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Illness demands and social support during recovery from a cardiac illness event

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ILLNESS DEMANDS AND SOCIAL SUPPORT DURING RECOVERY FROM A CARDIAC ILLNESS EVENT

by

BERNICE HELEN YATES

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Abstract

Illness Demands and Social Support During
Recovery from a Cardiac Illness Event

by Bernice Helen Yates

Chairperson of the Supervisory Committee: Professor Jeanne Q. Benoliel
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This study was designed to examine the relationships between illness-related stress and change, supportive and nonsupportive marital interactions, and health outcomes for the recovering cardiovascular patient and the spouse. A cross-sectional design was utilized and participants were interviewed approximately two months after the patient had undergone hospitalization and treatment for coronary artery disease. The final sample was comprised of 94 male patients and 85 partners, 83 women and 2 men. Data were analyzed using confirmatory factor analysis (LISREL VI).

The results of this study suggested four main conclusions. First, greater levels of physical recovery outcomes were associated with lower levels of stress for both patients and partners, and with greater levels of physical activity and older age for the patients. Second, greater levels of psychological well-being were associated with four of the same factors for both male patients and their female partners: greater age, less change, less stress, and less partner hindrance. In addition, greater psychological well-being was associated with greater amounts of partner support but only for the patients. Third, greater levels of

relational outcomes were associated with higher amounts of partner support and less partner hindrance. And, for the women, greater relational well-being was associated with less stress. Fourth, in relation to social support, increased partner support was associated with less stress and greater psychological and relational well-being for the patients. In contrast, for the women, increased support from their mates was associated only with greater relational well-being. For both patients and partners, however, a greater perception of nonsupportive exchanges with the mate was associated with more stress and less psychological and relational well-being. Because of the small sample size, the findings are tentative and the study needs to be replicated with an appropriate sample size. Systematically examining the natural helping behaviors of cardiac patients and their partners provided information about the behaviors that were supportive and nonsupportive for both person's health during this time of recovery.

Doctoral Dissertation

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Signature Bernice Yates

Date February 14, 1989

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

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Dedicated to my parents and grandparents

who sacrificed so much for their

children and grandchildren

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Chapter 1

Introduction and Theoretic Framework

The Research Problem and Need for the Study

Recovery from a life-threatening cardiovascular illness proceeds along emotional and relational, as well as physical dimensions (Block, Boyer, & Imes, 1984; Brown & Rawlinson, 1976, 1977; Croog & Levine, 1977; Garrity, 1973). A supportive significant other, often the spouse, probably is one of the most important factors for the patient's adjustment to an illness event (Chowanec & Binik, 1982; LaMendola & Pellegrini, 1979; Sexton & Munro, 1985). This is because the spouse frequently assumes caregiving responsibilities for the patient's treatment plan, life-style changes, and unmet role obligations. However, many spouses, in an attempt to be helpful, may participate in behaviors that are nonsupportive or counterproductive to their mate's recovery (Schafer, McCaul, & Glasgow, 1986; Tilden & Galyen, 1987). Accordingly, this study was designed to consider the role of communicated support from a significant other in the management of illness stress and, further, its impact on outcomes of the recovery process. Particularly, the effect of supportive and nonsupportive interactions with the partner and other close confidants was evaluated in relation to illness-related stress and recovery outcomes for both the ill cardiovascular patient and the spouse.

This study was prompted by several considerations. First, social support warrants attention because, as social beings, humans rely on other humans to provide for many of their needs; and the loss of significant others often has deleterious effects. A criticism of the

social support literature is that little attention has been given to how support works and what its effects are (Lehman, Ellard, & Wortman, 1986). Several theoretical perspectives were integrated to answer the research questions in this study. Stress theory informed this research by postulating that social support is a resource that serves to redress the imbalance between stress and deleterious recovery outcomes (Lazarus & Folkman, 1984). Lin, Dean, and Ensel's (1986) typology of social support guided this research by stating that the maintenance of health requires confiding among intimates who can understand one another's problems and validate the other's sense of worth (Gottlieb, 1983; Shumaker & Brownell, 1984). Uncertainty reduction theory informed this research by stating that individuals are motivated to communicate with one another in order to understand the other's behavior, their own behavior, and the situation (Albrecht & Adelman, 1984, Berger & Calabrese, 1975). Hence, individuals will feel supported if the help they receive results in reducing their stress levels and improving their physical recovery outcomes.

Second, the family environment appears to be an important factor involved in the recovery of cardiac patients; yet most investigators examined only the individual's responses. Coronary heart disease usually affects an individual, 85-90 percent of whom are men, and his or her partner in the prime of their lives, sometime between 50 to 65 years of age (Heart Facts, 1984). This is the time in the couple's life when the children have left home and the marital dyad is most content and peaceful, relative to earlier marital adjustment (Gilford & Bengston, 1979). Although the spouse is frequently the primary source of support

(Adsett & Bruhn, 1968; Chowanec & Binik, 1982; LaMendola & Pellegrini, 1979; Sexton & Munro, 1985), little is known about how much and what types of supportive messages are exchanged when the recovery outcomes vary from positive to negative. Also unclear is how spouse support differs from the support of other close confidants in its association with recovery. Hence, both members of the dyad were examined in this study in relation to how much and what type of help they received, from the partner and from other sources, and how it improved the recovery outcomes of not only the male patient but also the well partner.

Third, bolstering the individual's natural support system may be a target for interventions to improve recovery from illness. To develop theories and strategies for intervention, nurses require more refined distinctions and more qualified statements about the impact of support in specific chronic illness populations. For example, it is yet to be determined what specific types of supportive exchanges are regarded as helpful or unhelpful for an individual experiencing an illness event (Norbeck, 1988; Tilden, 1985; Woods, Yates, & Primomo, in press). Because most outsiders have not experienced the event, they may have misperceptions about how such events impact people. Such misperceptions may, in turn, lead others to offer inappropriate types of support. Hence, one of the main purposes of this research was to examine the types of support that best predict physical, psychological, and relational recovery outcomes.

The rationale for the study is presented in three major sections. The first and second sections contain the literature review and definitions of social support and illness-related stress respectively.

The purpose of these first two sections is to review and critique the literature pertaining to social support and stress and outline the linkages between the underlying latent dimensions and the observed manifest indicators chosen to reflect them. The third major section contains details of the hypothesized linkages between stress, spouse and other support, and recovery outcomes. The purpose of this section is to advance hypotheses between the various dimensions in this theory of adjustment to a life-threatening illness and provide theoretical and empirical data supporting why the dimensions should be linked as hypothesized. Little empirical work has been done on social support in couples in which one member is recovering from a cardiac illness event. Thus, relevant literature from other chronic illness populations is used to advance and defend the major hypotheses linking illness-related change, stress, social support, and recovery outcomes for cardiac patients and their partners. Graphic representation of the hypothesized linkages between the main concepts of this theory of adjustment to a life-threatening illness is depicted in Figure 1. The arrows between the concepts represent the hypotheses or associations among the unobserved elements of stress, support, and recovery outcomes that were tested in this research.

Social Support

Although many investigators studied the effects of social support, few defined it explicitly and investigated it within a theoretic framework. Some definitions were focused on specific aspects of support within the family such as assistance and firm action (Gotay, 1984), or family cohesiveness (Bloom, 1982; Bloom & Spiegel, 1984; Dimond, 1979).

