetogenic factors			
infections cancer	suppression of immune response-inability to destroy toxants, bacteria, viruses or mutant cells	cortisol leukopoetin interferon	hyperimmune response leading to inappropriate immune response to allergens-tissues	rheumatic fever collagen disease allergies (hay fever)
irritable bowel syndrome asthma eczema-psoriasis	motility in gut, acid production in stomach bronchospasm-mucous sweatgland activity	vagus nerve tone exocrine gland function	motility of gut, acid (cortisol) sweat gland activity sebaceous gland activity	ulcers dyshydrosis acne
schizophrenia depression addictions lung disease cirrhosis	associative neuronal synaptic activity cortical activity opiates, Valium, barbiturates nicotine alcohol	INTERNEURONAL Dopamine C. norephinephrine Drugs depresants-stimulants enkephalins endorphins	loss of inhibitory function in brain cortical activity cortical stimulation-habituation coffee, cocaine, LSD, etc.	mania hyperstimulation excitatory distortion of awareness

Wilson (1981)

accelerated (Wilson, 1980).

The recognition of vascular responders and individual patterns of response is necessary for both practitioner and patient to gain an understanding of how distress mechanisms relate to physical disorders (Wilson, 1980).

According to Newman (1979), the pattern which is manifested in disease may be regarded as a clue to what is going on in the person's life which he/she may not be able to communicate in any other way. The concept of coronary prone behavior patterns, as described by Friedman (1969) represents a patterned response occurring on a continuum from Pattern A (Type A) to Pattern B (Type B). The characteristics of Type A behavior represent a continual competitive striving for control over environment and may occur in the same fashion over disease as well. The hyper-responsiveness to gain control over stress is followed by a hypo-responsiveness if control is not achieved (Glass, 1977). According to Wilson's model (1980), the coronary prone behavior pattern is a constant arousal of the sympathetic system resulting in coronary heart disease. The hypo-responsiveness, on the other hand, may represent a depressed response or parasympathetic response. Type A individuals may be characterized as people who misuse and abuse the sympathetic system. They have never learned moderation in response, therefore they go from sympathetic arousal to parasympathetic depression.

Prolonged hypo-responsiveness, according to the learned helplessness model of depression, is the result of the individual's exposure to uncontrollable events and the belief that future outcomes will also be uncontrollable. As a result, the individual will exhibit helplessness. The learned helplessness experienced by the individual is attributed to

a cause. Their causal attributions of life events are classified as stable or unstable, global or specific, internal (personal) or external (universal). The attributional choices affect whether future expectations of helplessness will be chronic or transient, affect a range of outcomes or particular outcomes, and involve a loss of self-esteem (Abramson, et al., 1978).

The concept of attribution has particular importance when assessing the impact of life events and present and future expectations of the individual. Each individual's interpretation represents a unique pattern of health. Newman (1980) states that if becoming ill is the individual's only way to manifest his/her patterned response, then it is the "health" of that individual. The relationship of stressful life events to particular behavior patterns has been acknowledged by Glass (1977) and proposed as an avenue to increased prediction of disease. Specifically, for coronary heart disease, uncontrollable life events may be more important than those events which do not involve control issues for the individual.

In the event-illness relationship, according to Fairbanks & Hough (1979), the linkages between life changes and illness include an understanding of interpersonal and personal coping mechanism. The authors state, "It may not be the event which produces adjustment problems and illness, but rather that a kind of person who chooses events also gets ill." (Fairbanks & Hough, 1979, p. 46.) Removal of pathology will not change the patterned response of individuals (Newman, 1980). In the case of coronary-prone individuals, the removal of uncontrollable life events would not be possible and probably would not alter patterned responses of that individual. Further research is indicated to identi-

fy personal meanings individuals assign to life events and therefore their health consciousness.

Using a multidimensional classification system for coronary heart disease, the concepts guiding research will not only reflect current thinking but influence how data are collected and treatment programs are designed (Looney, Lipp, & Spitzer, 1978). The evidence would seem to indicate that interventions such as exercise may assume unique patterns for the individual which manifest in psychological outcomes more complicated than expected. Thus, further research is warranted. The treatment modality of exercise needs to be observed from the theoretical concepts specific to coronary heart disease. The literature seems to indicate that a person with Type A coronary prone behavior patterns presents a general life-style which is congruent with the values of Western society. Exercise represents an intervention which provides an avenue to regain health. What remains unclear and requires further investigation is how exercise influences the individual's patterned response to health. If health is the expansion of consciousness (Newman, 1980), then researchers need to explore the exercise experience in terms of the meaning of that experience to the conscious reflective mind (Omery, 1983).

In conclusion, the following statements summarize the concepts guiding this investigation. Depression may assume a different meaning for people who have never known moderation and over-use or misuse their sympathetic system. The depression may not be a simplistic reaction to illness but part of many intervening variables. Life events have many components. One measure of depression is attribution of uncontrollability and perception of negative or positive impact of life events. Prac-

titioners must pay attention to patterns of response in understanding the theory of health. Interventions must take into account the total pattern of response of the individual. Exercise, as an intervention, offers an avenue of control of illness and path towards health. The viewing of psychological states as just a reaction to illness is a simplistic view of a multidimensional process and merits further investigation.

The postulated interrelationships of concepts are as follows:

1. Type A coronary-prone behavior patterns represent a sympathetic system overload characterized by competitive achievement striving, time urgency, aggressiveness and hostility.

2. When faced with uncontrollable life events, Type A coronary-prone behavior patterned individuals respond with an initial hyper-responsiveness (sympathetic system overload) to gain control. This is followed by hypo-responsiveness/depression (parasympathetic system overload) if control is not achieved.

3. Hypo-responsiveness represents the initiation of the learned helplessness model of depression in which causal attribution is assigned to the uncontrollable events.

4. Intensity of impact of depression is increased as desire for unobtainable outcomes increases; as adversiveness to unavoidable outcomes increases; and as expectations of uncontrollability increases.

5. Life events assume a multidimensional pattern in which the event-illness relationship of negative impact and uncontrollability of events may be the most important in coronary heart disease.

6. Exercise offers three avenues of impacting on the illness process. First is the initial response resulting in positive control

of the illness event. Second, exercise may stimulate a response with negative outcomes if the intervention is perceived as not altering uncontrollability. Last, the intervention may offer some control but with reinforcement of the Type A behavior to maintain control.

7. Illness occurs as both an uncontrollable life event as well as ongoing process. (See Figure 1 and Figure 2.)

Purpose

It was the purpose of this investigation to measure the effects of prescription exercise programs on clients with coronary heart disease. Major questions addressed include whether the parameters of depression in this population could be identified and altered, and if exercise alters coronary-prone behavior profiles. The three parameters of depression that have been reviewed include affect, negative impact of events, and perceptions of uncontrollability (helplessness).

Figure 1

CONCEPTUAL MODEL FOR RESEARCH DESIGN

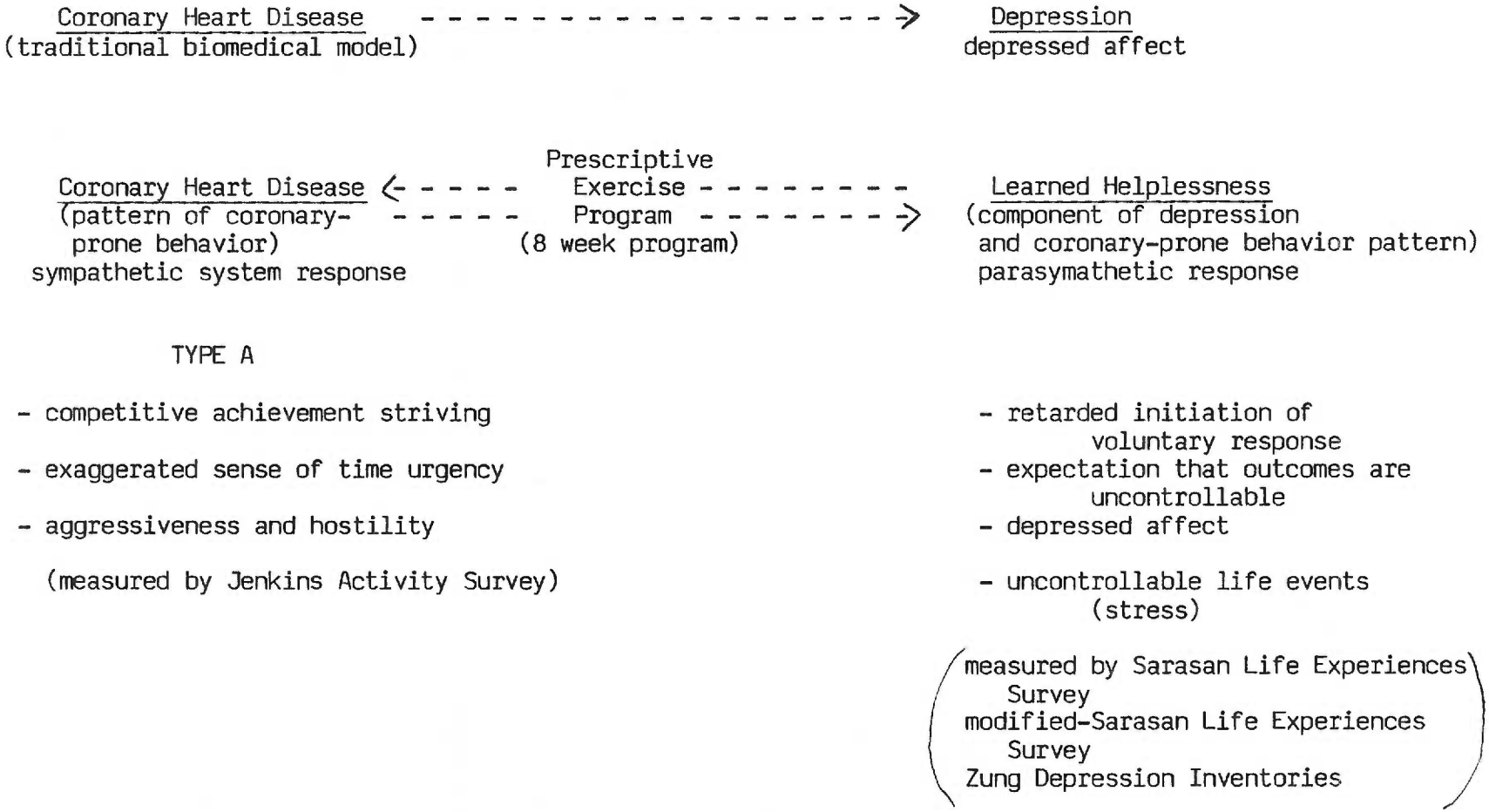
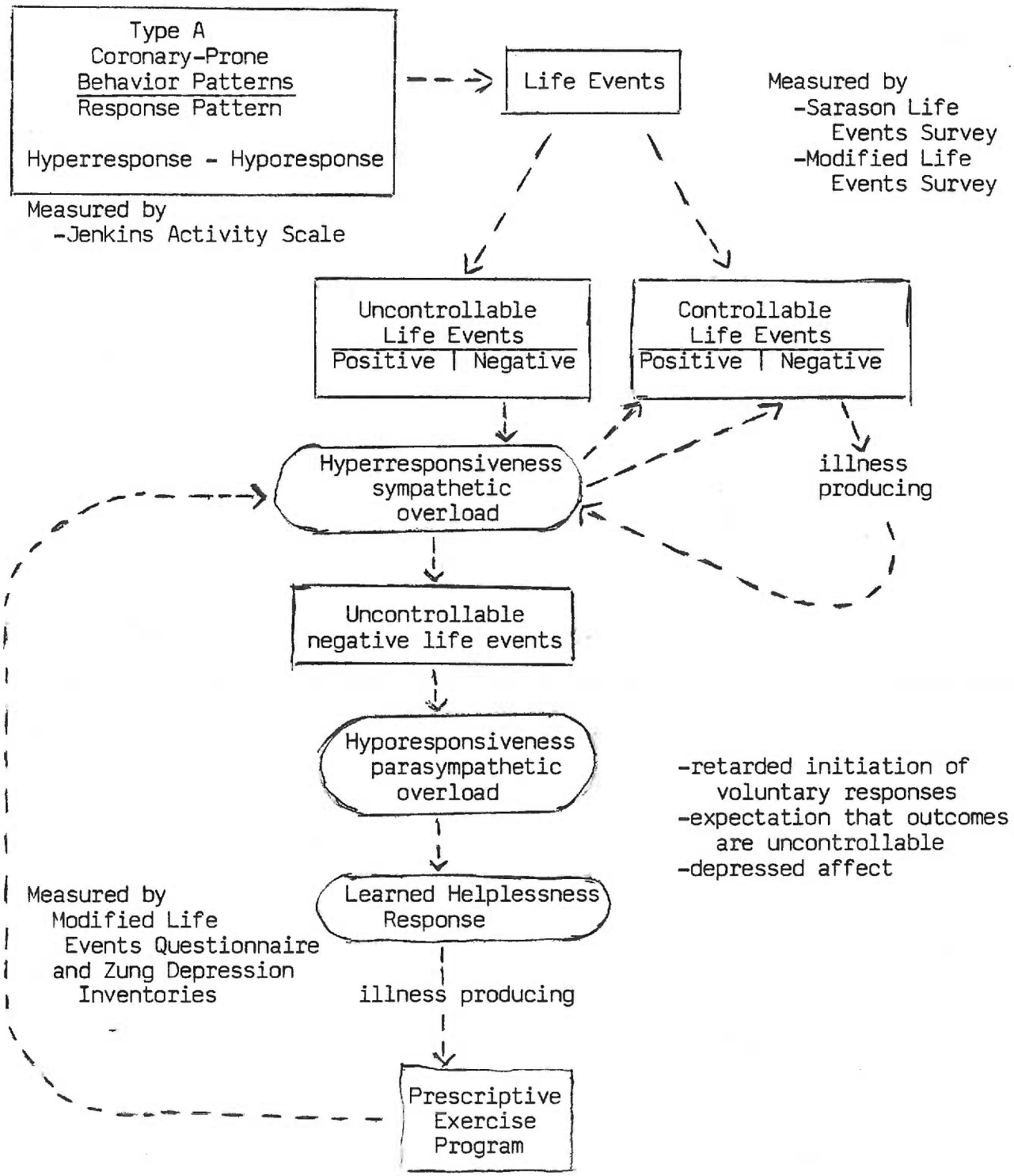


Figure 2

CONCEPTUAL MODEL OF PSYCHOLOGICAL PROCESS
for Patients with Coronary
Heart Disease



Definition of Terms

1. Aerobic exercise - regularly performed activity which is designed to produce at least 60% of maximal heart rate over a specific period of time.
2. Attribution - the cause or meaning assigned to uncontrollable events. Attribution can be stable or unstable, global or specific, internal or external. Attribution determines the generality and chronicity of the individual's helplessness deficits.
3. Coronary-prone behavior pattern - set of overt behavior resulting from the interaction of specific predisposition with appropriately elicting situations. Coronary-prone behavior patterns occur on a continuum from Pattern (Type A) to Pattern (Type B).
4. Global attribution - when helplessness is perceived as occurring in many situations.
5. Hyper-responsiveness - active coping attempts made by individuals to master stressful life events which are perceived as a threat to sense of control.
6. Hypo-responsiveness - the extinction of active coping attempts by individuals due to lack of reward for restless striving. This leads to frustration, exhaustion, and feelings of helplessness.
7. Learned helplessness - the psychological state that frequently results when events are uncontrollable and when the expectation is that the outcome of events is independent of the individual's response.

8. Life events/stressful life events - stimuli or situations to which everyone is exposed to a greater or lesser extent in the natural course of life.
9. Pattern A (Type A) - describes behavior of persons which are characterized by competitive striving, time urgency, aggressiveness and hostility.
10. Pattern B (Type B) - describes behaviors of person which are characterized by little evidence of chronic time urgency, sense of serenity and unhurried movements, less easily aroused anger responses, and recognition of limits without competitive aspects.
11. Personal attribution - the individual's belief that the uncontrollable event is solvable not by himself, but could be solved by others.
12. Prescriptive exercise program - artificially induced exercise program oriented towards improvement of functional capacity and quality of life.
13. Specific attribution - when helplessness is perceived as occurring in one or a few very similar situations.
14. Stable attribution - the characteristics of uncontrollable events are perceived as unchanging.
15. Uncontrollable life events - those life events which are believed to occur outside of any influence.
16. Universal attribution - the individual's belief that uncontrollable events are not solvable by himself or by others.
17. Unstable attribution - the characteristics of uncontrollable life events are perceived as uncertain and subject to change.

Hypothesis

1. There is statistically significant pre-post test reduction in intensity of Type A Coronary Prone Behavior Patterns in coronary heart diseased individuals after eight weeks of prescribed exercise therapy as measured by the Jenkins Activity Survey.
2. There is statistically significant pre-post test reduction in reported intensity of depression scores in coronary heart diseased individuals after eight weeks of prescribed exercise therapy as measured by the Zung Depression Status Inventory and Zung Self-Rating Depression Scale.
3. There is statistically significant pre-post test reduction of magnitude of reported positive and negative impact of life events in coronary heart diseased individuals after 8 weeks of prescribed exercise therapy as measured by the Sarason Life Events Survey.
4. There is statistically significant pre-post test reduction in reported magnitude of impact of controllable or uncontrollable life events in coronary heart diseased individuals after eight weeks of prescribed exercise therapy as measured by the Modified Sarason Life Events Survey.

CHAPTER II

Methodology

Design

This descriptive study represents an attempt to evaluate the effects of an exercise treatment program for cardiac patients. The tools are designed to look at depression in a coronary diseased population. Pre-test and post-test measures have been obtained for all subjects participating in the study. A control condition has not been employed due to the ethical issues surrounding the withholding of treatment from a control group. As such, this study employs a "quasi-experimental" design where treatment is evaluated without the mechanism of control subjects (Cambell & Stanley, 1963).

Subjects

The subjects for this study consisted of the first 17 voluntary male clients entering the Portland Cardio-Pulmonary Research Institute (CAPRI) and the Portland Metro YMCA Cardiac Exercise Program. One subject was eliminated from the study due to failure to remain in the exercise program for the prescribed period of time and a second subject was eliminated due to difficulty with test comprehension.

The data pertaining to characteristics of the subjects is listed in Table 2. It should be noted that all subjects were married and living with their spouses. Only male subjects were included in the study due to the limited numbers of females participating in either program. The time between pre test and post test for subjects ranged from 7 weeks to 11 weeks with 54% tested after 8 weeks of exercise. Post test times varied due to scheduling difficulties with subjects.

TABLE 2

CHARACTERISTICS OF SUBJECTS (N=15)

Characteristic	Number	Percent*
Age (years):		
Range	28 - 71	
Mean	53.0	
S.D.	11.5	
Median	55.0	
Marital Status:		
Married	15	100.0
Other	0	0.0
Occupation:		
Blue Collar	4	26.8
White Collar	8	53.7
Retired	3	20.1
Education (years):		
Range	7 - 19	
Mean	14.1	
S.D.	2.9	
Median	14.3	
Diagnosis:		
Myocardial Infarction	5	33.3
Myocardial Infarction and Angina	3	20.0
Myocardial Infarction and Arrythmia	2	13.4
Angina	2	13.4
Angina and Hypertension	1	6.7
Angina and Emphesema	1	6.7
High Risk Factor	1	6.7
Surgical Intervention:		
Surgery	7	46.7
No Surgery	8	53.3
Program Used:		
CAPRI	8	53.3
Metro Y	7	46.7

*May not add up to 100% due to rounding of numbers.

All subjects reported that they had participated in individual exercises such as walking or swimming on a regular basis prior to joining the prescriptive exercise classes. Over 80% of the subjects reported that they continued to exercise on their own in addition to the program. In reporting the number of sessions missed during the pre-post testing times, the average number of sessions missed was 5. This number may be due to the testing times overlapping three holidays.

Seventy-three percent of the subjects were diagnosed as having heart disease in 1983 with the remaining 27% diagnosed between 1956 and 1982. Fourteen subjects (93%) reported that they first "suspected" they had heart disease at the same time it was diagnosed by their physician. The medical diagnoses which are listed in Table 1 are based on the physician's assessment of the subject's cardiovascular status.

Data Collection Instruments

Jenkins Activity Survey. The Jenkins Activity Survey (JAS) is an objective self-administered questionnaire developed by Jenkins, Rosenman, and Zyzanski (1965). The JAS is a self-rating scale designed to identify the Type A behavioral response from Type B behavioral response on a continuous A-B continuum. The Type A behaviors are characterized by restless striving, time urgency, aggressiveness, and competition. The survey consists of 52 items and is scored on four scales. First, the Type A scale assesses the multifactorial clinical construct of "coronary-prone behavior patterns." The three remaining scales measure factorially independent components of this broader construct which are Speed and Impatience, Job Involvement, Hard Driving, and Competitive. The JAS is not a measure of physical activity or

stress. The JAS has been standardized for use with a working or only recently unemployed male population. Normative data for the JAS has been based on the JAS scores of the Western Collaborative Group Study male participants (N:2,588). The mean score for the WCGS population was transformed to 0 with a standard deviation of 10 for all scales. Positive scores indicate the Type A direction, and negative scores a Type B direction. Standard scores are converted from raw scores and correspond with a percentile equivalent. For example, a standard score of 5 falls into the 65th percentile. This indicates the subject's score surpasses at least 63% of the normative population.

The reliability of the JAS scales has been computed for internal consistency and test-retest stability. The internal consistency reliability coefficients for the Type A scale approached 0.83 in Kendall tau b coefficients and 0.85 in the squared multiple correlation. The four JAS scales show uniform reliability coefficients of SMC estimates ranging from 0.73 to 0.85. Retest coefficients after a 4 to 6 month period ranged from 0.65 to 0.82.

The validity of the JAS has been established through structured interview, discrimination of groups with coronary heart disease from prevalence studies, and prospective findings of JAS scores as a predictor of CHD (Jenkins, et al. 1965).

Sarason Life Experiences Survey (LES). The Sarason Life Experiences Survey (Sarason, Johnson, and Siegal, 1978) provides measurements of characteristics of life stress beyond those found in the Holmes and Rahe Social Readjustment Rating Scale (1967). The survey was developed by Sarason, Johnson, and Seigel (1978) at the University of Washington.

The LES is a 57-item self-report measure that allows subjects to

indicate events experienced up to one year prior to testing. The ratings of life events are made on a 7-point Likert scale ranging from very positive to very negative according to impact. Subjects are asked to rate the perceived negative or positive impact of the particular event on their life at the time of occurrence.

In test-retest reliability, the LES has been found to be a moderately reliable instrument, especially when negative life events and total change scores are considered. In test-retest reliability studies, the reliability of coefficients for negative change scores were .56 ($p \leq .001$) and .88 ($p \leq .001$). Validity of the instrument with other stress related instruments was satisfactory. The LES scores have also been found to have a significant relationship between negative change scores and scores on the Beck Depression Inventory (Sarason, Johnson, and Seigel, 1978).

Sarason, et al. (1978) in a study of college students obtained general information regarding responses to the LES and identified that for males the mean positive scores were 9.7 (S.D.=8.0) and mean negative scores were 6.2 (S.D.=4.7). An additional study comparing college students in treatment at a counseling center and students selected at random identified scores for center students as positive, 8.3 (S.D.=8.3), and negative 16.6 (S.D.=9.4). Scores for normals were 10.6 (S.D.=8.3) for positive scores and 9.6 (S.D.=9.6) for negative scores. Both studies were limited to college students.

Modified Life Experiences Survey (MLES). The modified LES has been designed by this investigator to allow subjects to indicate the events experienced up to one year prior to testing. As much as possible, the terminology was designed to match the Sarason Life Events

Survey. The ratings of life events are made on a 7-point Likert scale ranging from very positive to very negative. The subjects are asked to rate their perception of events they have control or lack of control over. At this time no attempt has been made to define attribution of control and uncontrollability. Also included are two questions geared toward the participants' projected prediction of success. A pilot test of the instrument has been made by the researcher to assure appropriate data collection protocols.

Zung Depression Inventories: Depression Status Inventory (DSI) and Self Rating Depression Scale (SDS). The DSI and SDS are instruments designed by W. Zung to be used conjointly in measuring depression. Zung (1974) defines depression as an affect or feeling tone which in the human being extends on a continuum from normal mood swings to a pathological state.

(1) Depression Status Inventory. The DSI is a 20-item semi-structured interviewer-rated depression instrument. The 20-question interview guide is based on the most common clinical symptoms of depression. These include pervasive affective disturbances, physiological disturbances, psychomotor disturbances, and psychological disturbances. Each question is judged on a 4-point scale of observed or reported responses with "1" indicating insignificant and "4" indicating severe intensity.

The split-half (odd even) reliability of the DSI has been demonstrated by Zung (1972) at 0.81 ($p \leq 0.01$) in a sample of 225 patients.

(2) Self Rating Depression Scale. The SDS is a 20-item self-rating instrument which measures the same clinical symptoms of depression as the DSI. Responses are given a 4-point scale rating according to quantitative terms ranging from "none of the time" to "most of the

time." A value is assigned a response according to positive or negative wording.

The split-half (odd-even) reliability coefficient of the revised SDS in a sample of 225 patients was found to be 0.73 ($p \leq 0.1$). In term of validity, the original (1965) scale was found to have a high correlation (r of 0.70) with the MMPI Depression Subscale in a sample of 152 patients (Zung, 1967). Scores for patients diagnosed in a clinical setting using the Zung SDS Index averaged 74 for inpatients and 65 for outpatients. An index ranging from 25-100 is obtained by multiplying the sum of the scores by 1.25. The estimated degree of depression is 50-59 (mild to moderate), 60-69 (moderate to severe), and 70 and over (severe). The Zung has been determined to be stable for the variables of age, sex, marital status, intelligence, and educational level (Zung, 1965). Stern, Pascale, and Ackerman (1977), when testing cardiac patients, identified average scores of greater than 40 as being predictive of patients having difficulty with rehabilitation.

Procedure

This study was descriptive in nature with the subjects serving as their own controls in pre- and post-testing. There was no control for age, marital status, diagnosis, or support system. The focus of the investigation was to measure the effect of the independent variable, prescriptive exercise, on the dependent variables. These included coronary-prone behavior patterns, perception of positive or negative impact of life events, and attribution of uncontrollability (helplessness) to life events. The dependent variable of coronary-prone behavior patterns was measured by the Jenkins Activity Survey. The dependent

variable of perception of positive or negative impact of life events was measured by the Sarason Life Experiences Survey. Uncontrollability, a dependent variable, was measured by the Modified Life Experiences Survey. Finally, the dependent variable of depressed affect was measured by the Zung depression scales.

Approval for subject participation from one agency was obtained from the medical and program directors. Approval from the second program was obtained from the medical director, program director, nursing staff, and each referring primary physician. Subjects were contacted by the investigator after their physician referral was received by the CAPRI and YMCA heart programs. Subjects were asked to volunteer to participate in an investigation of the effect of an exercise program on their life-style. Each person had signed a consent form assuring participant confidentiality. The pre- testing occurred prior to the initiation of the prescriptive exercise program or within the first week of the program.

CAPRI and the Metro YMCA provide prescriptive exercise programs specifically tailored for each subject after completion of the initial physiological evaluations by the medical directors of the two centers. The physiological evaluations include past history, physical exam, 12 lead resting electrocardiogram, and a multi-stage exercise tolerance test. This data was routinely collected and information relating to the study was made available to the researcher.

The multi-stage exercise tolerance test consisted of measurements obtained from a maximal exercise tolerance test on a standard motor drive treadmill. These measurements include exercise tolerance time, functional aerobic impairment, and pressure product rate. Subjects

were monitored on the treadmill to determine the maximal limits of exertion for that individual. These measurements were collected by the CAPRI and Metro Y staff but are not included in this study.

The protocol for the exercise training program included a 45 minute session which met three times per week. The initial phase of class was a warm-up session, followed by a walk-jog exercise, and concluded with a cool-down session. The workload for the individual was gradually increased over the duration of the program. This was to achieve an aerobic training response of 70% to 80% of the maximal exercise tolerance test.

After completion of an average of 8 weeks of the exercise program the subjects were again retested by the researcher using the psychological tools previously mentioned.

Data Analysis

Basic descriptive statistics were utilized for subjects' health appraisal information and reported in means and percentages. Paired t tests were used to compare pre-post test changes for the four hypotheses in this study. Correlation coefficients of a selected group of variables were used to describe the relationship between variables. Because of the small sample size and outliers, both Pearson's r and Kendall's tau were computed.

CHAPTER III

Results and Discussion

This investigation focused on the identification of psychological variables which contribute to coronary-prone behavior and to determine if exercise (independent variable) alters the parameters of depression and coronary-prone behavior profiles. Subjects' perception of projected and achieved health ratings and social networks were also described.

This chapter was organized into three parts. The first includes a description of subjects' social networks. In the second section, descriptions are made of health appraisals pre and post exercise therapy. Finally, the expected effects of prescriptive exercise on psychological variables as identified by hypotheses one through four were addressed. The problems of evaluating approximately two hundred variables were simplified by summarizing into five variables. These include coronary-prone behavior profiles (1 variable), depression inventory scores (2 variables), and life event indexes (2 variables).