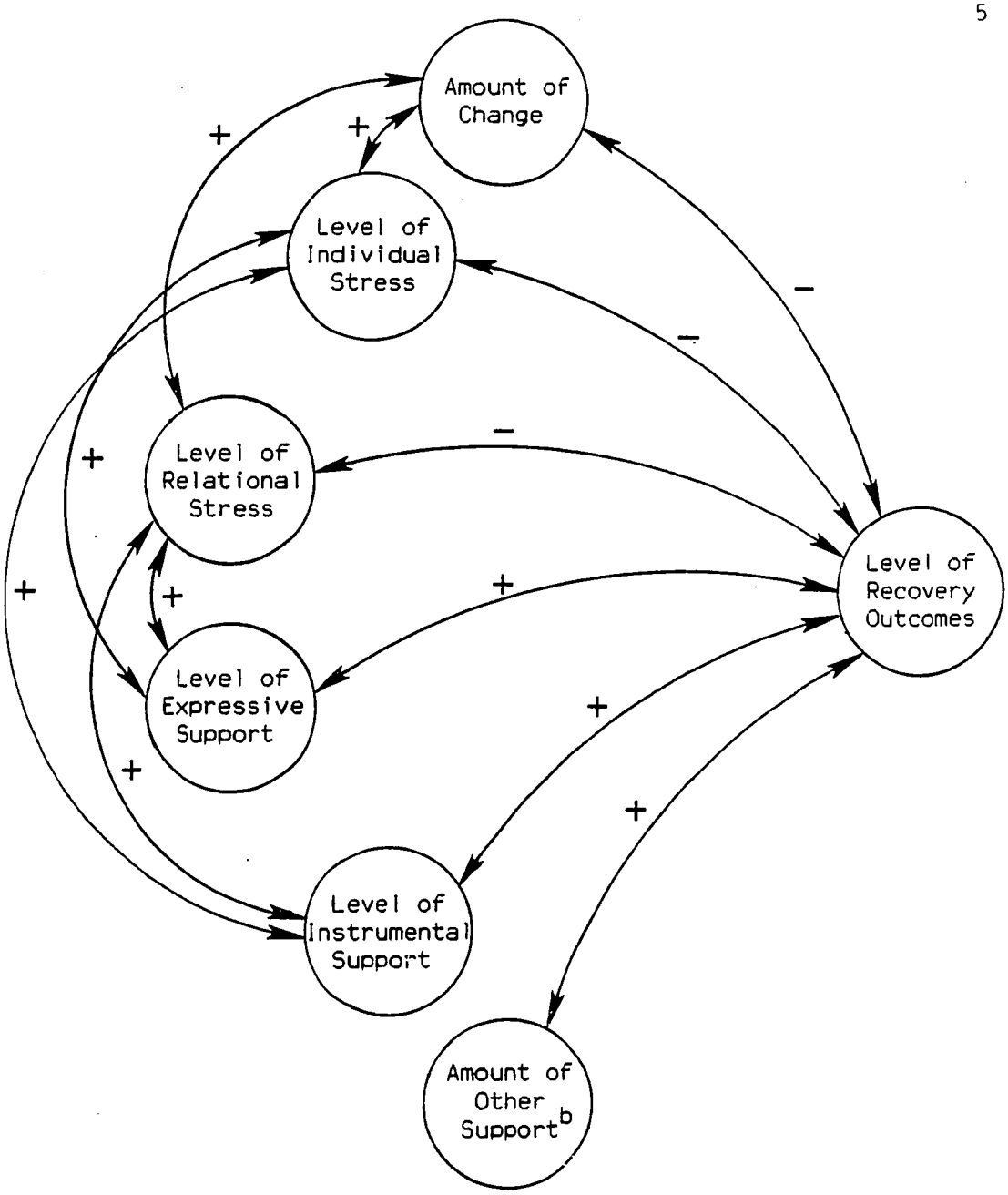


Figure 1. Model of Adjustment to a Life-Threatening Illness[a]

[a]Curved, double-headed arrows indicate nonrecursive relationships.

[b]The strength of the relationships between other support and recovery outcomes is hypothesized to be greater for partners than for patients.

Other definitions were focused on supportive factors outside of the family including access to a confidant (Bloom, 1982; Dimond, 1979) or the amount of social or organizational involvement (Bloom, 1982; Funch & Marshall, 1983; Gotay, 1984). In yet other studies, marital status was used as an index of support (Coyne & DeLongis, 1986; Medalie & Goldbourt, 1976). In contrast, the social support typology of Lin, Dean, and Ensel (1986) was confirmed using panel data from a large community sample, multiple indicators of social support, and causal modeling techniques. Hence, their typology was chosen as the framework for this research.

The essential elements of support are reflected in instrumental and expressive activities (Eggert, 1987; Fiore, Coppel, Becker, & Cox, 1986; Lin, 1986). Instrumental support refers to tangible assistance, and material aid provided by others. In addition, information, advice, and problem-solving communication is included as aspects of instrumental support because of their inclusion in most other definitions of support (Eggert, 1987; House, 1981; Norbeck, 1981; Turner, 1983) and because communicating information is central to facilitating the recovery process. Expressive support refers to esteem building, affectional, affirming, and comfort provisions provided by others (Lin, 1986). Hence, social support was defined as the amount of perceived instrumental, informational, and expressive support supplied by confiding partners and intended to enhance the recipient's well-being (Lin, 1986; Shumaker & Brownell, 1984). Although the individual's community, social networks, and confiding partners are all sources of

support, the present empirical investigation was designed to examine the support primarily from the partner.

Supportive and Nonsupportive Aspects of Social Support

Close relationships that help people manage illness situations generally are characterized by both supportive and nonsupportive interaction patterns, the latter often a source of stress for the couple (Argyle & Furnham, 1983; Coyne & DeLongis, 1986). However, past investigators have operationalized support, somewhat circularly, as only those factors that are beneficial to a person, and a positive correlation between support and well-being is predetermined (Hammer, 1981). Examining both positive and negative aspects of support, investigators found that higher levels of nonsupportive behaviors reduced compliance and metabolic control in diabetics (Shafer et al., 1986) and diminished well-being to a greater extent (Fiore, Becker, & Coppel, 1983; Rook, 1984) than did supportive behaviors. Moreover, support that was offered was viewed as nonsupportive either because it was not the type of help the individual needed (Dunkel-Schetter, 1984; Peters-Golden, 1982) or because the individual's self-esteem was low which, in turn, negatively biased the information (Antonovsky, 1979; Watson & Clark, 1984). Comments about how well the patient looks (Peters-Golden, 1982), attempts to minimize problems, or being told not to worry were perceived as unhelpful (Dunkel-Schetter, 1984). Rook (1984) suggested that because negative interactions are more rare than positive ones, they are more salient when they do occur, and further, that individuals avoid costly interactions as a survival mechanism. From these studies, it was concluded that measuring both positive and

negative elements of support was important. Hence, in this study, an element of support, whether it be instrumental, informational, or expressive, was measured from the individual's perspective as the amount of helping and hindering activities.

Stress of Illness

The Patient's Illness-Related Stress

A stressful situation, such as a cardiac illness event, is often accompanied by a set of unusual demands for both the ill individual and his or her spouse that disrupt an individual's routine activities (Haberman, Packard, & Woods, 1985). The stress of illness refers here to the bothersome or difficult conditions and circumstances that arise during the recovery process. Common sources of stress, termed stressors, include fatigue, physical pain, and difficulty moving around, as well as self-imposed tests of physical capacity, taking new medications (Gilliss, 1984; Stern, Pascale, & McLoone, 1976; Wiklund, Sanne, Vedin, & Wilhelmsson, 1984), symptom monitoring, dependency, work, and existential concerns (McCorkle & Benoliel, 1983). Three sources of stress, perceived as most intense, are symptoms of the illness, treatment and life-style changes, and preparing for an uncertain future--finding meaning or purpose in life and cutting back and managing losses (Hutton, Wolfer, Elster, & Rolando, 1984). The first month after hospital discharge is viewed as particularly difficult for a majority of patients with the difficulty steadily declining through the sixth month of the illness (Jenkins, Stanton, Savageau, Denlinger, & Klein, 1983). In sum, sources of stress for the patient center around the symptoms of the illness, treatment and life-style

changes, relinquishing usual roles and activities to assume a dependency role, and preparing for an uncertain future.

The Partner's Illness-Related Stress

Several investigators proposed that spouses of cardiac patients experience illness-related stress that is similar if not greater than those of their mates following an acute illness event (Adsett & Bruhn, 1968; Gilliss, 1985; Segev & Schlesinger, 1981; Skelton & Dominian, 1973: Stern & Pascale, 1979; Wishnie, Hackett, & Cassem, 1971). Frequently reported sources of stress for spouses during the first six months after the illness event were the responsibility for care, managing the patient's pain, anticipating needs, conflicts over the meaning of the physician's instructions, altered eating habits (Gilliss, 1984), worry over the mate developing problems or overextending, and uncertainty about the husband's future health status (Bramwell & Whall, 1986; Gilliss, 1984). Additional concerns of spouses, during the first year of the husband's convalescence from a myocardial infarction (MI), were handling the husband's depression/moods, handling their own feelings of frustration and anger, and uncertainty related to sexual activity (Adsett & Bruhn, 1968; Nyamathi, 1987).

There is a theme in the literature that spouses' anxieties are a response to a lack of knowledge about what to expect and how to help their husbands. Bramwell and Whall (1986) found that the more confident the wife was with her role performance, the lower the husband's anxiety level. Spouses who had difficulty providing support, approximately 20% of the sample, had problems not only because of their own anxieties, but also because of a lack of knowledge about how to help, husbands not

sharing their concerns, or preexisting marital problems (Bramwell, 1986; Bramwell & Whall, 1986). Croog and Fitzgerald (1978) reported that highly stressed women had husbands who were either rehospitalized for cardiac complications, reported marital unhappiness or emotional volatility, had a college education, and came from an ethnic Italian background. In contrast, wives reporting the least distress continued to enjoy their jobs, maintained leisure activities, and reported satisfactory marriages (Mayou, Foster, & Williamson, 1978).

During the acute phase of the crisis of MI, spouses seemed so engrossed in caring for their mates that they tended to ignore or minimize their own health (Dhooper, 1983). Approximately one month later, the initial high levels of anxiety were seen in reactive illnesses (Dhooper, 1983). In several studies, 40 to 65 percent of the spouses reported new or previous symptoms or illness (Hentinen, 1983; Jacobson & Eichhorn, 1964; Nyamathi, 1987; Skelton & Dominion, 1973). Greater than 40 percent of the spouses suffered prolonged physiologic and psychologic distress as long as one year after their husband's MI (Nyamathi, 1987). The psychosomatic complaints centered around sleep, appetite, bowel disturbances, and heart palpitations. In sum, sources of demands for the spouses center around the caregiver role--its responsibilities and frustrations--and uncertainties related to the illness--the patient's future health status and their interpersonal relationship. From these studies, it can be concluded that patients and spouses share some similar stresses yet experience unique ones. Unique stresses for the patients are primarily symptoms of the illness and treatment changes. Unique stresses for the spouses are mainly the

responsibilities and frustrations of the caregiver role. Both patients and spouses appear to experience uncertainty about the patient's future health status and changes in their marital relationship in addition to stress from life-style changes.

Dimensions of Illness-Related Stress

From prior research, it appears that there are two broad areas that depict stress and are considered in this model, namely individual and relational illness stress. Individual illness-related difficulties for both the patient and his partner include: a) physical symptoms (although a result of different factors), b) uncertainty about the patient's future health status, and c) life-style changes especially if the wife adopts the same changes. Likewise, relational difficulties include: a) resuming sexual activity, b) dependency and self-image issues, and c) income, family, and work role changes. Finally, the measurement of illness stress is reflected by how bothersome or difficult each one is perceived to be.

Stress and Change

The recovery period is a time when substantial processes of stress and change are taking place and individuals are attempting to come to terms with not only the life-threatening nature of the illness but also the pain, fatigue, life-style changes, changes in body image, and uncertainty about the future (Byrne, 1982). It is frequently assumed, but empirically untested, that a number of behavioral changes in a short time, positive or negative, are inherently stressful because they may overwhelm the individual's ability to manage the situation (French, Rodgers, & Cobb, 1974; Holmes & Rahe, 1967; Sarason, Johnson, & Siegel,

1978). Further, Thoits (1986) argued that changes that are viewed negatively result in worsening psychological outcomes whereas changes that are viewed positively have a minor impact on psychological distress. Zyzanski and associates (1981) examined changes unique to cardiac patients and reported that patients with greater negative emotional and social outcomes cited specific undesirable changes from which these outcomes resulted. Because an individual may experience a life-style change and not consider the change stressful, the amount of change was delineated as a separate dimension within this model. The measurement of change was operationalized as the behavioral readjustments the person had made and the amount of increase or decrease in that behavior. Although there is minimal empirical data about the relationship between change and stress levels, it seems that the greater the behavioral readjustments or amount of change, the greater the potential depletion of the individuals' physical and psychological resources for adjustment; and, in turn, the greater the person's stress levels. Hence, the following hypothesis was tested:

H1: The amount of perceived change for both the patient and the partner associates positively with both the individual and relational levels of stress.

Stress and Type of Support Needed

To manage the stress of illness, the ill person may have greater than average needs for various forms of social support (Eckenrode, 1983; Wortman & Conway, 1985). Hobfall and Walfisch (1984) suggested that instrumental support is not called into play until individuals are unable to perform their usual roles and activities. For example, illness symptoms, such as fatigue or pain, may restrict the patient from

routine activities of daily living, and in turn, necessitate additional help from the spouse during the convalescent period (instrumental support). It was theorized that individual illness stress, such as symptoms and life-style changes for which practical assistance is required, would generate instrumental support activities moreso than expressive support (Gottlieb, 1985; Pearlin & Aneshensel, 1986; Wethington & Kessler, 1986).

In contrast, concerns about an uncertain future and/or interpersonal demands are more likely to set in motion expressive support activities. In MI patients, complete relief from angina associated significantly with aspects of illness behavior, particularly high responsiveness to reassurance and low interpersonal discord (Pilowsky, Spence, & Waddy, 1979). Receiving messages of love and acceptance from another person should be relevant for a wide variety of stressors because feeling loved and accepted appears to counteract threats to self-esteem (Wills, 1985).

There are two competing views in relation to the effect of social support on health outcomes (Albrecht & Adelman, 1987; Eggert, 1987; Lin, 1986). First, social support exerts a direct, positive influence on recovery outcomes independent of illness stress. Second, the predominant view, social support buffers possible detrimental effects from stress on recovery outcomes (see Lin, Dean & Ensel, 1986 for a review). The main difference between the two models is that, in the main effects model, social support acts to improve recovery outcomes regardless of stress levels, whereas in the buffering model, the effects of stress and support on health are interactive. That is, the

beneficial effects of support on recovery outcomes become increasingly evident as stress levels increase. Within this study, the cardiac illness event was assumed to give rise to the various illness stresses and preceded the provision of support during the recovery period. This assumption guided the development of the following hypotheses, even though the causal paths cannot be determined fully because of the cross-sectional study design. The following hypotheses were tested:

H2: The level of illness stress associates positively with the level of partner instrumental and expressive support (for both the patient and partner).

H3: The level of individual illness stress associates positively with the level of partner instrumental support moreso than with partner expressive support.

H4: The level of relational illness stress associates positively with the level of partner expressive support moreso than with partner instrumental support.

Recovery Outcomes

The nature and assessment of a complete and positive recovery are of major concern to health care providers. For cardiovascular patients, recovery typically has been assessed either through employment status (Burgess, Lerner, D'Agostino, Vokonas, Hartman, & Gaccione, 1987), relief of angina (Pilowsky et al., 1979), quality of life (Brown, Rawlinson, & Hilles, 1981; Cass Principal Investigators & Associates, 1983; Kornfeld, Heller, Frank, Wilson, & Malm, 1982; LaMendola & Pellegrini, 1979; Penckofer & Holm, 1984), or functional status (Bruce, Bruce, Hossack, & Kusumi, 1983; O'Connor, 1983; Radley & Green, 1985). No one variable offered a very comprehensive view of the patient's adjustment. Although several investigators documented that patients achieved a satisfactory quality of life or recovery following a cardiac

illness event (Jenkins et al., 1983; Kornfeld et al., 1982; LaMendola & Pellegrini, 1979; Penckofer & Holm, 1984), the quality of life concept lacks a consensual definition in the literature and few predictors of improvement are documented consistently across studies. Furthermore, there is minimal information about the immediate convalescent period.

Within this study, to account for these past weaknesses, outcomes of the recovery process refer to a multidimensional assessment of the individual's physical, psychological, and relational dimensions of functioning. In addition, the person's own theory of life quality is considered by assessing the individual's achievement of his/her own plans and goals in each of these areas (Cohen, 1982; Newton & Killien, 1986). Examining these three areas of functioning is an attempt to view the person from an holistic perspective even though the areas must be separated first into parts. The indicators of each of the three categories of recovery outcomes warrant specific explication in how they are related to illness change, stress, and social support.