Information regarding social networks of subjects was obtained in the questionnaire by asking subjects to estimate concrete aid and emotional support from family and non-family members and to estimate participation in clubs or organizations. Pre-post test differences in mean scores in support networks are shown in Figure 3. Mean scores for organizational involvement are found in Table 3. The range in mean scores for estimated support from family and non-family members in pre and post tests ranged from 4.7 to 14.4. There was no significant change in perception of support from pre-post tests. Both Pearson's r and Kendall's tau were used to evaluate significance and none was

FIGURE 3

PRE-POST TEST DIFFERENCES

IN MEAN SCORES IN SUPPORT NETWORKS

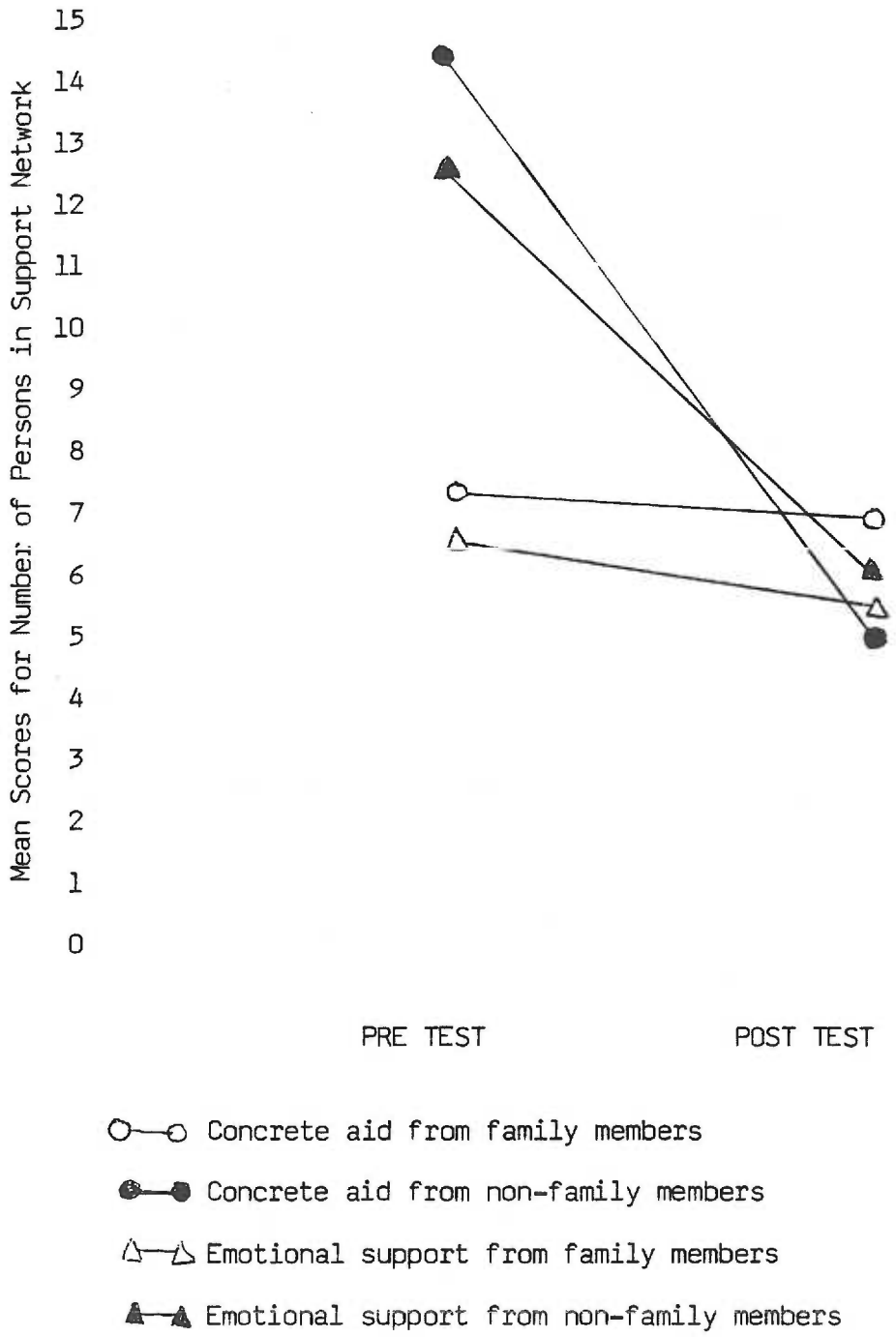


TABLE 3

PRE-POST TEST DIFFERENCES IN SUPPORT NETWORKS, HEALTH PERCEPTIONS, LIFE EVENTS, DEPRESSION, AND CORONARY-PRONE BEHAVIOR PATTERN SCORES

	PRE TEST SCORES		POST TEST SCORES			
SUPPORT NETWORKS	MEAN	S.D.	MEAN	S.D.	T VALUE	STABILITY COEFFICIENTS
1. Concrete aid from family members	7.3	4.8	6.6	5.7	0.47	0.34
2. Concrete aid from non-family members	14.4	26.6	4.7	6.7	1.43	0.17
3. Emotional support from family members	6.7	4.9	5.2	3.2	1.08	0.28
4. Emotional support from non-family members	12.6	3.3	6.3	6.7	1.15	0.44
5. Number of professional organizations	0.5	0.7	0.4	0.7	1.00	0.76
6. Number of non-professional organizations	1.1	1.1	1.4	1.9	-1.43	0.70
7. Number of religious organizations	0.7	1.2	0.5	0.8	0.90	0.71
HEALTH PERCEPTIONS						
1. Health now to past (ipsitive)	2.5	0.7	2.2	0.7	2.09*	0.67
2. Health to others (normative)	2.5	0.7	2.4	0.7	0.32	0.42
3. Health of self predicted/ reached after exercise	2.2	0.7	1.9	0.5	1.58	0.08
4. Health predicted/reached after exercise compared to others	1.6	1.3	1.5	0.8	0.23	0.54
5. Health predicted of self in 6 months	2.3	0.6	2.1	1.0	1.17	0.52
6. Health predicted compared to others in 6 months	1.8	1.5	2.1	1.0	-0.84	0.57

TABLE 3, (Cont.,)

	PRE TEST SCORES		POST TEST SCORES			
	MEAN	S.D.	MEAN	S.D.	T VALUE	STABILITY COEFFICIENTS
CORONARY-PRONE BEHAVIOR PATTERNS						
1. Jenkins STD A	3.6	11.7	1.2	11.6	1.64	0.87
2. Jenkins STD S	1.1	11.0	0.8	12.4	0.24	0.95
3. Jenkins STD J	-2.5	7.8	-1.9	6.2	-0.47	0.75
4. Jenkins STD H	-1.8	12.5	-4.2	11.4	1.45	0.83
SARASON LIFE EVENTS (STANDARD AND MODIFIED)						
1. Negative life events	-6.0	6.8	-4.2	4.2	-1.56	0.77
2. Positive life events	3.8	3.5	3.9	3.9	-0.07	0.38
3. Modified negative life events	-2.6	8.7	-2.1	5.1	-0.27	0.47
4. Modified positive life events	2.4	2.2	3.8	3.7	-1.41	0.23
DEPRESSION SCORES						
1. Depression Status Inventory	30.0	7.4	27.4	7.2	2.92**	0.88
2. Self Rating Depression Scores	34.1	8.8	32.1	5.6	1.29	0.71

*p .05 **p .01

noted. Organizational participation was included as a measure of involvement or non-involvement in structured groups. The mean pre-post test scores appear to indicate for all three groups combined (professional, non-professional, and religious) that subjects did identify an average membership of two groups per person. It is also important to note that all subjects reported that they were married and living with their spouse.

The purpose of gathering information regarding social networks and organizational participation was to identify quantity of support subjects perceived, rather than quality. Lynch (1977) reviewed the influence of human companionship from all other factors that are known to affect cardiac problems. In his review of literature he identified social stability as a factor in reducing the incidence of coronary heart disease. It was a central assumption of Lynch (1977) that a person's life may be shortened by the lack of human companionship. Lynch (1977) went on to state that the mortality statistics for heart disease among those adult Americans who are not married were two to three times higher than for married individuals. When reviewing the quality of marital satisfaction, Friedman and Rosenman (1974) observed that Type A individuals engaged in a life-style which lent itself to social isolation from family and friends. In this present study, no attempt was made to explore the quality of support networks or validate the perceptions of support.

Health ratings by the subjects were obtained from responses to six questions. In the first two questions, subjects were asked to rate health on a continuum from (1) excellent, (2) good, (3) fair, or (4) poor. Pre-post test means are listed in Table 3. Subjects' mean

scores for both pre test items ranged midway from fair to good and shifted towards a more positive rating for both questions in the mean post test scores. This positive shift in health rating was statistically significant ($p \leq .05$) when comparing pre-post test changes of health of self at present compared to past.

Subjects were also asked when completing the pre tests to predict health ratings after exercise therapy (approximately 8 weeks) and to again assess their ratings when completing the post test after exercise. Subjects rated health on a 7-point likert scale ranging from extremely negative (-3) to extremely positive (+3). All mean health ratings at both pre test and post test were positive. The lowest mean rating was 1.5 (1=slightly positive, 2=moderately positive). Subjects indicated that they expected positive results from the exercise program and they continued to experience positive results at post testing.

According to Schmale (1982), one of the important predictors of outcomes for patients who have had myocardial infarction was the straight forward method of asking patients what they anticipated. Schmale (1982) concluded that people predicted fairly accurately at the time of hospitalization what their health outcomes would be. The clinician needs both self report and observed evaluation for assessment of outcomes or adaptation (Schmale, 1982). In this study, the subjects self reported predictions of outcomes and evaluation of outcomes of exercise were consistent with those findings.

The first hypothesis stated that there would be a statistically significant pre-post test reduction in intensity of Type A Coronary-Prone Behavior Patterns in coronary heart diseased individuals after eight weeks of prescribed exercise therapy as measured by the Jenkins

Activity Survey. This hypothesis was not supported by the findings in the present study. The change values for each of the four Jenkins scores failed to reach significance. See Table 3 for pre-post test mean scores and Figure 4 for the illustrated graph of pre-post test mean scores. For this sample, the standard error was 3.03 in pre testing and 3.0 in post testing. In reviewing the mean pre-post test change scores, there was no clear trend noted. Inspection of individual scores for pre-post test changes indicate that four subjects made a shift of greater than the standard error of 3.0 toward Type B behavior and five subjects shifted greater than 3.0 standard error points towards Type A behavior. See Table 4 for individual pre-post test scores. The pre test individual scores indicated that ten subjects rated with scores of 3.0 or greater representing a Type A group and five subjects scored lower than -3.0 for a Type B group. Only four subjects who were identified as Type A's on pre test made shifts of more than 3 points towards Type B. Three of the Type A group made shifts of more than 3 points toward increased Type A behavior. Differences between the Type A and Type B groups and selected variables were evaluated using the Paired t test. No significant differences were noted. However, Type A's scored higher on the SDS measure of depression than B's and this difference approached statistical significance ($p=.054$).

In interpreting the JAS results, the differences of fewer than 5 standard scores may be attributed to measurement error, and should not be overinterpreted. The JAS scores have been found to be associated with an increased risk of coronary heart disease (Jenkins, Rosenman, and Zyanski, 1965). With regard to recurrent myocardial infarction,

FIGURE 4

PRE-POST TEST DIFFERENCES IN MEAN SCORES

IN CORONARY-PRONE BEHAVIOR PATTERNS

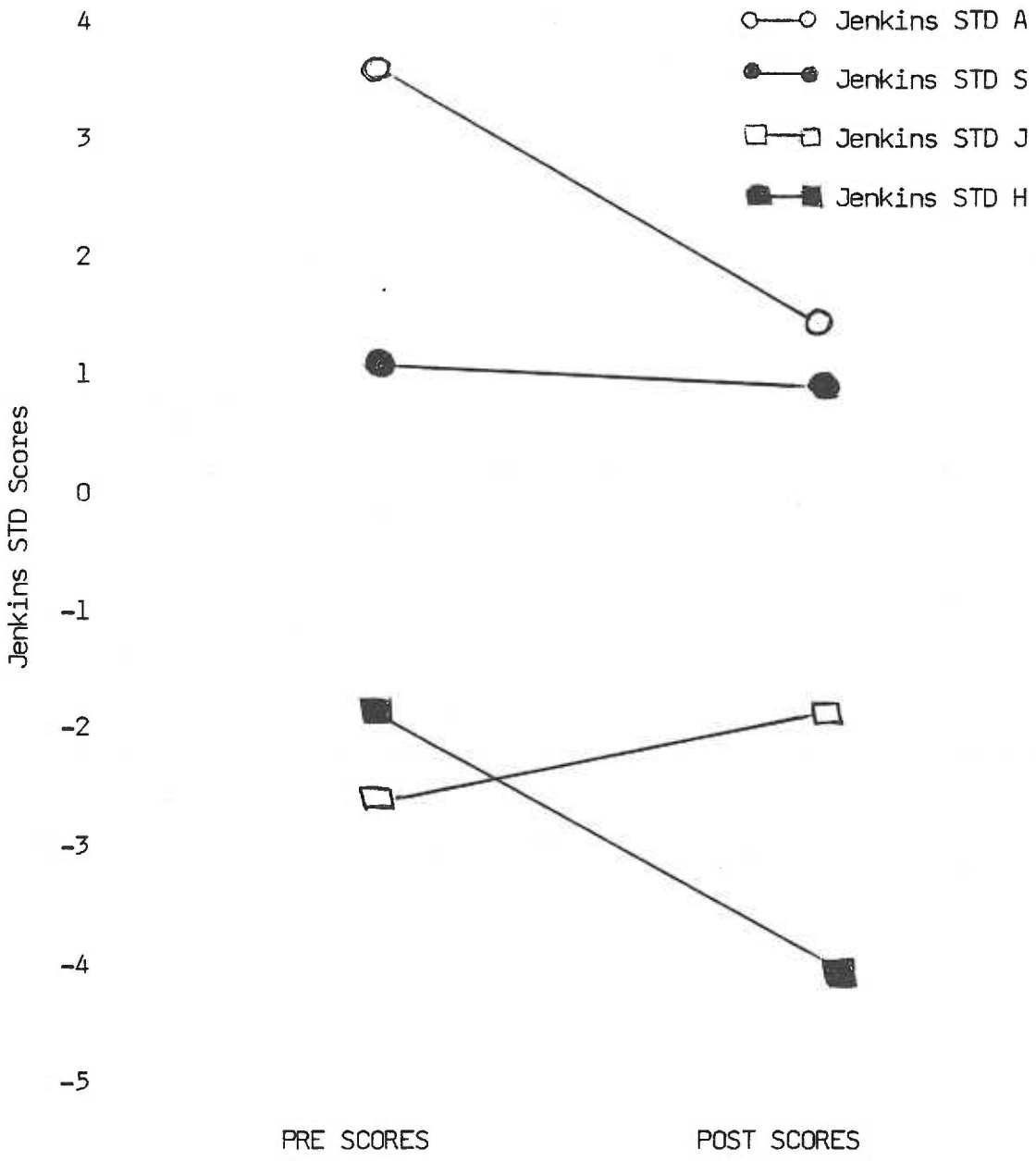


TABLE 4

PRE-POST TEST INDIVIDUAL SCORES

FOR THE JENKINS STD A

PRE TEST	POST TEST
-16.0	-16.6
-14.4	-15.2
-10.8	-7.4
-3.2	-14.2
0.2	2.4
3.4	2.0
3.8	6.8
4.4	-4.4
4.4	4.4
5.0	8.2
7.6	-8.2
8.6	12.4
16.4	14.0
21.4	15.2
24.2	18.2

Pre Test:	Post Test:
Mean: 3.7	Mean: 1.20
Median: 4.3	Median: 2.4
STD ER: 3.0	STD ER: 3.0

Type A scores were found to be the strongest predictor of recurrent coronary heart disease. Other variables which were strong predictors were number of cigarettes smoked per day and serum cholesterol levels (Jenkins, Zyzanski, Rosenman, and Cleveland, 1971).

In a similar study of the effects of exercise on Type A Behavior Patterns, Blumenthal, et al. (1980) found significant delines in Type A coronary profiles and no shifts in Type B profiles after exercise therapy. The 10-week prescriptive exercise program for the subjects in the Blumenthal, et al. (1980) study and the exercise program used in the present study were similar in design. A major difference in subjects for this study compared to the Blumenthal, et al. (1980) report was health status, sex, and age. The Blumental, et al. (1980) study consisted of 50 subjects (male and female) who were found to be free of any overt cardiovascular disease. In this investigation, 14 subjects had been diagnosed with cardiovascular disease and 1 subject with high risk factors. The age of subjects in the Blumenthal, et al. (1980) study were an average of 10 years younger than subjects in the present study ($\underline{m}$=42.6 years; $\underline{m}$=53.0 years). The differences in numbers included in each study (N=50; N=15) were significantly different and may have been an important factor in the differences in the results of these studies.

The second hypothesis stated that there would be statistically significant pre-post test reduction in reported intensity of depression scores in coronary heart diseased individuals after eight weeks of prescribed exercise therapy as measured by the Zung Depression Status Inventory and the Zung Self-Rating Depression Scale. This hypothesis was not entirely supported by the findings in the present study. See

Table 3 for pre-post test mean scores for DSI and SDS ratings. At either the pre or post testing, no subject attained scores considered to be within the depressed range (Zung, 1965, 1972). However, there was a shift ($p \leq .01$) in DSI pre-post test scores. This three point average decrease in scores indicated a shift away from depression.