Amount of Change and Recovery Outcomes

For participants experiencing a lot of change, one would expect to see a change in their reported recoveries. For example, changes in lifestyle such as adopting an exercise program or reducing fats and cholesterol in the diet, should be linked with improved health. Patients and partners make life-style changes to diminish the likelihood of heart disease and, ultimately, to extend their lives. Even relational changes, such as reducing family role involvements, are made initially to allow time for healing and recuperation. Hence, it seems

plausible that people's perception of change should show up in their health assessments because at least cognitively they should be linked.

One could theorize that changes, either increases or decreases in behaviors, would deplete the individual's physical and psychosocial resources for managing the change, leaving the individual more vulnerable to exacerbation of the concurrent illness or to a new illness. Based on this line of reasoning the following hypotheses were tested for both the patient and partner:

H5: The amount of illness-related change associates negatively with physical recovery outcomes.

H6: The amount of illness-related change associates negatively with psychological recovery outcomes.

H7: The amount of illness-related change associates negatively with relational recovery outcomes.

Illness Stress and Recovery Outcomes

Physical Recovery. Several investigators operationalized physical recovery as functional status or the level of activities the individual is able to do (Bruce et al., 1983; Driever, 1985; Radley & Green, 1985). Some investigators found that less stress was associated with improvement in functional status (Gortner, Gilliss, Moran, Sparacino, & Kenneth, 1985; Soloff, 1978). On the other hand, other investigators reported that patients experiencing less stress did not report greater functional status but rather a greater acceptance of the illness in spite of physical impairments and decreased activity levels (Bruce et al., 1983; Radley & Green, 1985; Ramshaw & Stanley, 1981). In fact, patients who reported the highest activity levels also reported the poorest life satisfaction, more angina, and felt overwhelmed by the

illness (Radley & Green, 1985). Implicit in a greater acceptance of the illness may be persons' abilities to reconcile how much they are able to do versus how much they think they should be doing at a given recovery point. Physical recovery outcomes, therefore, are more than just the level of postoperative activity and involve the fit between the individual's expected and achieved physical capacity and goals.

Other factors that reflect the individual's physical recovery outcomes include the presence and intensity of angina, the individual's level of conditioning or training, and the pumping action of the heart muscle (Gortner et al., 1985; Rigotti, Thomas, & Leaf, 1983). With increases in activities, persons with the above conditions, as compared to persons without coronary artery disease, do not have the same physiological capacity to respond to the body's need for increased blood flow (Bruce et al., 1983). After surgery, patients who did not report relief from angina were either more likely to feel overwhelmed by the illness (Radley & Green, 1985), to evaluate current and future health status more negatively, or to report more overall health concerns (Driever, 1985). Those patients whose goals of surgery were not realized were more likely to report more severe preoperative angina or to experience cardiac and/or noncardiac morbid events associated with the surgery (Gortner et al., 1985). Hence, manifest indicators of physical recovery outcomes include the person's subjective perspective of his/her: (a) level of physical health, (b) level of tasks, (c) satisfaction with activity level, (d) level of heart condition, and (e) capacity to achieve the goals of physical functioning after the illness. Indicators from an objective perspective included the individual's

weekly activity level and left ventricular function (cardiac catheterization and treadmill data).

Either member of the couple might place unrealistic relational demands on the other member in an attempt to be helpful. For example, patients might expect their partners to provide unrealistic levels of care for the partner or to do things for them that they could do themselves. On the other hand, partners might restrict unnecessarily the patients' activity levels and hence foster physical dependency. Both of these examples are instances where greater relational stresses might have the potential to link with lower physical health outcomes for both members of the dyad. Hence, it was hypothesized that:

H8: The level of individual and relational stress levels associates negatively with physical recovery outcomes.

Psychological Recovery. It appears that the majority of patients achieved normal levels of anxiety and depression by six months post hospitalization but that roughly one-third of the patients continued to experience some degree of affective disturbance (Jenkins et al., 1983; Kornfeld et al., 1982; Soloff, 1978). The greatest negative impact on emotional adjustment occurred in patients who, in the first postoperative year, either were hospitalized for cardiac or noncardiac reasons, had continuing intense chest pain, reported illness uncertainty and treatment demands (Thurer, Levine, & Thurer, 1980), had more than three sick days during the past month, or were forced into retirement (Zyzanski et al., 1981). Mishel (1983; 1984) also found that illness uncertainty or vagueness about the prognosis and severity of the illness was associated with problems in psychosocial adjustment for cardiac

patients. When illness uncertainty was present, the individual's ability to define the situation was hampered and actions chosen to manage the future were limited resulting in psychological distress (Mishel, 1984).

Cardiac surgery patients whose current outlook was one of frustration and unrealized expectations reported significantly more feelings of anxiety, depression, and discouragement (Radley & Green, 1985; Zyzanski et al., 1981). If individuals experience doubts or difficulties about their capabilities for family and work roles and changing important risk factors, this circumstance is likely to influence their self-perception, erode self-esteem, and worsen anxiety and depression. In prior research on cardiac patients, lower levels of anxiety and depression correlated with higher levels of with self-esteem (Dracup, 1983; Driever, 1985). Because self-esteem was heavily influenced by cognitive perceptions and mood state within the individual (Gottlieb, 1985), it was utilized along with anxiety, depression, and psychological goals achieved as indicators of psychological recovery outcomes. Hence:

H9: The level of individual and relational illness stress associates inversely with psychological recovery outcomes.

Relational Recovery Outcomes. During the immediate convalescent period, ill persons are unable to care for themselves and become dependent on informal caregivers, generally partners, to meet their needs (Corbin & Strauss, 1984). If individuals view this negatively and experience stress about not being able to fulfill either their activities of daily living or their family and work role obligations,

one would expect this stress to influence stresses and strains in other areas of their lives such as the dyad's relational adaptability and cohesion. Significant interpersonal problems appear to result for approximately 25 percent of the participants after a life-threatening illness event (Dunkel-Schetter, 1984; Jenkins et al., 1983; Mayou et al., 1978; Skelton & Dominion, 1973). Patients experiencing the most negative changes in interpersonal relations with the spouse, family, and coworkers were individuals reporting forced retirement, those with higher educational levels (Zyzanski et al., 1981), and those with greater levels of angina (Bradford, 1981). In addition, the illness context results in greater relational uncertainty because of difficulties in relating to one another in a changed and new situation (Albrecht & Adelman, 1984). During the time it takes the couple to renegotiate the family roles, rules, and expectations and resolve the stressors produced by changes in relational factors, relational well-being is hypothesized to be strained and at a lower level than usual. Hence, manifest indicators of relational outcomes include satisfaction with relational adaptability and cohesion, and relational commitment, equity, and goal attainment.

H10: The levels of individual and relational illness stress will associate inversely with relational recovery outcomes.

Expressive Support and Recovery Outcomes

Social support becomes very important as a demanding illness situation unfolds because support is one of the mechanisms through which stress can be reduced and a positive sense of well-being can be maintained. Pearlin and Aneshensel (1986) hypothesized that expressive

support would be most effective for controlling anxiety and depression because it legitimizes the other person's feelings and affirms personal worth. Conversely, if the couple does not communicate thoughts and feelings about the illness freely, a sense of worthlessness may be conveyed which, in turn, may lead to increased depression and humiliation (Fournet & Schaubhut, 1983).

Expressive support from the family was related significantly to improved well-being for women with advanced breast cancer (Bloom & Spiegel, 1984; Dunkel-Schetter, 1984; Funch & Mettlin, 1982), greater activity levels in cardiac patients (Driever, 1985), greater metabolic control for diabetic women (Edelstein & Linn, 1985; Heitzmann & Kaplan, 1984), and greater self-esteem (Dunkel-Schetter, Folkman, & Lazarus, 1987). Funch and Mettlin (1982) also found that physician support, one element of which was expressive, was related significantly to psychological recovery from breast cancer. Moreover, the greater the satisfaction with partner support postpartum, the greater the intimacy with the spouse (Hobfoll, Nadler, & Lieberman, 1986). The opposite side of these findings was that if the husband was unable to offer support for his spouse postmastectomy, women reported greater distress when compared to women with supportive husbands (Peters-Golden, 1982).