The Zung depression scales centered on somatic complaints, unclear cognition, sense of uselessness, decreased libido, and lack of meaning in life as indicative of depression. These symptoms were not reported in a range indicating depression in the present study. Stern, et al. (1977) compared depressed and non-depressed groups of patients with myocardial infarction and found that subjects in his study who had SDS ratings of greater than 40 failed to return to work or remain at work, had more difficulty with sexual functioning, and had higher hospital readmission rates. Stern, et al. (1977) also reported that compared to the non-depressed group, the depressed group of patients reported that the physical symptoms caused them to feel out of control and discouraged. According to Stern, et al. (1980) scores greater than 40 might be utilized as indicators of poor adjustment during the rehabilitation phase of cardiac disease. Furrow (1980) in an unpublished clinical investigation of coronary heart disease patients utilized the Zung SDS as one measure of rehabilitation outcomes for patients. The results indicated that those patients pre-tested prior to discharge from hospital and post-tested seven weeks after discharge had overall pre-post test scores under 45 points. This indicates that minimal depression was found prior to patients leaving the hospital as well as seven weeks post hospitalization.

Erberle (1978) studied the psychological and physiological effects

of a cardiac rehabilitation exercise training program over a twelve-week period. Using the Beck Depression Inventory for the identification of depression, Erberle (1978) identified little or no evidence of depression in subjects at pre testing and no change in scores at post testing.

In contrast to the previously mentioned studies, Hellerstein (1968) found a high degree of depression in subjects with coronary heart disease as identified by the MMPI depression scale. After six months of exercise, the depression scores were significantly decreased. Hellerstein (1968) concluded that subjects with serious coronary heart disease had higher depression scores as compared to subjects with less serious heart diseases.

Several factors might have influenced the low incidence of depression for subjects in the present study. The time between onset of illness and entry into the prescriptive exercise program ranged from 13 years to 2 months. Seventy-three percent of the subjects experienced onset of illness in 1983, and of that group, time from onset of illness to entry into the program ranged from 2 to 20 months with an average of 4 months. All subjects were married and indicated having a support network. Health ratings at entry into the program were rated as positive. Additional data obtained which was not part of the design indicated that over 90% of subjects were participating in some form of regular exercise (i.e., walking, swimming, jogging) prior to entering the program.

The third hypothesis states that there is statistically significant pre-post test reduction in magnitude of reported positive and negative impact of life events in coronary heart diseased individuals after

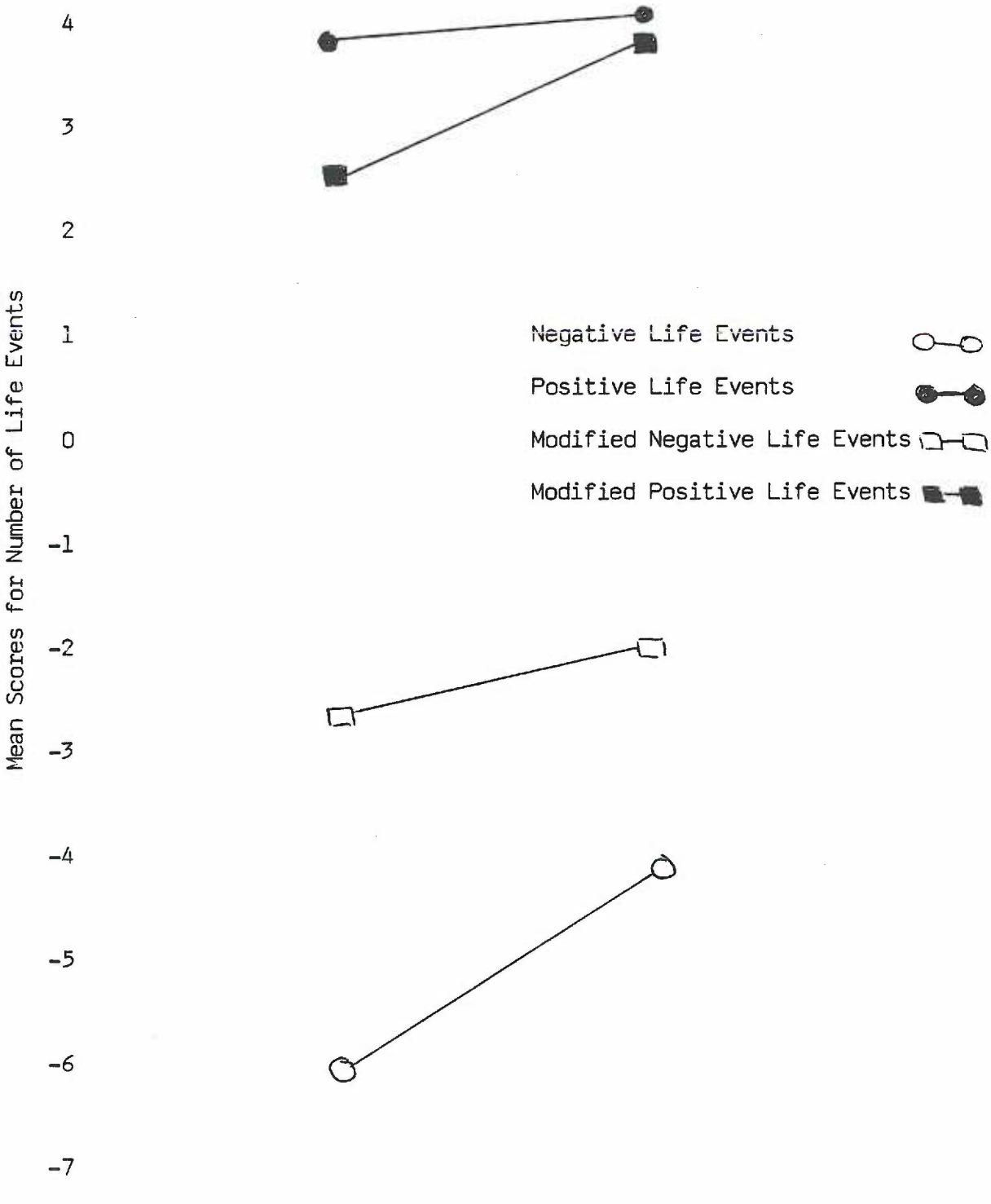
eight weeks of prescribed exercise therapy as measured by the Sarasan Life Events Survey. This hypothesis was not supported by the present study. See Table 3 for pre-post test mean scores. Pre-post test results of negative life events indicated a mean score shift towards less negative perception of events. Pre-post test mean scores for positive life events indicated no change in subjects' perception. (See Figure 4 for pre-post test differences.

In this present study, total change scores were not calculated. Vinokur and Selzer (1975) using a modified SRE found that negative scores were more predictive of depression than total scores. These results are consistent with the finding of Sarason, et al. (1978) who identified a significant relationship between LES negative change scores and the Beck Depression Inventory.

The fourth hypothesis stated that there would be statistically significant pre-post test reduction in reported magnitude of impact of controllable or uncontrollable life events in coronary heart diseased individuals after eight weeks of prescribed exercise therapy as measured by the Modified Life Events Survey. This hypothesis was not supported by the present study. Scores for the MLES were obtained by comparing the amount of perceived control or uncontrollability over positive and negative events in pre-post test scores. Change in perceived control over positive life events and negative life events was then calculated. See Table 3 for mean pre-post test results and Figure 5 for pre-post test differences. There was no change in pre-post test scores for change in perception of control/uncontrollability in negative life events. There was a slight shift in pre-post test mean scores towards more control over positive events, but this

FIGURE 5

PRE-POST TEST DIFFERENCES IN MEAN SCORES
FOR SARASON LIFE EVENTS QUESTIONNAIRE
AND MODIFIED LIFE EVENTS QUESTIONNAIRE



shift did not reach statistical significance.

Since subjects in the present study served as their own control for pre-post testing, no comparison data is available. Connolly (1976) compared coronary patients to a control group of non-coronary persons and did find a significant increase in the number of independent (uncontrollable) life events prior to infarction. Glass (1977) also concluded that helplessness-inducing life events are more likely to occur in individuals with illness as compared to individuals without physical disease. In the Glass (1977) study, items for the Loss Index (prodromal helplessness-inducing events) were assigned apriori to testing by researchers. In the present study, the assignment of controllable/uncontrollable values to events was made by each individual subject. While the results in the present study were not found significant, the shift indicates that this merits further investigation.

A comparison of interrelationships in select dependent variables (depression scores, life events, and Jenkins STD A scores) was also made. Correlation matrixes of pre test, post test, and pre-post test relationships are shown in Tables 5 and 6. Because of the relatively small sample size and problems with outliers, both Pearson's r and Kendall's tau correlations were completed. The discussion of pre test correlations is limited to those variables which are significant in both Pearson's r and Kendall's tau correlation.

The examination of the pre test Depression Status Inventory (DSI) indicated that it was significantly correlated to the Self Rating Depression Scale (SDS) at the .001 level (Pearson's r) and .01 (Kendall's tau). The DSI scores also significantly correlated with

TABLE 5

CORRELATION MATRIX OF DEPRESSION SCORES, LIFE EVENTS, AND JENKINS STD A SCALE

(PRE TEST)

PRE TEST	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Depression Status Inventory (1)	1.00	0.86***	-0.73***	0.71***	-0.61**	-0.36	0.24
Self Rating Depression Scale (2)	0.47**	1.00	-0.76***	0.62**	-0.57*	-0.44*	0.18
Negative Life Events (3)	-0.45*	-0.28	1.00	-0.42	0.68**	0.48*	-0.06
Positive Life Events (4)	0.26	0.19	-0.63	1.00	-0.60**	0.01	0.16
Modified Negative Life Events (5)	-0.13	-0.13	0.03	-0.43*	1.00	0.43	0.14
Modified Positive Life Events (6)	-0.15	-0.15	0.23	0.21	0.18	1.00	0.21
Jenkins STD A (7)	0.27	0.20	-0.10	0.05	0.19	0.05	1.00

*p .05 **p .01 ***p .001 Notation of significance appears above correlation

Note: Top half of graph contains Pearson Produce Moment Correlation Coefficients. Because of problems with outliers and the relatively small sample size, the bottom half contains Kendall's Tau Coefficients.

TABLE 6

CORRELATION MATRIX OF DEPRESSION SCORES, LIFE EVENTS, AND JENKINS STD A SCALE

(POST TEST)

POST TEST	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Depression Status Inventory (1)	1.00	0.71**	-0.60**	0.20	-0.15	-0.11	0.32
Self Rating Depression Scale (2)	0.38	1.00	-0.47*	0.00	-0.34	0.27	-0.04
Negative Life Events (3)	-0.41	-0.26	1.00	0.05	0.35	0.38	-0.41
Positive Life Events (4)	0.16	-0.01	0.04	1.00	-0.36	0.39	0.33
Modified Negative Life Events (5)	-0.07	-0.22	0.23	-0.17	1.00	0.43	0.18
Modified Positive Life Events (6)	-0.10	-0.24	0.34	0.48**	0.31	1.00	0.35
Jenkins STD A (7)	0.35	-0.06	-0.31	0.26	0.10	0.31	1.00

*p .05 **p .01 ***p .001 Notation of significance appears above correlation

Note: Top half of graph contains Pearson Produce Moment Correlation Coefficients. Because of problems with outliers and the relatively small sample size, the bottom half contains Kendall's Tau Coefficients.

negative life events at p=.001 (Pearson's r) and p=.05 (Kendall's tau). There was also a significant correlation between DSI scores and modified negative life events. The correlation between depression scores was expected as both scales measure the same qualities of depression (subject rated; observer rated). The significant correlation between DSI scores and negative life events and modified negative life events was also an expected outcome. This indicated that as depression scores decreased so did the perception of impact of negative life events and modified negative life events.

The examination of post test correlations indicated that the DSI scores were significant at p=.01 for SDS and negative life events. These relationships did not reach significance using Kendall's tau.

Examination of pre-post test stability coefficient for the depression scales, life events scales, and Jenkins STD A scale indicate a high level of stability for Depression Status Inventory, Self Rating Depression Scale, Negative Life Events, and Jenkins Scale (see Table 7). These scores reflect stability but are not indicative of relative changes in mean scores of the sample.

While the results of the present study failed to achieve significance, there were shifts in rating which merit further investigation. These include reduction of depression scores (DSI) after exercise training, mean score shifts towards less negative perception of events after exercise, and shifts toward greater control perceived over positive events at post testing. Correlations of selected variables which merit further investigation include the relationship of depression scores with both negative life events and modified negative life events.

Several limitations were inherent to the study. First, the size

TABLE 7

CORRELATION MATRIX OF DEPRESSION SCORES, LIFE EVENTS, AND JENKINS STD A SCALE FOR PRE POST TEST

	POST TEST						
PRE TEST	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Depression Status Inventory (1)	0.88***						
Self Rating Depression Scale (2)		0.71***					
Negative Life Events (3)			0.76***				
Positive Life Events (4)				0.38			
Modified Negative Life Events (5)					0.47*		
Modified Positive Life Events (6)						0.23	
Jenkins STD A (7)							0.87***

*p≤.05 **p≤.01 ***p≤.001

of the sample was small, thereby limiting statistical interpretation. Second, the group of subjects did not demonstrate significant levels of depression. Several factors may have played a role in the depression scores. It is unclear if this was due to limitations of the tool, the time elapsed since onset of illness, or pre-program exercise. Third, the group itself may represent a skewed sampling of coronary heart diseased individuals. The participants of this study were "healthy" enough to participate in an exercise program. Fourth, the prescriptive exercise program itself provided a support group for participating subjects. Finally, no control group was utilized for comparisons.

CHAPTER IV

Summary, Conclusions and Recommendations

Summary and Conclusions:

The purpose of this investigation was to measure the psychological effects of a prescriptive exercise program on clients with coronary heart disease. The identification of psychological variables of depression which might have related to coronary-prone behavior profiles and the effect of a prescriptive exercise program (independent variable) on coronary-prone behavior profiles and the parameters of depression were investigated. An assessment of health status and social support networks was also included.

The study was descriptive and longitudinal in design. It consisted of a sample size of fifteen subjects with the group serving as its own control. The independent variable was the prescriptive exercise program used by the Portland CAPRI and Portland Metro Y. The psychological variables (dependent) included life events as measured by the Sarasan Life Events Questionnaire and Modified Life Events Questionnaire; depression ratings as measured by Zung's Depression Status Inventory and Self Rating Depression Survey; and coronary-prone behavior profiles as measured by the Jenkins Activity Survey. The psychological data was obtained within the first week of initiation of the exercise program and at completion of an average of eight weeks (approximately 24 exercise sessions).

The psychological data was analyzed by using the Paired t test and correlation matrix of selected variables. Health ratings and support networks were evaluated by descriptive statistics.

The fact that psychological factors play a role in illness, especially life threatening illness, is unquestionable. Attempts to identify the role of psychological factors continues to be difficult. Depression was not evident in this population of subjects and therefore the relationship between physical exercise and depression remains unclear. As stated in the conceptual model, depression may assume a different meaning for coronary-prone individuals and this might not be a simplistic affective state but part of an interrelationship of many variables. The initial concepts of learned-helplessness evolved from studies of students and normal populations and therefore have limitations when applied to disease specific populations. The conceptual model does not separate if learned-helplessness is a state or trait phenomena. The need for further direct observation is indicated. Tinbergen (1974) has suggested that psychology as a science has skipped the preliminary descriptive stage in its attempt to become a respectable science and has neglected to describe phenomena as it is occurring.

The concept of depression and coronary heart disease has yielded conflicting results in several studies (Tern, 1977, Erberle, 1978, Hellerstein, 1968, Glass, 1972, Furrow, 1980). The results need further investigation. One explanation for the differences might be the effects of time. As the length of time a subject has survived an assault to health increases, the intensity of depression may decrease.

The parameters of depression for coronary heart diseased individuals remains difficult to sort out. This study represented an initial attempt at viewing the interrelating variables. The concept of coronary-prone behavior identifies hyper and hypo responsiveness to stress as part of the pattern. The results of this investigation

indicated that according to the pre-post test differences in JAS scores, no results reached significance and no clear trends were noted. However, those subjects identifed as Type A's did score higher on the SDS depression survey than Type B's. This result is consistent with the conceptual model but interpretation is limited due to the small sample size.

Three Type A individuals made shifts greater than 3.0 standard error points towards Type B behavior and 4 Type A individuals made shifts of greater than 3 points towards increased Type A behavior. These results may reflect that the hyper and hypo responsiveness of coronary-prone behavior pattern occurs in a pattern that is individual to the subject during the course of recovery. These results merit further direct observation of individual responses by the nurse on a time continuum. This study accounted for responses only at entrance into a prescriptive program and after 8 weeks of intervention. The subjects for the study represent a "skewed population" in that they were accepted as stable enough for the prescriptive exercise. No data is available regarding subjects who were not medically stable for the program or who chose not to participate, or those who might have dropped out of the program after 8 weeks. The correlation of variables indicated a relationship between depression scores (DES) and negative life events as well as modified negative life events. A self-reported report bias may have influenced this relationship. The relationship of negative life events and depression is well documented in the literature. The correlation of modified negative life events and negative life events to depression scores is consistent with the conceptual model of this study.

The attribution of uncontrollability and perception of negative or positive life events is one measure of the learned helplessness model of depression. Pre-post test results for negative life events indicate a shift towards less negative perception of negative life events and no change in perception for positive life events. Pre-post test scores of modified negative and positive life event scores indicate no change in perception of control over negative life events and increased perception of control over modified positive life events. The pre-post results are consistent with the conceptual model in relation to modified positive life events, negative life events, and modified negative life events. The lack of change in modified negative life event scores and positive life event scores merits further investigation. It should be noted that the perception of uncontrollability did not increase for either positive or negative events. The study's results are limited in interpretaion due to the small sample size. Changes noted may be due to the intervention of exercise or simply a factor of regression towards the mean in post testing for positive life events, modified negative life events, and modified positive life events.

Attributional assignment of meaning to life events for the purpose of this study was limited to negative or positive perception and controllable or uncontrollable perceptions. As identified by Abramson, et al. (1978) the attribution of helplessness in humans needs to be expanded to include the dimensions of universal vs. personal, stable vs. unstable, and global vs. specific. These dimensions influence expectations and outcomes of helplessness and therefore expectations and outcomes of interventions.

The results of this study indicated that subjects identified

support systems they felt they could count on for aid. All subjects were married. The subjects' projections of the health benefits of the exercise program were positive at both pre and post testing. These factors may have had a strong influence on the low depression scores. The study does indicate that perceptions remain relatively stable throughout treatment.

Though the role exercise played in altering the dependent variables is limited in this study, the shifts seem to indicate that exercise is an important concept to consider in relationship to psychological variables and coronary heart diseased individuals.

Prescriptive exercise programs provide an avenue of rehabilitation for persons suffering from coronary heart disease. As stated by Peterson (1983), persons who suffer CHD or cardiac surgery are already "deconditioned" from a sedontary lifestyle. Hospitalization serves to markedly accelerate the deconditioning process. The accompanying psychological problems associated with a life-threatening disease further serve to impede the healing process.

Anderson (1983) identifies four major psychological goals for cardiac therapy. These include the resolution of situational stressors; secondary prevention to sources of chronic stress; support of reduction methods of other CHD risk factors; and finally, the enhancement of compliance and long-term maintenance of lifestyle changes.

The nursing interventions to achieve therapeutic goals are multidimensional. As stated by Wilson (1981) each individual develops a predominant pathway of stress adaptation. The pathway of adaptation represents a pattern of health behaviors for that individual. According

to Newman (1980) the illness represents the individual's way of expressing the patterned health response. The nursing role should therefore be focused on the identification of health patterns and development of health strategies to meet therapeutic goals. Critical to the identification of health patterns is the on-site observations of clients' behavior. Health strategies of nursing intervention proceed from these observations. For example, nurses would need to observe for clients perceptions of health, predictive attitudes about the intervention, and realistic or unrealistic expectations.

In summary, this study represents an attempt to identify patterns of health in coronary heart diseased individuals as it relates to coronary-prone behavior patterns, depression, life events, and the effects of prescriptive exercise.

Recommendations:

This study provides information useful for several investigations. First, the study should be replicated using a much larger sample size. A larger sample size might reflect changes between the married and unmarried, and include both males and females. The longitudinal design might be expanded to include persons at high risk for coronary heart disease and normals prior to hospitalization for pre testing. The post testing intervals might include data obtained during hospitalization and for regularly scheduled intervals up to two years.

Comparison groups might consist of subjects who receive exercise instruction on an individual rather than group format, and properly matched control group. Instruments might be developed to attend to specific causal attribution and life events. Significant others could be included as a method of validating subjects' perception of their

life. Direct observations and descriptions of patient behaviors are needed to integrate physiological and psychological phenomena.

References

Abramson, L. Y., Seligman, M. E. P., and Teasdale, J. D. Learned helplessness in humans: Critique and reformulation. Journal of Abnormal Psychology, 1978, 87, 49-74.

Akiskal, H. S., and McKinney, W. T. Overview of Recent Research in Depression: Integration of Ten Conceptual Models into a Comprehensive Clinical Frame. Archives of General Psychiatry, 1975, 32, 285-299.

Akiskal, H. S., and McKinney, W. T. Depressive disorders: Toward a unified hypothesis. Science, 1973, 182, 20-29.

Anderson, M.P. Psychological Disorders: Goals, Treatments, and Outcomes. In Peterson, L. H. (ed.), Cardiovascular Rehabilitation: A Comprehensive Approach, New York: MacMillan Publishing Co., 1983.

Antony, W. A. The principles of psychiatric rehabilitation. Baltimore, MD: University Park Press, 1980.

Barchus, J. D., Berger, P. A., Ciaranello, R. P., and Elliott, G. R. Psychopharmacology: From theory to practice. New York: Oxford University Press, 1977.

Beck, A. T. Depression: Clinical, experimental, and theoretical aspects. New York: Harper & Row, 1967.

Beck, A. T., and Shaw, B. F. Cognitive Approaches to Depression, In Handbook of Rational-Emotive Therapy, Ellis, A., and Grieger, R., with contributors. New York: Springer Publishing Company, 1977.

Beck, A. T., Ward, C. H., Mendelson, M., Mock, J. and Erbaugh. An Inventory for Measuring Depression. Archives of General Psychiatry, 1961, 4, 53-63.

Blumenthal, J. A., Williams, R. S., Williams, R. B., and Wallace, A. G. Effects of exercise on type A (coronary-prone) behavior pattern. Psychosomatic Medicine, 1980, 42, 289-296.

Brunner, B. C. Personality and motivating factors influencing adult participation in vigorous physical activity. The Research Quarterly, 1969, 40, 464-469.

Cambell, D. T., and Stanley, J. S. Experimental and Quasiexperimental Designs for Research. Chicago: Rand McNally & Co., 1963.

Chodoff, P. C. The core problem in depression: Interpersonal aspects. Science and Psychoanalysis, 1970, 56-65.

Collingwood, T. R. The effects of physical training upon behavior and self-attitudes. Journal of Clinical Psychology, 1972, 28, 583-585.

Collingwood, T. R., and Willett, L. The effects of physical training upon self-concept and body attitude. Journal of Clinical Psychology, 1971, 27, 411-412.

Connolly, M. B. Life events before myocardial infarction. Journal of Human Stress, 1976, Dec., 3-17.

Depue, R. A., Monroe, S. M., and Shackman, S. L. In The Psychobiology of the depressive disorders: Implications for the effects of stress. Depue, R. A. (Eds.), New York: Academic Press, 1979.

Depue, R. A., and Monroe, S. M. Learned helplessness in the perspective of the depressive disorders: Conceptual and definitional issues. Journal of Abnormal Psychology, 1978, 1, 3-20.

Dohrenwend, B. P. Problems in defining and sampling the relevant Population of Stressful life events. In Dohrenwend and Dohrenwend (Eds.), Stressful life events: Their nature and effects. New York: J. Wiley & Sons, Inc., 1974.

Dohrenwend, B. S., and Dohrenwend, B. P. Stressful life events: Their nature and effects. New York: J. Wiley and Sons, Inc., 1974.

Dreyfuss, F., Shanan, J., and Sharon, M. Some personality characteristics of middle age men with coronary heart disease. Psychotherapy and Psychosomatics, 1966, 14, 1-16.

Engel, G. L. The Biopsychosocial model: Extending the scope of scientific medicine. In Critical Issues in Behavioral Medicine, West, J. L., and Stein, M. (Eds.), New York: J. B. Lippincott Co., 1982.

Erberle, M. Physiological and Psychological effects of a cardiac training program: A clinical investigation. Unpublished thesis, Oregon Health Sciences University, 1978.

Fairbank, D. T., and Hough, R. H. Life event classification and the event-illness relationship. Journal of Human Stress, 1979, Sept., 41-47.

Friedman, M. Pathogenesis of Coronary artery disease. New York: McGraw-Hill, 1969.

Friedman, M., and Rosenman, R. Type A Behavior and Your Heart. New York: Knopf, 1974.

Furrow, M.A. The Development of an Individualized Teaching Booklet For Myocardial Infarction Rehabilitation. Unpublished clinical investigation. Oregon Health Sciences University, 1980.

Glass, D. C. Behavior Patterns, Stress, and Coronary Disease. New York: Lawrence Erlbaum and Assoc., 1977.

Glass, D. C., and Singer, J. E. Urban stress: Experiments on noise and social stressors. New York: Academic Press, 1972.

Griest, J. H., Klein, M. H., Eischeris, R. R., Faris, J., Gurman, A. S., and Morgan, W. P. Running as a treatment for depression. Comprehensive psychiatry, 1979, 20, 41-54.

Griest, J. H., Klein, M. H., Eischens, R. R., Faris, J. W. Anti-depressant running: Running as a treatment for nonpsychotic depression. Behavioral Medicine, 1987, 2, 19-24.

Hackett, T. P., and Cassen, N. H. Psychological intervention in myocardial infarction. In J. P. Naughton & H. K. Hellerstein (Eds.), Exercise Testing and Exercise training in coronary heart disease. New York: Academic Press, 1973, 149-161.

Harvey, D. M. Depression and Attributional Style: Interpretations of Important Personal events. Journal of Abnormal Psychology, 1981, 90, 134-142.

Haskell, W. L. Physical activity after myocardial infarction. American Journal of Cardiology, 1974, 33, 776-783.

Hellerstein, H. D. Exercise Therapy in coronary disease. Bulletin of the New York Academy of Medicine, 1968, 44, 1028-1047.

Holmes, T. H., and Rahe, R. H. The Social Readjustment Rating Scale. Journal of Psychosomatic Research, 1967, 11, 213-218.

Howell, D. P. E., and Alderman, R. B. Psychological determinants of fitness. Canadian Medical Association Journal, 1967, 96, 721-726.

Ismil, A. H., and Trachtman, L. E. Jogging the imagination. Psychology Today, 1973, 6, 79-82.

Jenkins, C. D., Rosenman, R. H., and Zyzanski, S. J. The Jenkins Activity Survey for Health Prediction. Chapel Hill, NC: D. Jenkins, 1965.

Jenkins, C. D., Zyzanske, S. J., Rosenman, R. H., and Cleveland, G. L. Association of Coronary-prone behavior pattern scores with recurrence of coronary heart disease. Journal of Clinic Diseases, 1971, 24, 601-611.

Kostrubala, T. The joy of running. New York: Lippincott, 1976.

Krantz, D. S., Glass, D. C., and Snyder, M. L. Helplessness, Stress level, and the coronary-prone behavior pattern. Journal of Experimental Social Psychology, 1974, 10, 284-300.

Leonardson, G. R. Relationship between self-concept and perceived physical fitness. Perceptual and Motor Skills, 1977, 44, 62.

Lilfefors, I., and Rahe, R. H. An identical twin study of psychosocial factors in coronary heart disease in Sweden. Psychosomatic Medicine, 1970, 32, 523-542.

Looney, J. G., Lipp, M. R., and Spitzer, R. L. A New Method of Classification for psychophysiologic disorders. Amercian Journal of Psychiatry, 1978, 135: 3, 304-308.

Lundberg, V., Theorell, T., and Lind, E. Life changes and myocardial infarction: Individual differences in life change scaling. Journal of Psychosomatic Research, 1975, 19, 27-32.

Lynch, J.J. The Broken Heart: The Medical Consequences of Loneliness. New York: Basic Books, Inc., 1977.

Mann, G. V., Garrett, H. L., Fahi, A., Murray, H., and Billings, F. T. Exercise to prevent coronary heart disease. American Journal of Medicine, 1969, 46, 12-27.

Masuda, M., and Holmes, T. H. Life events: Perceptions and frequencies. Psychosomatic Medicine, 1978, 40, 236-261.

Miller, W. R., Rosellini, R. A., and Seligman, M. E. Learned helplessness and Depression. Maser, J. D., and Seligman, M. E. (Eds.), In Psychopathology: Experimental Models. San Francisco: Freeman & Co., 1977, 104-130.

Morgan, W. P. Physical Fitness and emotional health: A review. American Correct. Therapy Journal, 1969, 23, 124-127.

Morgan, W. P. Physcial working capacity in depressed and non-depressed psychiatric females. American Correct. Therapy Journal, 1970, 24, 14-16.

Morgan, W. P. A pilot investigation of physical working capacity in depressed and nondepressed psychiatric males. Research Quarterly, 1969, 40, 859-861.

Morgan, W. P., Roberts, J. A., Brand, F. R., et al. Psychological effects of chronic physical activity. Journal of Medicine and Science in Sports, 1970, 2, 213-217.

Morgan, W. P., Roberts, J. A., and Flinerman, A. D. Psychological effect of acute physical activity. Archives of Physical Medicine, 1971, 52, 422-425.

Murphy, S. A. Learned helplessness: From concept to comprehension. Perspectives in Psychiatric Care, 1982, 20 1, 27-32.

Newman, M. A. Theory Development in Nursing. Philadephia: F. A. Davis Company, 1979.

Naughton, J., Bruhn, J. G., and Lategota, M. T. Effects of physical training on physiological and behavioral characteristics of cardiac patients. Archives of Physical Medicine, 1968, 49, 131-137.

Ogilvie, B. C., and Tutko, T. A. Sport: If you want to build character, try something else. Psychology Today, 1971, Oct., 61-63.

Omery, A. Phenomenology: a method for nursing research. Advances in Nursing Science, 1983, Jan., 49-63.

Payne, F. E. A practical approach to effective exercise. American Family Physician, 1979, 19, 76-81.

Peterson, L. H. Cardiovascular Rehabilitation: A Comprehensive Approach, Peterson, L. H. (Ed.), New York: MacMillan Publishing Co., 1973.

Rahe, R. H. Life change events and mental illness: An overview. Journal of Human Stress, 1979, Sept., 3-10.

Rahe, R. H., Bennett, L., Romo, M., and Siltanum, P. Recent life changes, myocardial infarction, and abrupt coronary death. Archives of Internal Medicine, 1974, 133, 221-228.

Sarason, I. G., Johnson, J. H., and Siegal, J. M. Assessing the impact of life changes: Development of the Life Experiences Survey. Journal of Consulting and Clinical Psychology, 1978, 46, 932-946.

Schmal, A. H. Discussion of Stress and Copingas Factors in Health and Illness by Lazarus in Psychosocial Aspects of Cancer, Cohen, G., Cullen, J. W., and Martin, L. R., (Eds.), New York: Raven Press, 1982.