In contrast to the positive impact of support on well-being, Cutrona (1986) found that listening to confidences actually worsened depression in a college sample. Similarly, higher levels of partner support were associated with less physical activities for cardiac patients (Hilbert, 1986) and less metabolic control for diabetic men (Heitzmann & Kaplan, 1984). These conflicting data might have resulted

for many reasons. In the first study, students who had someone listening to their confidences might have reported more depression because the concern and attention was rewarding and allowed them to wallow further in their distress. In the next two studies cited, the level of support was evaluated for its association with illness compliance factors. Coates and Wortman (1979) suggested that the likelihood of a boomerang effect increases with the extent to which the helper wants to control the behavior and moods of the recipients of help, rather than helping others regain control of their own circumstances. Other explanations for conflicting associations between support and well-being include the timing of support, who the confidant is, the context of the situation, and the match between desires and needs for support and what is received (Albrecht & Adelman, 1984; Belle, 1987; Cohen & McKay, 1984; Jacobsen, 1986). Finally, some recipients may recognize their need for help and accept it, yet still identify themselves as dependent, needy and thus, feel badly about themselves (Shumaker & Brownell, 1984).

Although the research findings on the relationship between expressive support and recovery outcomes are mixed, it would seem that expressive support would serve to restore and maintain the individual's self-identity, physically, psychologically, and in relation to others, especially when it has been changed and potentially threatened by an illness situation (Cohen & McKay, 1984; Nuckolls, Cassel, & Kaplan, 1972; Wills, 1985). Through expressive support, the individual provides messages of love and affection, reaffirms the partner's worth and value, and reinforces the relational commitment. Related to the illness and

its associated hardships, expressive support is a resource that attempts to restore the imbalance between stress levels and recovery outcomes by providing a listening and understanding confidant for what the other person is experiencing, by providing encouragement when needed, and by providing messages that the individual is still loved and accepted in this new set of circumstances for the couple. Specifically:

H11: The amount of expressive support from the partner associates positively with psychological recovery outcomes.

H12: The amount of expressive support from the partner associates positively with physical recovery outcomes.

H13: The amount of expressive social support from the partnerassociates positively with relational recovery outcomes.

Instrumental Support and Recovery Outcomes

Research findings linking instrumental support and recovery outcomes are inconclusive also. Dunkel-Schetter (1984) found that, in general, with greater instrumental support, cancer patients reported more positive levels of affect and self-esteem. Similarly, material aid was associated with physical recovery from breast cancer surgery (Funch & Mettlin, 1982). In contrast, Funch and Marshall (1984) found that the availability of support was negatively related to adjustment for self-reliant women with breast cancer ($r=-.20$, $p<.05$). These women were bothered by offers of assistance especially if it was an activity that they preferred to do and were able to do themselves. Hyman (1971) reported that perceived preferential treatment increased perceived disability in a sample of individuals with a variety of chronic illness conditions.

Information and advice, when provided by family and friends, was perceived as unhelpful by cancer patients (Dunkel-Schetter, 1984). In addition, although information was more helpful coming from professionals rather than family and friends, the information needed to be provided in an emotionally supportive manner (Dunkel-Schetter, 1984). However, instrumental and informational partner support was hypothesized to improve recovery outcomes because support is offered as a resource during a time of recovery when the illness potentially has depleted the person's resources for managing physical, psychological, and relational recoveries. If, for example, adopting an exercise program is stressful, it is likely to aid the person's recovery to hear information about exercise--"to gradually increase the time and intensity of the exercise"--and/or to receive tangible assistance--"to have someone accompany the person during the exercise". Similarly, the partner's physical, psychological, and relational resources for managing the illness situation will not be depleted if she is supplied with greater informational and instrumental support from the patient. With more aid and information the partner will have a greater understanding of the illness event, there will be more opportunities to negotiate new relational roles and rules and appropriate activity levels, and less chance for misperceptions and conflicts over what the physician's instructions were. If these factors are not addressed, lower levels of psychological and relational well-being might result. Hence:

H14: The level of instrumental and informational partner support demonstrates a positive relationship with physical recovery outcomes for both members of the dyad.

H15: The level of instrumental and informational partner support demonstrates a positive relationship with psychological recovery outcomes for both members of the dyad.

H16: The level of instrumental and informational partner support demonstrates a positive relationship with relational recovery outcomes for both members of the dyad.

Difference Between Patient and Spouse Adjustment Models

Marital Differences in Support

Past empirical findings suggest that husbands appear to have a slight marital advantage than do wives in that more husbands reported having appreciative, affirming, affectionate, and reciprocating spouses (Vanfossen, 1981). However, men generally rely solely on their spouses for support whereas women have more extensive and varied networks than men (Antonucci, 1985). Antonucci and House (cited in Antonucci, 1985) found that women reported both providing and receiving more support than men and to be influenced positively by the provision of support. In a like manner, diabetic men perceived more support from their spouses than diabetic women (Ahlfield, Soler & Marcus, 1985). Men with better outcomes from MI, in relation to resuming former work activities and spouse perception of the illness as over, had wives who reported receiving help from more sources during the first year of the illness (Finlayson, 1976). Hence, one of the main differences between the ill individual and his partner in the source of support appears to be that the ill person is receiving most of his support from his partner whereas the well partner is receiving support primarily from others outside the couple. For these reasons, the following hypotheses were advanced:

H17: The patient's perception of expressive and instrumental partner support demonstrates a stronger positive association with recovery outcomes than the level of support from other sources.

H18: The partner's perception of expressive and instrumental support from other sources demonstrates a stronger positive association with recovery outcomes than the level of support from the patient.

Impact of Differences in Marital Support on Recovery

Although the spouse may be contributing more to the relationship during the patient's recovery period, in long-term relationships there is an increased tolerance to perceived inequity given the couple will have ample time to resolve the inequity (Hatfield, Utne, & Traupmann, 1979; Huston & Burgess, 1979). However, if the relationship was in trouble prior to the illness, both partners become concerned about equity and are more likely to report dissatisfaction with the relationship. The marital relationships of cancer patients with a poor prognosis changed from being mutually supportive to ones in which the wives did the supporting and got little in return (Oberst & James, 1985). These wives reported that their husbands virtually were unaware of the wives' concerns which, in turn, increased their psychological distress (Oberst & James, 1985). Sexton and Munro (1985) found that 33% of the couples in which one member had a chronic illness shared their problems whereas 70% of nonillness spouses shared problems with their husbands. Emotional support from the family was the most frequently used form of support, moreso than information or aid, and led to significant dietary changes in hypertensive patients (Baranowski, Nader, Dunn, & Vanderpool, 1982). For supportive activities to be perceived as supportive, whether tangible aid, information, or expressive support,

they need to be provided in an emotionally supportive manner (House, 1981). Hence, the one kind of support that the ill person is likely to provide the well partner, if any, is expressive support or messages of love, affirmation, and commitment. These messages from the partner may be adequate to sustain the spouse if she feels that equity will be restored at a future point in the relationship and if she needs and is provided with instrumental support from outside the couple. Specifically, the following hypothesis emerged:

H19: The partner's perceived level of expressive support from the patient, moreso than instrumental support, will associate positively with the partner's physical, psychological, and relational recovery outcomes.

Nursing Implications

Although achieving a satisfactory recovery is a pertinent problem in the care of cardiovascular patients, nurse scientists have not focused extensively on testing models of recovery. Nursing as a discipline is concerned with the diagnosis and treatment of human responses to health and/or illness (American Nurses Association, 1980). By examining systematically the natural helping behaviors exchanged within the marital dyad, a better understanding of the behaviors that are supportive or nonsupportive to both the patient's recovery and the partner's well-being can occur. This understanding may, in turn, enable nurse scholars to develop nursing therapies aimed at providing an efficacious type of support and bolstering the individual's support system. In addition, knowledge of the predictors of both positive and negative recovery outcomes is vitally important for planning and testing specific nursing therapies aimed at improving recovery outcomes.

Statement of Purpose

The purpose of this research was to examine associations between illness-related change, stress, and various types of support in relation to physical, psychological, and relational recovery outcomes. In particular, the levels of perceived change, individual and relational stress, and instrumental, informational, and expressive support were examined in relation to patient's and partner's recovery outcomes. The overall hypothesis of this study was that partner support is mobilized in response to illness-related stress and, in turn, both stress and support are associated with recovery outcomes: stress worsening them and support improving them.

Chapter 2

Methods

This chapter includes the procedures and methods used in the study. In order the sections are focused on design, subjects, procedures for data collection, measurement of major concepts, and procedures for data analysis.

Design

A cross-sectional design was utilized to study the stress of illness, spouse and other close confidant support, and recovery outcomes in cardiac patients and their partners. Interviews were conducted between four to eight weeks from the date of hospital discharge. If subjects were reluctant to participate because of time or personal constraints, they were given an option to participate in the study through mailed questionnaires and telephone interviews. Only two respondents (2%), however, chose this method. Four to eight weeks after hospital discharge was chosen to allow some recuperative healing and yet to tap responses of family members during an active transition period.

Subjects

Sampling criteria. A homogeneous sample of male patients was obtained to avoid gender differences and increase internal validity. These male patients were hospitalized and undergoing treatment for coronary artery disease (CAD) either coronary artery bypass surgery (CABS), percutaneous transluminal coronary angioplasty (PTCA), or were recovering from a myocardial infarction (MI). If the patient was hospitalized with a heart attack, two of the following three diagnostic

criteria were met for inclusion in the study: a) history of angina pectoris, b) electrocardiographic changes indicative of an MI, and/or c) enzyme changes. Typically, patients undergoing differing treatments for coronary artery disease, CABS, PTCA, or MI, are not combined in the same sample. Yet these patients share many similarities. From a clinical perspective, all of these patients are diagnosed with CAD, experience a recent hospitalization for treatment of CAD, are expected to make the same life-style changes, and are subject to a potential recurrence of CAD. It remains to be verified, empirically, whether patients would have a different recovery trajectory as a result of the type of treatment they received.

Couples representing a broad cross-section of social class, age, and ethnic groups were sought to obtain a representative sample. If the patient was married or currently living with a significant other, his partner was approached to participate in the study. However, if the patient was not married, the person who was the patient's main source of support during the recovery was invited to participate. Additional sampling criteria for convenience purposes included: (a) patient and partner were able to speak, read, and write English, and (b) residence within a 50-km radius from the University of Washington.

Facilities. Four institutions within the Seattle, Washington, area were utilized as sites for subject enrollment: (a) a university teaching hospital; (b) a Phase II cardiac rehabilitation program; (c) a suburban medical center; and (d) a group of primary referring cardiologists.

Procedures for Data Collection

Between January and June of 1988, all patients and their partners from the four participating sites, who met the inclusion criteria, were invited to participate in the study. The method of contacting potential subjects differed depending on the requirements to protect human subjects at each site. At the university teaching hospital, the investigator visited the hospital units daily to identify potential subjects with the nursing staff. Once appropriate subjects were identified, the investigator introduced herself to the patient and partner, explained the purpose of the study and the questions that would be asked, and provided an opportunity for questions. If patients and/or partners volunteered to participate in the study, informed consent was obtained prior to the hospital discharge (see Appendix A for consent form). At the cardiac rehabilitation site, an RN intermediary described the study to appropriate subjects and gained permission for the investigator to contact them. For the other two sites, subjects were sent an introductory letter (see Appendix B) followed by a telephone call to explain the study and allow for any questions. If subjects were interested in participating, an interview was scheduled at that time. For all subjects, informed consent was obtained to participate in the study as well as to review the patient's medical record for diagnostic information. Participants were instructed that there were no physical risks involved in this study, that they could refuse to answer any question during the interviews or on the questionnaires, and that all data collected would remain confidential.

Various structured and semi-structured questionnaires were administered to both patient and partner. The ordering of the questionnaires was held constant across interviews. At the beginning of the study, the questionnaires on the amount of change and levels of stress were mailed to respondents two weeks prior to the interview. The rationale for this was because change and stress were conceptualized to temporally precede (or cause) social support and recovery outcomes in the model (see Figure 1, Chapter 1). Hence, the measurement of stress and change preceded the measurement of the remaining concepts. However, although the questionnaires were mailed out ahead of time, most subjects did not fill them out until the interview. Hence, the time frame was inadequate to justify causal modeling techniques.

Only one interviewer was present for each interview and only one respondent was interviewed while the other completed instruments in a separate area of the home. Two research assistants were utilized to assist with data collection. These research assistants were trained in the techniques of interviewing and were oriented to the nature of the study and purpose of each questionnaire. They also accompanied the investigator on at least one interview to experience, first hand, data collection techniques. Data obtained by these assistants were monitored by the investigator for potential problematic areas, missing data, and to ensure data quality control.

Measurement of Main Concepts

All questionnaires used in this study were designed in parallel forms for the married vs. nonmarried patients and partners (spouse vs.

friend or other family member). Table 1 displays the overall dimensions and the observed indicators used for each unobserved dimension.

Illness-Related Stress. The stress of illness was reflected by the bothersome or difficult changes and circumstances, individual and relational, that arise during the recovery process (Haberman et al., 1985). Illness stress was measured by a 14-item scale that asked respondents to indicate how much each experience or behavioral change had been stressful since the hospitalization (refer to Appendix C). First, seven items were conceptualized to represent individual or personal illness-related stressors: exercise, food intake, smoking, symptoms, Type A behavior, medications, and uncertainty about if and when the illness might recur. Additionally, seven items represented relational stress factors: work/retirement activities, family roles, self-image, sexual activity, income, dependence/independence, and relational expectations. The levels of these illness stressors were assessed by three different methods to ensure multiple indicators for the measurement model. Method one was a visual analogue scale in which the respondent marked an "X" on the line to indicate the degree of stress. Each subscale ranged potentially from 0 to 469. The second method was a seven-point Likert scale ranging from 0, not at all stressful, to 6, extremely stressful, with summed scores on each subscale ranging from 0 to 42. Method three was a second type of visual analogue scale in which the subject indicated the amount of stress by the length of a line drawn. For this method, total scores on each subscale could range from 0 to 420. For all three methods, higher scores indicated greater perceived stress levels.

Table 1. Hypothesized Model: Change, Stress, Social Support, and Recovery Outcomes

Unobserved Latent Variables	Observed Indicators
Level of Individual Illness Stress	Level of stress produced by changes in: 1. Amount of exercise 2. Diet 3. Smoking 4. Symptoms 5. Type A Behavior 6. Illness uncertainty 7. Medications
Level of Relational Illness Stress	Level of stress produced by changes in: 8. Self-image 9. Work/retirement activities 10. Family role activities 11. Sexual activities 12. Income 13. Dependence/independence 14. Relational demands
Amount of Change	How much change in: 1. Amount of exercise 2. Amount of fat, cholesterol, calories 3. Amount of smoking 4. Amount of symptoms 5. Amount of Type A Behavior 6. Amount of illness uncertainty 7. Number of medications 8. Level of self-image 9. Level of work/retirement activities 10. Level of family role activities 11. Level of sexual activities 12. Amount of income 13. Amount of dependence/independence 14. Amount of relational demands
Instrumental Support	1. Amount of advice and information 2. Amount of tangible assistance

Note. Table is continued on the next page.

Table 1. (continued) Hypothesized Model: Change, Stress, Social Support, and Recovery Outcomes

Unobserved Latent Variables	Observed Indicators
Expressive Support	3. Amount of emotional support
	4. % of free time spent with partner
	5. % of time spent in disagreements
	6. Degree of closeness
	7. Communication frequency with partner
	8. Level of commitment during recovery
Physical Recovery Outcomes	1. Physical goal achievement
	2. Satisfaction with activity level
	3. Level of current physical health
	4. Level of current tasks
	5. Level of perceived heart condition[a]
	6. Level of recovery[a]
	7. Weekly activity level
	8. Myocardial ejection fraction[a]
	9. Functional aerobic impairment[a]
Psychological Recovery Outcomes	10. Psychological goal achievement
	11. Level of self-esteem
	12. Level of depressed affect
	13. Level of enervation
	14. Level of positive affect
	15. Level of anxiety
	16. Level of current psychological health
Relational Recovery Outcomes	17. Relational goal achievement
	18. Satisfaction with relational cohesion
	19. Satisfaction with relational adaptability
	20. Satisfaction with relational affection
	21. Amount of relational equity
	22. Relational commitment or probability of being partners forever
	23. Level of current relational well-being

[a]Patients only.