Secord, P., and Jorard, S. The appraisal of body-cathexis: Body-cathexis and the self. Journal of Consulting Psychology, 1953, 17, 343-347.

Secunda, S. K., Katz, M. M., Friedman, R. J., and Schnyler, D. Special Reports 1973: The Depressive Disorders. Washington, D.C.: Department of Health, Education and Welfare, Publication No. (ITSM) 73:9157, 1973.

Seligman, M. E. P. Helplessness: On Depression, Development, and Death. San Francisco: W. H. Freeman, 1975.

Seligman, M. E. P., Abramson, L. Y., Semmel, A., and von Baeyer, C. Depressive attributional style. Journal of Abnormal Psychology, 1979, 88, 242-247.

Stern, M. J., Pascale, L., and Ackerman, A. Life adjustment post myocardial infarction. Archives of Internal Medicine, December, 1977, 137, 1680-1685.

Theorell, T. Selected illnesses and Somatic Factors in relation to two Psychological stress Indices - A prospective study on middle-aged contruction building workers. Journal of Psychosomatic Research, 1976, 20, 221-228.

Theorell, T., and Rahe, R. H. Psychological Factors in myocarial infarction: An inpatient study in Sweden. Journal of Psychosomatic Research, 1971, 15, 25-31.

Tillman, K. The Relationship between physical fitness and selected personality traits. The Research Quarterly, 1965, 36, 483-489.

Tinbergen, N. Etiology and Stress Diseases. Science, July, 1974, 24-26.

Vinokur, A., and Selver, M. L. Desirable versus undesirable life events: Their relationship to stress and mental distress. Journal of Personality and Social Psychology, 1975, 32, 329-337.

Wilhelmsen, L., Sanne, H., Emfeldt, D., Grimby, G., Tibblin, G., and Wedel, H. A controlled trial of physical training after myocardial infarction. Preventive Medicine, 1975. 4, 491-508.

Wilson, E. Why Get Sick: A Manuel of Preventive Health Maintenance for Families. Chicago: Nelson Hall, 1981.

Wilson, V. E., Morley, N. C., and Bird, E. I. Mood profiles of marathon runners, joggers and nonexercisers. Perceptual and Motor Skills, 1980, 50, 117-118.

Zion, L. C. The body concept as it relates to self-concept. The Research Quarterly, 1965, 36, 490. 496.

Zung, W. K. The depression status inventory: An adjunct to the self-rating depression scale. Journal of Clinical Psychology. 1972, Oct., 28 (4), 539-543.

Zung, W. K. Factors influencing the self-rating depression scale. Archives of General Psychiatry, 1965, Jan., 12, 63-70.

Zung, W. K., Richards, C. B., and Short, M. J. Self-rating depression scales in an outpatient clinic. Archives of General Psychiatry, December, 1965, (13), 508-515.

Zung, W. K. A self-rating depression scale. Archives of General Psychiatry, January, 1965, (12), 61-70.

APPENDICES

Appendix A

Subject Health Appraisal Form

DATE: _____ IDENTIFICATION NUMBER: _____

I understand that all information obtained will be kept confidential. A code number will be assigned to my questionaire to protect my privacy. This information will be destroyed after the project is completed. Information will be reported in a way that will not identify me with my specific answers.

NAME: _____ MARITAL STATUS: S___ M___ D___ W___

DATE OF BIRTH: day ___ month ___ year ___ PROGRAM: CAPRI _____ METRO Y (jog) ____ (swim) ____

PRIMARY DIAGNOSIS: (if known) _____

1. When were you first diagnosed as having your heart disease? mo _____ year _____

2. When did you first suspect that you had heart disease? mo _____ year _____

3. Approximately how many years of education have you received (for example, completion of high school equals 12 years). _____years of education.

4. How would you rate your health today compared to how you have felt in the past? (Circle appropriate response)
   1. Excellent
   2. Good
   3. Fair
   4. Poor
   5. Don't know

5. How would you rate your health today compared to other people in your age group? (Circle appropriate response)
   1. Excellent
   2. Good
   3. Fair
   4. Poor
   5. Don't know

The following questions focus on your perceptions about family and non-family members in your social network.

6. If needed, how many people do you feel you could count on for concrete aid (such as food, shelter, or clothing)?
   _____ family members
   _____ non-family members

7. If needed, how many people do you feel you could count on for emotional support (such as personal guidance, problem solving, understanding)?

_____ family members
_____ non-family members

8. In the last 2 years, approximately how many clubs or organizations have you actively participated in?

_____ professional
_____ non-professional
_____ religious

9. The following items ask you to make <u>predictions</u> about your life. Please circle the response that best approximates your prediction.

	extremely negative	moderately negative	somewhat negative	no impact	slightly positive	moderately positive	extremely positive
a. Compared to your present health what do you predict your health will be like after completion of the exercise program?	-3	-2	-1	0	+1	+2	+3
b. Compared to other people within your age group, what do you predict your health will be like after completion of the exercise program?	-3	-2	-1	0	+1	+2	+3
c. Compared to your present health, what do you predict your health will be like 6 months from now?	-3	-2	-1	0	+1	+2	+3
d. Compared to other people within your age group, what do you predict your health will be like 6 months from now?	-3	-2	-1	0	+1	+2	+3

Appendix B

Jenkins Activity Survey

Jenkins Activity Survey

C. David Jenkins, Ph.D. Stephen J. Zyzanski, Ph.D. Ray H. Rosenman, M.D.

FORM C

Name (last name first) _____ Age _____ Male ○ Female ○

The *Jenkins Activity Survey* asks questions about aspects of behavior that have been found helpful in medical diagnosis. Each person is different, so there are no "right" or "wrong" answers.

For each question, choose the answer that is true for you, and fill in the space in front of that answer. Use a black lead pencil, and make your marks heavy and dark. Mark only one answer for each question. If you change your mind, erase the old mark completely.

Do not make any stray marks.

1. Do you ever have trouble finding time to get your hair cut or styled?
A○ Never
B○ Occasionally
C○ Almost always

2. How often does your job "stir you into action"?
A○ Less often than most people's jobs
B○ About average
C○ More than most people's jobs

3. Is your everyday life filled mostly by
A○ problems needing a solution?
B○ challenges needing to be met?
C○ a rather predictable routine of events?
D○ not enough things to keep me interested or busy?

4. Some people live a calm, predictable life. Others often find themselves facing unexpected changes, frequent interruptions, inconveniences, or "things going wrong." How often are you faced with these minor (or major) annoyances or frustrations?
A○ Several times a day
B○ About once a day
C○ A few times a week
D○ Once a week
E○ Once a month or less

5. When you are under pressure or stress, what do you usually do?
A○ Do something about it immediately
B○ Plan carefully before taking any action

6. Ordinarily, how rapidly do you eat?
A○ I'm usually the first one finished.
B○ I eat a little faster than average.
C○ I eat at about the same speed as most people.
D○ I eat more slowly than most people.

7. Has your spouse or a friend ever told you that you eat too fast?
A○ Yes, often
B○ Yes, once or twice
C○ No, never

8. How often do you find yourself doing more than one thing at a time, such as working while eating, reading while dressing, or figuring out problems while driving?
A○ I do two things at once whenever practical.
B○ I do this only when I'm short of time.
C○ I rarely or never do more than one thing at a time.

9. When you listen to someone talking, and this person takes too long to come to the point, how often do you feel like hurrying the person along?
A○ Frequently
B○ Occasionally
C○ Almost never

10. How often do you actually "put words in the person's mouth" in order to speed things up?
A○ Frequently
B○ Occasionally
C○ Almost never

THE PSYCHOLOGICAL CORPORATION
A subsidiary of Harcourt Brace Jovanovich, Inc.

Copyright © 1979, 1969, 1966, 1965 by The Psychological Corporation. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the publisher. Printed in the United States of America.
9 174004

11. If you tell your spouse or a friend that you will meet somewhere at a definite time, how often do you arrive late?
A○ Once in a while
B○ Rarely
C○ I am never late.

12. How often do you find yourself hurrying to get places even when there is plenty of time?
A○ Frequently
B○ Occasionally
C○ Almost never

13. Suppose you are to meet someone at a public place (street corner, building lobby, restaurant) and the other person is already 10 minutes late. What will you do?
A○ Sit and wait
B○ Walk about while waiting
C○ Usually carry some reading matter or writing paper so I can get something done while waiting

14. When you have to "wait in line" at a restaurant, a store, or the post office, what do you do?
A○ Accept it calmly
B○ Feel impatient but not show it
C○ Feel so impatient that someone watching can tell I am restless
D○ Refuse to wait in line, and find ways to avoid such delays

15. When you play games with young children about 10 years old (or when you did so in past years), how often do you purposely let them win?
A○ Most of the time
B○ Half the time
C○ Only occasionally
D○ Never

16. When you were younger, did most people consider you to be
A○ definitely hard-driving and competitive?
B○ probably hard-driving and competitive?
C○ probably more relaxed and easygoing?
D○ definitely more relaxed and easygoing?

17. Nowadays, do you consider yourself to be
A○ definitely hard-driving and competitive?
B○ probably hard-driving and competitive?
C○ probably more relaxed and easygoing?
D○ definitely more relaxed and easygoing?

18. Would your spouse (or closest friend) rate you as
A○ definitely hard-driving and competitive?
B○ probably hard-driving and competitive?
C○ probably relaxed and easygoing?
D○ definitely relaxed and easygoing?

19. Would your spouse (or closest friend) rate your general level of activity as
A○ too slow—should be more active?
B○ about average—busy much of the time?
C○ too active—should slow down?

20. Would people you know well agree that you take your work too seriously?
A○ Definitely yes
B○ Probably yes
C○ Probably no
D○ Definitely no

21. Would people you know well agree that you have less energy than most people?
A○ Definitely yes
B○ Probably yes
C○ Probably no
D○ Definitely no

22. Would people you know well agree that you tend to get irritated easily?
A○ Definitely yes
B○ Probably yes
C○ Probably no
D○ Definitely no

23. Would people who know you well agree that you tend to do most things in a hurry?
A○ Definitely yes
B○ Probably yes
C○ Probably no
D○ Definitely no

24. Would people who know you well agree that you enjoy a "contest" (competition) and try hard to win?
A○ Definitely yes
B○ Probably yes
C○ Probably no
D○ Definitely no

25. How was your temper when you were younger?
A○ Fiery and hard to control
B○ Strong but controllable
C○ No problem
D○ I almost never got angry.

26. How is your temper nowadays?
A○ Fiery and hard to control
B○ Strong but controllable
C○ No problem
D○ I almost never get angry.

27. When you are in the midst of doing a job and someone (not your boss) interrupts you, how do you usually feel inside?
A○ I feel O.K. because I work better after an occasional break.
B○ I feel only mildly annoyed.
C○ I really feel irritated because most such interruptions are unnecessary.

28. How often are there deadlines on your job?
A○ Daily or more often
B○ Weekly
C○ Monthly or less often
D○ Never

29. These deadlines usually carry
A○ minor pressure because of their routine nature.
B○ considerable pressure, since delay would upset my entire work group.
C○ Deadlines never occur on my job.

30. Do you ever set deadlines or quotas for yourself at work or at home?
A○ No
B○ Yes, but only occasionally
C○ Yes, once a week or more

31. When you have to work against a deadline, what is the quality of your work?
A○ Better
B○ Worse
C○ The same (Pressure makes no difference.)

32. At work, do you ever keep two jobs moving forward at the same time by shifting back and forth rapidly from one to the other?
A○ No, never
B○ Yes, but only in emergencies
C○ Yes, regularly

33. Are you content to remain at your present job level for the next five years?
A○ Yes
B○ No, I want to advance.
C○ Definitely no; I strive to advance and would be dissatisfied if not promoted in that length of time.

34. If you had your choice, which would you rather get?
A○ A small increase in pay without a promotion to a higher level job
B○ A promotion to a higher level job without an increase in pay

35. In the past three years, have you ever taken less than your allotted number of vacation days?
A○ Yes
B○ No
C○ My type of job does not provide regular vacations.

36. In the last three years, how has your personal yearly income changed?
A○ It has remained the same or gone down.
B○ It has gone up slightly (as the result of cost-of-living increases or automatic raises based on years of service).
C○ It has gone up considerably.

37. How often do you bring your work home with you at night, or study materials related to your job?
A○ Rarely or never
B○ Once a week or less
C○ More than once a week

38. How often do you go to your place of work when you are not expected to be there (such as nights or weekends)?
A○ It is not possible on my job.
B○ Rarely or never
C○ Occasionally (less than once a week)
D○ Once a week or more

39. When you find yourself getting tired on the job, what do you usually do?
A○ Slow down for a while until my strength comes back
B○ Keep pushing myself at the same pace in spite of the tiredness

40. When you are in a group, how often do the other people look to you for leadership?
A○ Rarely
B○ About as often as they look to others
C○ More often than they look to others

41. How often do you make yourself written lists to help you remember what needs to be done?
A○ Never
B○ Occasionally
C○ Frequently

For questions 42-46, compare yourself with the average worker in your present occupation, and mark the most accurate description.

42. In amount of effort put forth, I give
A○ much more effort.
B○ a little more effort.
C○ a little less effort.
D○ much less effort.

43. In sense of responsibility, I am
A ○ much more responsible.
B ○ a little more responsible.
C ○ a little less responsible.
D ○ much less responsible.

44. I find it necessary to hurry
A ○ much more of the time.
B ○ a little more of the time.
C ○ a little less of the time.
D ○ much less of the time.

45. In being precise (careful about detail), I am
A ○ much more precise.
B ○ a little more precise.
C ○ a little less precise.
D ○ much less precise.

46. I approach life in general
A ○ much more seriously.
B ○ a little more seriously.
C ○ a little less seriously.
D ○ much less seriously.

For questions 47-49, compare your present work with your work setting of five years ago. If you have not been working for five years, compare your present job with your first job.

47. I worked more hours per week
A ○ at my present job.
B ○ five years ago.
C ○ Cannot decide

48. I carried more responsiblity
A ○ at my present job.
B ○ five years ago.
C ○ Cannot decide

49. I was considered to be at a higher level (in prestige or social position)
A ○ at my present job.
B ○ five years ago.
C ○ Cannot decide

50. How many different job titles have you held in the last 10 years? (Be sure to count shifts in kinds of work, shifts to new employers, and shifts up and down within a firm.)
A ○ 0-1
B ○ 2
C ○ 3
D ○ 4
E ○ 5 or more

51. How much schooling did you receive?
A ○ 0-4 years
B ○ 5-8 years
C ○ Some high school
D ○ Graduated from high school
E ○ Trade school or business college
F ○ Some college (including junior college)
G ○ Graduated from a four-year college
H ○ Post-graduate work at a college or university

52. When you were in school, were you an officer of any group, such as a student council, glee club, 4-H club, sorority or fraternity, or captain of an athletic team?
A ○ No
B ○ Yes, I held one such position.
C ○ Yes, I held two or more such positions.

STOP. Do not make any marks below this line.

If machine scoring is desired, complete the following information (see Scoring Service Fact Sheet for instructions). Return questionnaire to The Psychological Corporation, Data Services Division, JAS Scoring, 757 Third Avenue, New York, NY 10017.

Identification Code

Mo. Day Year

Indicate desired scoring service:
○ Individual Report Form (Standard Service)
○ List Report and Punched Cards
○ Magnetic Tape

Return report to:

Name (please print)

Address

Billing address:

Name (please print)

Address

Appendix C

Sarason Life Events Survey

Sarason

The Life Experiences Survey

Listed below are a number of events which sometimes bring about change in the lives of those who experience them and which necessitate social readjustment. Please check those events which you have experienced in the recent past and indicate the time period during which you have experienced each event. Be sure that all check marks are directly across from the items they correspond to.