Amount of Change. Change was reflected by the amount of behavioral readjustments made during the recovery process in response to the illness (Sarason et al., 1978). The total amount of behavioral change was measured by a 14-item scale that asked respondents to indicate how much they had changed or experienced changes in any of the following since the hospitalization: exercise, diet, smoking, self-image, symptoms, Type A behavior, work (retirement) activities, family role activities, sexual activities, illness uncertainty, medications, income, dependence (patients) or independence (partners), and relational expectations (see Appendix D).

Similar to the measurement of stress, change also was assessed by three different methods. Method one required respondents to write in a number from 0 to 9 to indicate how much they had changed and to write in a plus or minus sign to indicate whether they had increased (+) or decreased (-) the behavior. Responses on this scale ranged from -126 to 126. For the second method, subjects indicated the direction of change by drawing a line towards one of two endpoints, greatly increased or greatly decreased, and the amount of change by the length of the line. This scale, measured in millimeters, ranged potentially from 448, if all behaviors greatly increased, to -448, if all behaviors greatly decreased. Method three was similar to the first method in that participants indicated how much each behavior had increased (+) or decreased (-), from 0 to 100 % since the hospitalization. For this method, the total amount of change could range from -1400 to 1400.

Social Support. Social support was reflected by the amount of instrumental, informational, and expressive support exchanged by

confiding partners (House, 1981; Lin, 1986). Participants were instructed to list up to four persons who had influenced (helped and/or hindered) them during the recovery period including their partners and at least one health care provider as two of the four persons. Subjects then answered a set of 16 questions for each person they listed tapping the perceived amount of the three support elements (see Perceived Support Inventory, Appendix E). Advice and information support was operationalized as suggestions about what to do, how to solve problems, or where to get needed information during the time of recovery. Instrumental support was defined as tangible assistance or help with errands or tasks around the house, going for walks, preparing special foods, or providing transportation. Likewise, expressive support was defined as someone listening to private thoughts and feelings, and/or giving physical affection. These three dimensions of support were measured by two separate methods. Method one asked respondents to assess: "how much has advice and information (tangible assistance, emotional support) from your partner helped and/or hindered you during this time of recovery?" Subjects were instructed to assign a +1 to +10 to those persons who helped (+10 being the most help given), a -1 to -10 to those persons who hindered, and a "0" to those who neither helped nor hindered. Scores for each item could range from 0-10 to indicate either a "helping" and/or a "hindering" effect.

The second method of measuring all three factors was a visual analogue scale requiring the respondent to place an "X" on the line toward the response to indicate the amount of help received (from a

particular person) during the recovery. Each item could range from no help at all (0 mm) to a great deal of help (76 mm).

The seven remaining measures of expressive support were derived from studies examining relational development and social network involvement (Eggert & Parks, 1987; Parks, Stan, & Eggert, 1983). The variable, time spent with partner, was assessed by one item: "About what percentage of your free time in the last two weeks did you spend with your mate..." (see Appendix E, no.5, for the complete question). The degree of closeness was measured by asking "how close, from 0-100, do you feel to your partner?" Similarly, level of disagreements was assessed by having respondents indicate "about what percentage of their time, from 0-100, spent communicating with your mate ends up in disagreements, arguments, or unpleasant exchanges?" To indicate communication frequency, subjects were asked to estimate the number of times and the number of minutes they communicated with their partner during a typical day. Finally, level of commitment was assessed by asking the respondents to rate how much the other person was committed to helping them during this time of recovery. This last item required individuals to place an "X" on the line toward the response that best fit them ranging from not at all (0 mm) to a great deal (76 mm).

Physical Recovery Outcomes. Generally, the recovery variables required respondents to evaluate their outcomes based on the one to two weeks prior to the interview. The level of goal achievement measured the plans and goals that both the patient and spouse expected to gain as a result of the cardiac illness situation, the importance of each of these goals, and the degree to which they were achieved (see Goal

Achievement Interview, Appendix F)(Newton & Killien, 1986). Subjects are asked about goals specifically in relation to physical, psychological, and relational adjustment domains. The percent of the goal achieved, ranging from 0 to 100%, was one index of recovery outcomes within each of the three recovery dimensions--physical, psychological, and relational.

Five additional measures of physical recovery outcomes from the respondent's perspective included: (a) the level of satisfaction with activities, (b) the level of physical health, (c) the individual's level of ability for working at usual tasks, (d) the current condition the heart was in ranging from extremely poor (0 mm) to excellent (100 mm), and (e) how much the person had recovered from the illness ranging from not at all (0 mm) to fully recovered (100 mm)(see Appendix G). All of these items were measured using a 100 mm visual analogue method.

Weekly activity levels were assessed by questions derived from the Harvard Alumni Health Questionnaire (Paffenbarger, Wing, & Hyde, 1978; Paffenbarger, Hyde, Wing, & Hsieh, 1986). Respondents were asked: "On a usual weekday and a weekend day, how much time do you spend on vigorous, moderate, light, sitting, and sleeping activities? Total for each day should add up to 24 hours" (refer to Appendix G). These various activity levels were converted to kilocalories (kcal) of energy expenditure per week by using standard values compiled by Passmore and Durnin (1955). That is, vigorous activities were rated at 10 kcal/min, moderate activities at 5 kcal/min, light activities at 1.9 kcal/min, sitting activities at 1.65 kcal/min, and sleeping was rated at 1 kcal/min (Passmore & Durnin, 1955). The amount of time spent each day

in a particular level of activity was multiplied by the energy cost of that level and the results were added across all five levels. This physical activity index was devised to provide a composite estimate of weekly energy expenditure expressed in kcal/week. Levels of energy expenditure were found in previous studies to be inversely related to the risk of heart disease and, theoretically are related to physical recovery outcomes (Paffenbarger et al., 1978; Paffenbarger et al., 1986).

Assessments of the patient's functional capacity and, thus, myocardial function were twofold, myocardial ejection fraction and the patient's functional aerobic impairment (FAI). Left ventricular ejection fraction was calculated during the cardiac catheterization and was defined as that proportion of the blood volume in the left ventricle that is pumped out with each heart beat. The FAI score, based on treadmill data, is the difference between the observed duration of the exercise test and the duration expected for a healthy person of the same age, sex, and habitual activity (Bruce, Kusumi, & Hosmer, 1973). A value between +10% and -10% is normal and >20% is abnormal. The FAI was used to compare individual differences between patients because it correlates positively with myocardial function and takes into account age, sex, and activity status.

Psychological Recovery Outcomes. Psychological recovery outcomes were operationalized to reflect levels of self-esteem, or how positively the individual was able to view the "self" in this changed situation, depression, and anxiety. Self-esteem was measured by six items from Rosenberg's (1965) Self-Esteem Scale (see Appendix H). These items

assess the self-acceptance component of self-esteem. Respondents were asked to rate each item on a 7-point Likert scale ranging from strongly agree to strongly disagree. A higher total score denotes higher self-esteem. Rosenberg reported an internal consistency (alpha) coefficient of .91; additionally, Lewis (1982) reported a reliability coefficient of .87 in a sample of terminal cancer patients. Test-retest reliability was found to be .85 over a two week period (Silber & Tibbett, 1965). Crandall (1974) reported an interscale correlation of .60 with Coopersmith's Self-Esteem Inventory. Construct validity was documented by Lewis (1982) in that self-esteem was related significantly to experienced personal control and purpose in life in a sample of late stage cancer patients.