Also, for each item checked below, please indicate the extent to which you viewed the event as having either a positive or negative impact on your life at the time the event occurred. That is, indicate the type and extent of impact that the event had. A rating of -3 would indicate an extremely negative impact. A rating of 0 suggests no impact either positive or negative. A rating of +3 would indicate an extremely positive impact.

	0 to 6 mo	7 mo to 1 yr	extremely negative	moderately negative	somewhat negative	no impact	slightly positive	moderately positive	extremely positive
1. Marriage (wedding)			-3	-2	-1	0	+1	+2	+3
2. Detention in jail or comparable institution			-3	-2	-1	0	+1	+2	+3
3. Death of spouse			-3	-2	-1	0	+1	+2	+3
4. Major change in sleeping habits (much more or much less sleep)			-3	-2	-1	0	+1	+2	+3
5. Death of close family member:									
a. mother			-3	-2	-1	0	+1	+2	+3
b. father			-3	-2	-1	0	+1	+2	+3
c. brother			-3	-2	-1	0	+1	+2	+3
d. sister			-3	-2	-1	0	+1	+2	+3
e. grandmother			-3	-2	-1	0	+1	+2	+3
f. grandfather			-3	-2	-1	0	+1	+2	+3
g. other (specify)			-3	-2	-1	0	+1	+2	+3

	0 to 6 mo	7 mo to 1 yr	extremely negative	moderately negative	somewhat negative	no impact	slightly positive	moderately positive	extremely positive
6. Major change in eating habits (much more or much less food intake)			-3	-2	-1	0	+1	+2	+3
7. Foreclosure on mortgage or loan			-3	-2	-1	0	+1	+2	+3
8. Death of close friend			-3	-2	-1	0	+1	+2	+3
9. Outstanding personal achievement			-3	-2	-1	0	+1	+2	+3
10. Minor law violations (traffic tickets, disturbing the peace, etc.)			-3	-2	-1	0	+1	+2	+3
11. Male: Wife/girlfriend's pregnancy			-3	-2	-1	0	+1	+2	+3
12. Female: Pregnancy			-3	-2	-1	0	+1	+2	+3
13. Changed work situation (different work responsibility, major change in working conditions, working hours, etc.)			-3	-2	-1	0	+1	+2	+3
14. New job			-3	-2	-1	0	+1	+2	+3
15. Serious illness or injury of close family member:									
a. father			-3	-2	-1	0	+1	+2	+3
b. mother			-3	-2	-1	0	+1	+2	+3
c. sister			-3	-2	-1	0	+1	+2	+3
d. brother			-3	-2	-1	0	+1	+2	+3
e. grandfather			-3	-2	-1	0	+1	+2	+3
f. grandmother			-3	-2	-1	0	+1	+2	+3
g. spouse			-3	-2	-1	0	+1	+2	+3
h. other (specify)			-3	-2	-1	0	+1	+2	+3
16. Sexual difficulties			-3	-2	-1	0	+1	+2	+3
17. Trouble with employer (in danger of losing job, being suspended, demoted, etc.)			-3	-2	-1	0	+1	+2	+3

		0 to 6 mo	7 mo to 1 yr	extremely negative	moderately negative	somewhat negative	no impact	slightly positive	moderately positive	extremely positive
18.	Trouble with in-laws			-3	-2	-1	0	+1	+2	+3
19.	Major change in financial status (a lot better off or a lot worse off)			-3	-2	-1	0	+1	+2	+3
20.	Major change in closeness of family members (increased or decreased closeness)			-3	-2	-1	0	+1	+2	+3
21.	Gaining a new family member (through birth, adoption, family member moving in, etc.)			-3	-2	-1	0	+1	+2	+3
22.	Change of residence			-3	-2	-1	0	+1	+2	+3
23.	Marital separation from mate (due to conflict)			-3	-2	-1	0	+1	+2	+3
24.	Major change in church activities (increased or decreased attendance)			-3	-2	-1	0	+1	+2	+3
25.	Marital reconciliation with mate			-3	-2	-1	0	+1	+2	+3
26.	Major change in number of arguments with spouse (a lot more or a lot less arguments)			-3	-2	-1	0	+1	+2	+3
27.	Married male: Change in wife's work outside home (beginning work, ceasing work, changing to a new job, etc.)			-3	-2	-1	0	+1	+2	+3
28.	Married female: Change in husband's work (loss of job, beginning new job, retirement, etc.)			-3	-2	-1	0	+1	+2	+3
29.	Major change in usual type and/or amount of recreation			-3	-2	-1	0	+1	+2	+3

	0 to 6 mo	7 mo to 1 yr	extremely negative	moderately negative	somewhat negative	no impact	slightly positive	moderately positive	extremely positive
30. Borrowing more than $10,000 (buying home, business, etc.)			-3	-2	-1	0	+1	+2	+3
31. Borrowing less than $10,000 (buying car, TV, getting school loan, etc.)			-3	-2	-1	0	+1	+2	+3
32. Being fired from job			-3	-2	-1	0	+1	+2	+3
33. Male: Wife/girlfriend having abortion			-3	-2	-1	0	+1	+2	+3
34. Female: Having abortion			-3	-2	-1	0	+1	+2	+3
35. Major personal illness or injury			-3	-2	-1	0	+1	+2	+3
36. Major change in social activities, e.g., parties, movies, visiting (increased or decreased participation)			-3	-2	-1	0	+1	+2	+3
37. Major change in living conditions of family (building new home, remodeling, deterioration of home, neighborhood, etc.)			-3	-2	-1	0	+1	+2	+3
38. Divorce			-3	-2	-1	0	+1	+2	+3
39. Serious injury or illness of close friend			-3	-2	-1	0	+1	+2	+3
40. Retirement from work			-3	-2	-1	0	+1	+2	+3
41. Son or daughter leaving home (due to marriage, college, etc.)			-3	-2	-1	0	+1	+2	+3
42. Ending of formal schooling			-3	-2	-1	0	+1	+2	+3
43. Separation from spouse (due to work, travel, etc.)			-3	-2	-1	0	+1	+2	+3
44. Engagement			-3	-2	-1	0	+1	+2	+3
45. Breaking up with boyfriend/girlfriend			-3	-2	-1	0	+1	+2	+3

	0 to 6 mo	7 mo to 1 yr	extremely negative	moderately negative	somewhat negative	no impact	slightly positive	moderately positive	extremely positive
46. Leaving home for the first time			-3	-2	-1	0	+1	+2	+3
47. Reconciliation with boyfriend/ girlfriend			-3	-2	-1	0	+1	+2	+3
Other recent experiences which have had an impact on your life. List and rate.									
48.			-3	-2	-1	0	+1	+2	+3
49.			-3	-2	-1	0	+1	+2	+3
50.			-3	-2	-1	0	+1	+2	+3

Appendix D

Modified Life Events Survey

Modified Life Experiences Survey

Listed below are a number of events which sometimes bring about change in the lives of those who experience them and which necessitate social readjustment. These events are exactly the same as the list of events you have rated in the previous Sarason Life Experiences Survey. For your convenience, the occurance of these items has already been checked for you by the researcher. The difference in this survey is that you will be rating your view of control or uncontrollability of each checked life event.

Also, for each item checked below, please indicate the extent to which you viewed the event as being controllable or uncontrollable and the extent of impact on your life. A rating of -3 would indicate extreme uncontrollability of event. A rating of 0 suggests no impact of control or uncontrollability. A rating of +3 would indicate extreme control of event.

	0 to 6 mo	7 mo to 1 yr	extremely uncontrollable	moderately uncontrollable	somewhat uncontrollable	no difference	slightly controllable	moderately controllable	extremely controllable
1. Marriage (wedding)			-3	-2	-1	0	+1	+2	+3
2. Detention in jail or comparable institution			-3	-2	-1	0	+1	+2	+3
3. Death of spouse			-3	-2	-1	0	+1	+2	+3
4. Major change in sleeping habits (much more or much less sleep)			-3	-2	-1	0	+1	+2	+3
5. Death of close family member:									
a. mother			-3	-2	-1	0	+1	+2	+3
b. father			-3	-2	-1	0	+1	+2	+3
c. brother			-3	-2	-1	0	+1	+2	+3
d. sister			-3	-2	-1	0	+1	+2	+3
e. grandmother			-3	-2	-1	0	+1	+2	+3
f. grandfather			-3	-2	-1	0	+1	+2	+3
g. other (specify)			-3	-2	-1	0	+1	+2	+3

	0 to 6 mo	7 mo to 1 yr	extremely uncontrollable	moderately uncontrollable	somewhat uncontrollable	no difference	slightly controllable	moderately controllable	extremely controllable
6. Major change in eating habits (much more or much less food intake)			-3	-2	-1	0	+1	+2	+3
7. Foreclosure on mortgage or loan			-3	-2	-1	0	+1	+2	+3
8. Death of close friend			-3	-2	-1	0	+1	+2	+3
9. Outstanding personal achievement			-3	-2	-1	0	+1	+2	+3
10. Minor law violations (traffic tickets, disturbing the peace, etc.)			-3	-2	-1	0	+1	+2	+3
11. Male: Wife/girlfriend's pregnancy			-3	-2	-1	0	+1	+2	+3
12. Female: Pregnancy			-3	-2	-1	0	+1	+2	+3
13. Changed work situation (different work responsibility, major change in working conditions, working hours, etc.)			-3	-2	-1	0	+1	+2	+3
14. New job			-3	-2	-1	0	+1	+2	+3
15. Serious illness or injury of close family member:									
a. father			-3	-2	-1	0	+1	+2	+3
b. mother			-3	-2	-1	0	+1	+2	+3
c. sister			-3	-2	-1	0	+1	+2	+3
d. brother			-3	-2	-1	0	+1	+2	+3
e. grandfather			-3	-2	-1	0	+1	+2	+3
f. grandmother			-3	-2	-1	0	+1	+2	+3
g. spouse			-3	-2	-1	0	+1	+2	+3
h. other (specify)			-3	-2	-1	0	+1	+2	+3
16. Sexual difficulties			-3	-2	-1	0	+1	+2	+3
17. Trouble with employer (in danger of losing job, being suspended, demoted, etc.)			-3	-2	-1	0	+1	+2	+3

		0 to 6 mo	7 mo to 1 yr	extremely uncontrollable	moderately uncontrollable	somewhat uncontrollable	no difference	slightly controllable	moderately controllable	extremely controllable
18.	Trouble with in-laws			-3	-2	-1	0	+1	+2	+3
19.	Major change in financial status (a lot better off or a lot worse off)			-3	-2	-1	0	+1	+2	+3
20.	Major change in closeness of family members (increased or decreased closeness)			-3	-2	-1	0	+1	+2	+3
21.	Gaining a new family member (through birth, adoption, family member moving in, etc.)			-3	-2	-1	0	+1	+2	+3
22.	Change of residence			-3	-2	-1	0	+1	+2	+3
23.	Marital separation from mate (due to conflict)			-3	-2	-1	0	+1	+2	+3
24.	Major change in church activities (increased or decreased attendance)			-3	-2	-1	0	+1	+2	+3
25.	Marital reconciliation with mate			-3	-2	-1	0	+1	+2	+3
26.	Major change in number of arguments with spouse (a lot more or a lot less arguments)			-3	-2	-1	0	+1	+2	+3
27.	Married male: Change in wife's work outside home (beginning work, ceasing work, changing to a new job, etc.)			-3	-2	-1	0	+1	+2	+3
28.	Married female: Change in husband's work (loss of job, beginning new job, retirement, etc.)			-3	-2	-1	0	+1	+2	+3
29.	Major change in usual type and/or amount of recreation			-3	-2	-1	0	+1	+2	+3

		0 to 6 mo	7 mo to 1 yr	extremely uncontrollable	moderately uncontrollable	somewhat uncontrollable	no difference	slightly controllable	moderately controllable	extremely controllable
30.	Borrowing more than $10,000 (buying home, business, etc.)			-3	-2	-1	0	+1	+2	+3
31.	Borrowing less than $10,000 (buying car, TV, getting school loan, etc.)			-3	-2	-1	0	+1	+2	+3
32.	Being fired from job			-3	-2	-1	0	+1	+2	+3
33.	Male: Wife/girlfriend having abortion			-3	-2	-1	0	+1	+2	+3
34.	Female: Having abortion			-3	-2	-1	0	+1	+2	+3
35.	Major personal illness or injury			-3	-2	-1	0	+1	+2	+3
36.	Major change in social activities, e.g., parties, movies, visiting (increased or decreased participation)			-3	-2	-1	0	+1	+2	+3
37.	Major change in living conditions of family (building new home, remodeling, deterioration of home, neighborhood, etc.)			-3	-2	-1	0	+1	+2	+3
38.	Divorce			-3	-2	-1	0	+1	+2	+3
39.	Serious injury or illness of close friend			-3	-2	-1	0	+1	+2	+3
40.	Retirement from work			-3	-2	-1	0	+1	+2	+3
41.	Son or daughter leaving home (due to marriage, college, etc.)			-3	-2	-1	0	+1	+2	+3
42.	Ending of formal schooling			-3	-2	-1	0	+1	+2	+3
43.	Separation from spouse (due to work, travel, etc.)			-3	-2	-1	0	+1	+2	+3
44.	Engagement			-3	-2	-1	0	+1	+2	+3
45.	Breaking up with boyfriend/girlfriend			-3	-2	-1	0	+1	+2	+3

	0 to 6 mo	7 mo to 1 yr	extremely uncontrollable	moderately uncontrollable	somewhat uncontrollable	no difference	slightly controllable	moderately controllable	extremely controllable
46. Leaving home for the first time			-3	-2	-1	0	+1	+2	+3
47. Reconciliation with boyfriend/ girlfriend			-3	-2	-1	0	+1	+2	+3
Other recent experiences which have had an impact on your life. List and rate.									
48.			-3	-2	-1	0	+1	+2	+3
49.			-3	-2	-1	0	+1	+2	+3
50.			-3	-2	-1	0	+1	+2	+3

Appendix E

Depression Status Inventory

Copyright W. Zung, M.D., 1965, 1974.

All rights reserved.

Reproduced with permission of the author.

THE DEPRESSION STATUS INVENTORY (DSI)

Signs & Symptoms of Depression	Interview Guide for Depression Status Inventory (DSI)	Severity of Observed or Reported Responses: None	Mild	Mod	Sev
1. Depressed mood	Do you ever feel sad or depressed?	1	2	3	4
2. Crying spells	Do you have crying spells or feel like it?	1	2	3	4
3. Diurnal variation: symptoms worst in a.m.	Is there any part of the day when you feel worst? Best?	1	2	3	4
4. Sleep disturbance	How have you been sleeping?	1	2	3	4
5. Decreased appetite	How is your appetite?	1	2	3	4
6. Weight loss	Have you lost any weight?	1	2	3	4
7. Decreased libido	How about your interest in the opposite six?	1	2	3	4
8. Constipation	Do you have trouble with constipation?	1	2	3	4
9. Tachycardia	Have you had times when your heart was beating faster than usual?	1	2	3	4
10. Fatigue	How easily do you get tired?	1	2	3	4
11. Psychomotor agitation	Do you find yourself restless and can't sit still?	1	2	3	4

THE DEPRESSION STATUS INVENTORY (DSI)

Signs & Symptoms of Depression	Interview Guide for Depression Status Inventory (DSI)	Severity of Observed or Reported Responses: None	Mild	Mod	Sev
12. Psychomotor retardation	Do you feel slowed down in doing the things you usually do?	1	2	3	4
13. Confusion	Do you ever feel confused and have trouble thinking?	1	2	3	4
14. Emptiness	Do you feel life is empty for you?	1	2	3	4
15. Hopelessness	How hopeful do you feel about the future?	1	2	3	4
16. Indecisiveness	How are you at making decisions?	1	2	3	4
17. Irritability	How easily do you get irritated?	1	2	3	4
18. Dissatisfaction	Do you still enjoy the things you used to?	1	2	3	4
19. Personal devaluation	Do you ever feel useless and not wanted?	1	2	3	4
20. Suicidal ruminations	Have you had thoughts about doing away with yourself?	1	2	3	4

Appendix F

Self Rating Depression Scale

SELF-RATING DEPRESSION SCALE (SDS)

The following twenty items ask you to rate how you feel. There are no right or wrong answers as each individual feels differently. For each item choose the response that applies to you at this time.

	A Little of the Time	Some of the Time	Good Part of the Time	Most of the Time
1. I feel down-hearted and blue				
2. Morning is when I feel the best				
3. I have crying spells or feel like it				
4. I have trouble sleeping at night				
5. I eat as much as I used to				
6. I still enjoy sex				
7. I notice that I am losing weight				
8. I have trouble with constipation				
9. My heart beats faster than usual				
10. I get tired for no reason				
11. My mind is as clear as it used to be				
12. I find it easy to do the things I used to				
13. I am restless and can't keep still				
14. I feel hopeful about the future				
15. I am more irritable than usual				
16. I find it easy to make decisions				
17. I feel that I am useful and needed				
18. My life is pretty full				
19. I feel that others would be better off if I were dead				
20. I still enjoy the things I used to do				

Appendix G

Informed Consent Form

The Oregon Health Sciences University
School of Nursing

"The Effect of Prescriptive Exercise on Coronary-Prone Behavior Patterns and Depression" by
Judy L. Colligan, R.N., B.S.N.

I_____(Name of Subject)_____ agree to participate in a study of the effect of my prescriptive exercise program on the areas which may be contributing to stress in my life. I understand that this investigation is conducted by Judy Colligan, a graduate student in nursing at the Oregon Health Sciences University School of Nursing under the supervision of Charlotte Markel, R.N., M.S.N.

The participation in the study will include answering four 20-minute questionnaires prior to the initiation of my exercise program. This can be accomplished in a single testing or split testing time. After completion of eight weeks of exercise therapy the questionnaires will again be repeated. While I may not benefit directly from participation in this study, others may be helped by its results. It is my understanding that the result of the study will assist in providing information about prescriptive exercise for the benefit of person with coronary heart disease.

I understand that all information obtained will be kept confidential. Code numbers will be given to each person to protect his or her privacy. This information will be destroyed after the project is completed. Information will be reported in ways that will not identify me with my specific answers.

I will be able to have any questions answered by Ms. Colligan (245-5417) at any time during the project. The results of the study will be made available to the participating agency for my review if I so desire.

I understand I may refuse to participate or withdraw from this study at any time without affecting my relationship with, or treatment at, the participating agency or the Oregon Health Sciences University.

I understand what will be required of me and agree to participate in this study as described above.

Date_____ Signature of Subject_____

Appendix H

Correspondence

June 23, 1983

Ms. Alice Freuler
Dr. Paul Hall
YMCA Cardiac Therapy
2831 S.W. Barbur Blvd.
Portland, OR 97201

Dear Ms. Freuler and Dr. Hall:

This letter is a follow-up to my visit to the YMCA Cardiac Therapy program and a request for consideration of approval of my research project. This study is in partial fullfillment of the requirements for a Master's degree in psychiatric nursing at the Oregon Health Science University, School of Nursing. My thesis committee includes Charlotte Markel, R.N., M.S.N., chairperson, Tim Carmody, Ph.D., and Jo Horsley, Ph.D.

I have enclosed a copy of my proposal for your review. The proposal has been approved by the Human Subjects Committee, Oregon Health Science University.

I am available to meet with you at your convenience to answer any questions you may have concerning the study. Thank you very much for your consideration of this request.

Sincerely yours,

Judy Colligan, R.N./P.M.H.N.P.
Psychiatric-Mental Health
Nurse Practitioner

8116 S.W. 47th Ave.
Portland, OR 97219

(H) 245-5417
(W) 248-5117

June 23, 1983

Ms. Susan Frohnmayer
Dr. John McAnulty
Cardiopulmonary Research Institute
Suite 605
812 S.W. Washington
Portland, OR 97205

Dear Ms. Frohnmayer and Dr. McAnulty:

This letter is a follow-up to my visit to the CAPRI program and a request for consideration of approval of my research project. This study is in partial fullfillment of the requirements for a Master's degree in psychiatirc nursing at the Oregon Health Science University, School of Nursing. My thesis committee includes Charlotte Markel, R.N., M.S.N., chairperson, Tim Carmody, Ph.D., and Jo Horsley, Ph.D.

I have enclosed a copy of my proposal for your review. The proposal has been approved by the Human Subjects Committee, Oregon Health Science University.

I am available to meet with you at your convenience to answer any questions you may have concerning the study. Thank you very much for your consideration of this request.

Sincerely yours,

Judy Colligan, R.N./P.M.H.N.P.
Psychiatric-Mental Health Nurse Practitioner

8116 S.W. 47th Ave.
Portland, OR 97219

(H) 245-5417
(W) 248-5117

July 22, 1983

Professor Irwin G. Sarason
University of Washington
Department of Psychology
Seattle, Washington 98195

Dear Dr. Sarason:

I am a graduate student in Mental Health Nursing at the Oregon Health Science University School of Nursing, Portland, Oregon. I am currently in the process of developing my research proposal for my master's thesis. The topic to be studied is the effects of prescriptive exercise on coronary-prone behavior patterns and depression. This letter is a request for permission to use your Sarason Life Experiences Survey as one of my investigation tools. I am also developing a modification of this tool to test for occurance of life events and subjects perception of control or uncontrollability.

If you have any question regarding my project, feel free to contact me or my advisors, Tim Carmody, PhD. and Charlotte Markel, R.N., M.S.N. Thank you for your consideration of my request.

Sincerely yours,

Judy Colligan, R.N./P.M.H.N.P.
Psychiatric-Mental Health Nurse Practitioner
8116 S.W. 47th Ave.
Portland, Oregon 97219
(w) 503 248-5117

Charlotte Markel, R.N., M.S.W
Dept. of Mental Health Nursing
Oregon Health Sciences Unviersity
3181 S.W. Sam Jackson Park Road
Portland, Oregon 97225
(w) 503 225-7827

Tim Carmody, PhD.
Department of Psychology
Outpatient Department
Oregon Health Sciences University
3181 S.W. Sam Jackson Park Road
Portland, Oregon 97225
(w) 503 225-8613

UNIVERSITY OF WASHINGTON
SEATTLE, WASHINGTON 98195

Department of Psychology NI-25

August 8, 1983

Judy Colligan, R.N./P.M.H.N.P.
Psychiatric-Mental Health Nurse Practitioner
8116 S.W. 47th Ave.
Portland, Oregon 97219

Dear Ms. Colligan:

You have my permission to use the Life Experiences Survey as one of your tools in your research. I would appreciate receiving a report of your findings when your research is finished. Good luck.

Sincerely,

Irwin G. Sarason
Professor

IGS:mc

July 26, 1983

William W. K. Zung, M.D.
Veteran's Administration Hospital
Durham, North Carolina 27705

Dear Dr. Zung:

I am a graduate student in Mental Health Nursing at the Oregon Health Science University School of Nursing, Portland, Oregon. I am currently in the process of developing my research proposal for my master's thesis. The topic to be studied is the effects of prescriptive exercise on coronary-prone behavior patterns and depression. This letter is a request for permission to use your Zung Depression Status Inventory and Self Rating Depression Scale as one of my investigation tools.

If you have any question regarding my project, feel free to contact me or my advisors, Tim Carmody, PhD. and Charlotte Markel, R.N., M.S.N. Thank you for your consideration of my request.

Sincerely yours,

Judy Colligan, R.N./P.M.H.N.P.
Psychiatric-Mental Health Nurse Practitioner
8116 S.W. 47th Ave.
Portland, Oregon 97219
(w) 503 248-5117

Charlotte Markel, R.N., M.S.W
Dept. of Mental Health Nursing
Oregon Health Sciences Unviersity
3181 S.W. Sam Jackson Park Road
Portland, Oregon 97225
(w) 503 225-7827

Tim Carmody, PhD.
Department of Psychology
Outpatient Department
Oregon Health Sciences University
3181 S.W. Sam Jackson Park Road
Portland, Oregon 97225
(w) 503 225-8613

WILLIAM W.K. ZUNG, M.D.
Professor of Psychiatry
Duke University Medical Center

Judy Colligan, R.N./P.M.H.N.P.
8116 S.W. 47th Ave.
Portland, Oregon 97219

Dear Ms. Colligan:

Per your letter of request dated 7/26/83, you have my permission to use my Self-Rating Depression Sclae in your researcy as outlined in your letter, including the Zung Depression Status Inventory.

You will need to include the following information in your manuscript or write-up of your Thesis of Dissertation if the scale is to be included in it:

©W. Zung, MD, 1965, 1974. All Rights Reserved.

Reproduced with Permission of the Author.

Sincerely,

[redacted]

VETERANS ADMINISTRATION HOSPITAL, DURHAM, NORTH CAROLINA 27705, *U.S.A.*
TELEPHONE: 919 286-0411

July 22, 1983

The Psychological Corporation
1001 Polk Street
San Francisco, California 94109

Dear Sirs:

I am a graduate student in Mental Health Nursing at the Oregon Health Science University School of Nursing, Portland, Oregon. I am in the process of developing my research proposal for my master's thesis. The topic to be studied is the effects of prescriptive exercise on coronary-prone behavior patterns and depression. This letter is a request for permission to use the Jenkins Activity Survey (Form C) as one of my investigation tools.

If you have any question regarding my project, feel free to contact me or my advisors, Tim Carmody, PhD. and Charlotte Markel, R.N., M.S.N. Thank you for your consideration of my request.

Sincerely yours,

Judy Colligan, R.N./P.M.H.N.P.
Psychiatric-Mental Health Nurse Practitioner
8116 S.W. 47th Ave.
Portland, Oregon 97219
(w) 503 248-5117

Charlotte Markel, R.N., M.S.W
Dept. of Mental Health Nursing
Oregon Health Sciences University
3181 S.W. Sam Jackson Park Road
Portland, Oregon 97225
(w) 503 225-7827

Tim Carmody, PhD.
Department of Psychology
Outpatient Department
Oregon Health Sciences University
3181 S.W. Sam Jackson Park Road
Portland, Oregon 97225
(w) 503 225-8613

THE PSYCHOLOGICAL CORPORATION
1250 SIXTH AVENUE, SAN DIEGO, CALIFORNIA 92101 (619) 231-6616

August 8. 1983

Judy Colligan. R.N/P.M.H.N.P.
8116 S.W. 47th Ave.
Portland, Or 97219

Dear Ms. Colligan.

We are in receipt of your letter requesting information on obtaining permission to use the Jenkins Activity Survey test.

I am enclosing a Registration Form to be completed and returned to our Qualifications Section in New York. This is necessary prior to ordering our materials.

When ordering, please contact our distribution center directly at (707) 763-1000, 3800 Lakewille Highway. Petaluma, California 94952 and allow 4-6 weeks after receipt of your order. Thank you.

Sincerely,

[redacted]

Nancy Homer, Correspondent
Western Regional Division

/NH

October 3, 1983

Dr. John Doe
Left Ventricle Lane
Portland, Oregon 97219

Dear Sir:

This letter is in regard to a questionnaire study being considered for implementation at the Metro Y heart program. The study is in partial fulfillment of my master's degree in nursing at the Oregon Health Science Center. Dr. Malinow and Dr. Hull of the Metro Y heart program have reviewed and approved the design of the research proposal.

Because this study would involve the voluntary participation of your patients that are referred to the program, a summary of the project is presented for your review. The study is designed to measure the effects of a prescriptive exercise program on 30 adult male clients with coronary heart disease. Major questions addressed include whether the symptoms of depression with this population can be identified and altered, and if the exercise alters coronary-prone (Type A) behavior profiles. This relationship has been suggested in some preliminary research. Individuals volunteering to participate in this study would complete paper and pencil tests prior to the exercise program and again after 8 weeks of exercise.

Participation is completely voluntary and meets all requirements of confidentiality required by the Human Subjects Committee, the Oregon Health Sciences Center. No additional activities are asked of subjects, as the study involves only analysis of the effects of the prescriptive exercise program. This study does not require any participatory or introductory involvement on the part of the referring physician. Data will be collected entirely by me. The results of the study will be provided to referring physicians upon request.

If you have any questions or concerns about this project, you may call me (245-5417), Dr. Carmody (225-8594), or Ms. Charlotte Markel, M.S.N. (225-7827). Since time is of the essence for me, please contact my advisors or me within two weeks. Absence of a response indicates your approval of the study.

Sincerely yours,

Judy Colligan, R.N./P.M.H.N.P.
Nurse Practitioner
8116 S.W. 47th Ave.
Portland, Oregon 97219

Timothy P. Carmody, PhD.
Assistant Professor
Department of Medical Psychology
3181 S.W. Sam Jackson Park Rd.
Portland, Oregon 97201

Charlotte Markel, M.S.N.
Assoc. Prof. of Mental Health Nursing
Oregon Health Science Center
School of Nursing
3181 S.W. Sam Jackson Park Road
Portland, Oregon 97201

AN ABSTRACT OF THE CLINICAL INVESTIGATION OF

JUDY L. COLLIGAN

for the Master of Nursing

Date of Receiving this Degree: June, 1984

Title: THE EFFECTS OF PRESCRIPTIVE EXERCISE ON CORONARY-PRONE BEHAVIOR PATTERNS AND DEPRESSION

Approved:_____

Charlotte Markel, R.N., M.S.N., Clinical Investigation Advisor

The purpose of this investigation was to measure the effects of prescriptive exercise programs on subjects with coronary heart disease. Major questions addressed included whether the parameters of depression in this population could be identified and altered, and if exercise altered coronary-prone behavior profiles.

Subjects included the first 15 voluntary males who had been identified as having coronary heart disease and had agreed to participate in the Portland CAPRI or Metro Y prescriptive exercise programs. Subjects served as their own controls and were pre tested during the first week of their exercise program and post tested after 8 weeks of exercise.

For this investigation, the psychological dependent variables included life events, affective depression symptoms, and coronary-prone behavior profiles. The independent variable was the prescriptive exercise program offered by CAPRI and the Metro Y. Also included in the study were health appraisal and social support system ratings. The

descriptive data was analyzed using means and percentages. The pre-post test results were analyzed using the Paired t test. Inter-relationships between selected variables were evaluated with a Pearson's r and Kendall's tau correlation matrix.

The descriptive data indicated that all subjects identified a support network. Health appraisal results indicated that subjects evaluated their health prior to the program as fairly good and they anticipated and achieved positive results from the exercise program.

Results of the psychological testing indicated that there were minimal signs of depression for this group at pre test and no significant changes noted at post testing. There was, however, a shift at post testing away from depression. No significant differences in pre-post test scores for negative or positive life events, or changes in perceived control was noted for the subjects. However, there was a shift in pre-post test scores towards less negative perception of events, as well as a pre-post test shift towards more control over positive events. The comparison of interrelationships between dependent variables indicated that the Depression Status Inventory (DSI) scores were significantly correlated with negative events and control ratings of negative life events at pre testing. Post test correlations indicated that the DSI scores were again significantly correlated with negative life events.

There were no conclusive findings in regard to the parameters of depression in coronary heart disease. Perceptions, as measured by the dependent variables, remained relatively stable throughout treatment. The learned helplesness model of depression has been closely linked with causal attribution and needs further research in relation to control.