An indicator of depression is the Center for Epidemiologic Studies' Depression Scale (CES-D) (see Appendix I). Ross and Mirowsky (1984) subjected the CES-D to factor analysis and found three factors which demonstrated the same factor structure across men and women: depressed affect, enervation, and positive affect. These three subscales, therefore, were utilized in this analysis. Internal consistency reliabilities ranged from .79 to .81, .66 to .71, and .62 to .64, for the three factors in a sample of 1,360 married men and women (Ross & Mirowsky, 1984). In the present study, respondents were asked to indicate how many days during the past week they have felt this way and to count a day even if they only felt that way for a few minutes. Responses were coded in number of days (0-7). The six specific items for the depressed affect subscale were blue, bothered by things, depressed, fearful, lonely, and sad, potentially ranging from 0-42. The

six specific items for the level of enervation were no appetite, trouble concentrating, everything an effort, trouble sleeping, talk less, can't get going, which also could range from 0-42. For these two subscales, a higher score indicated higher levels of depression. The positive affect subscale contained only four items, good as others, hopeful, happy, enjoy life, and could range from 0-28. Responses were scored so that a higher score indicated a higher level of positive affect.

Additional indicators of mood disturbance were two questions about anxiety from Spielberger's State-Trait Anxiety Inventory (see Appendix I). Subjects were asked how often they felt anxious and how often they worried about possible misfortunes (Spielberger, Gorsuch, & Lushene, 1970). Similar to the CES-D, respondents were asked to indicate how many days during the past week they had felt this way, from 0-7, and to count a day even if they only felt that way for a few minutes. Higher scores denoted greater anxiety. Finally, one item, tapping the individual's current psychological health, was measured using a 100 mm visual analogue method (see Appendix G, no. 10).

Relational Recovery Outcomes. The subjective feelings of relational satisfaction and pleasure experienced with the partner relationship were measured by the Family Satisfaction scale formulated by Olson and colleagues (Olson, McCubbin, Barnes, Larsen, Muxen, & Wilson, 1983) (see Appendix J). Because not all subjects were married or were rating other family members, wording of the items was changed to measure a close relationship regardless of the exact nature of the relationship (i.e., spouse, daughter, friend). First, relational cohesion was tapped by elements of emotional bonding, boundaries, time,

space, friends, and fun. Next, relational adaptation was assessed by elements of assertiveness, decision making, criticism, negotiation, roles, and rules. All of the items measuring relational cohesion and adaptation were rated on a 7-point Likert scale from 1 (very dissatisfied) to 7 (very satisfied) with both subscales ranging potentially from 7-42. Past alpha coefficients for the cohesion and the adaptability scales were .85 and .84; and the five-week, test-retest correlational coefficients for these same subscales were .76 and .67 respectively (Olson, Sprenkle, & Russell, 1979). Two additional questions were added: "how satisfied are you with how the two of you express affection," and "how satisfied are you with how you relate sexually," to further assess important aspects of the interpersonal relationship (see Appendix J). Higher scores for all subscales denoted greater relational satisfaction.

Equity in the relationship was measured by the Perceived Equity Scale of Hatfield, Utne, and Traupmann (1978). An equitable relationship is one in which individuals perceive relatively equal gains from the relationship; the greater the equity, the greater the relational satisfaction (Hatfield et al., 1978). The total equity score, summed across four items, ranged from -12 to +12 with scores closer to zero indicating greater equity (refer to Appendix K).

One question assessed relational commitment (see Appendix G, no. 27): "What is the percent chance that you will always be together with this person" (Parks, Stan, & Eggert, 1983). The greater the probability of being partners forever, the greater the relational commitment. Finally, a visual analogue method measured the individual's perception

of current relational well-being from extremely poor (0 mm) to excellent (100 mm) (see Appendix G, no. 11).

In sum, the design of the study was correlational; the variables in the model were measured by a survey questionnaire. The purpose was to test a theoretical model of adjustment to a life-threatening illness for cardiac patients and their partners linking the variables of change, stress, social support, and recovery outcomes. The amount of illness-related change was conceptualized as the total amount of behavioral readjustments made during the recovery process in 14 areas including lifestyle, illness factors, and family activities. The perceived level of stress was conceptualized as two main dimensions namely individual illness stress and relational illness stress factors. Both dimensions were measured by seven observed indicators of the level of stress produced by changes in lifestyle, illness factors, and family activities. Social support was conceptualized as instrumental, informational, and expressive support. These three dimensions were then operationalized as eight observed indicators. Recovery outcomes were conceptualized as physical, psychological, and relational outcomes, with five to seven observed indicators for each dimension. The techniques used for data analysis and the findings are discussed in Chapter 3.

Chapter 3

Results

The present chapter contains the results of the data analysis. The findings are presented in the following order: (a) description of the sample; (b) comparisons between patients who did and did not participate on selected illness variables; (c) respondent demographic characteristics; (d) preliminary analyses of the main dimensions under investigation: change, stress, social support, and recovery outcomes; and (e) confirmatory factor analysis as a test of the measurement model of links between each latent factor and the observed manifest indicators, and the structural model of associations among the unobserved dimensions. Hence, the hypotheses became the associations between the dimensions of change, stress, support, and recovery outcomes.

Descriptive Characteristics

Sample size. The total number of patients contacted to participate from four sites was 133. Of these 133 patients, 94 volunteered to take part in the study representing 71% of the available population. Reasons for nonparticipation are cited in Table 2. Of the 94 patients, 85 partners volunteered to take part in the study. Nine patients chose to participate in the study without partners. In these situations, either the partner was not interested in participating, or the patient was reluctant to ask someone in their social network to participate as a partner.

Patients who participated in the study were compared to subjects who chose not to participate on several demographic and illness

variables. There were no differences between the two groups, utilizing the Student's t-test, in age, Hollingshead Occupational categories, marital status, ethnic background, and selected illness variables--type of illness event, left ventricular ejection fraction,

Table 2. Reasons for Nonparticipation

Reasons	n (%)
Lack of interest	12 (31%)
Time constraints	12 (31%)
Refused after receiving forms	5 (13%)
Refused because of postoperative problems	5 (13%)
Unable to contact after several attempts	3 (8%)
Unable to read English	1 (2%)
Died	1 (2%)
Total refused	39 (100%)

the number of coronary arteries bypassed, and the number of in-hospital complications. Even though the patient groups did not differ from one another, data were unavailable to compare the partners on similar variables. Thus, there may be something unique about the interpersonal relationships of the couples who did not participate that would preclude generalizing the findings about interpersonal relationships to the larger population of cardiac couples.

Respondent characteristics. All 94 patients were male as planned. The ages of the patients ranged from 30 to 80 years with a mean of 61

(s.d.=9.7). Eighty-two percent (n=77) were married and another six percent (n=6) were cohabitating. The length of time the couples had been together ranged from 3 to 54 years with a mean of 31.2 (s.d.=14.4). The remaining 12% (n=10) of the patients were either divorced, widowed, or never married. One patient was separated recently from his wife. The study partners of these latter patients were either an adult family member or a friend.

Of the 85 partners, 83 were female and 2 were male. The ages of the partners ranged from 26 to 80 years with a mean of 57 (s.d.=11.8). Although 9 partners did not participate, patients still responded to questions about social support and relational satisfaction in relation to the "study partner". Eight of these partners were female and one was male.

Additionally, the majority of both the male patients and the female partners were white and protestant, with one or more years of education after high school. Approximately half of the patients were employed currently or retired. Using Hollingshead's (1975) classification, about 60% of the patients worked in semi-professional or professional occupations and 40% worked in either semi-skilled or skilled occupations. The income of two-thirds of the couples was greater than $20,000 annually. About 50% of the partners were employed currently, 20% were homemakers, and the remaining 30% were retired. The majority of the partners, 60%, worked in semi-skilled or skilled occupations, whereas the remaining 40% were in semi-professional or professional jobs. Refer to Table 3 for these demographic data.

Table 3. Demographic Characteristics of Participants

Variable	Patients (n=94) n	(%)	Partners (n=85) n	(%)
Education				
High school or less	24	(26%)	30	(36%)
1-3 years after high school	32	(35%)	31	(38%)
College graduate or post-graduate degree	35	(39%)	24	(26%)
Ethnic Background				
White	87	(94%)	76	(91%)
Japanese	2	(2%)	3	(4%)
Black	2	(2%)	2	(2%)
Native American	1	(1%)	2	(2%)
Micronesian	1	(1%)	1	(1%)
Religious Affiliation				
Protestant	52	(57%)	50	(62%)
Catholic	19	(21%)	16	(20%)
No preference	14	(15%)	6	(7%)
Other	9	(7%)	9	(11%)
Employment Status				
Retired	42	(45%)	26	(31%)
Employed currently	46	(50%)	37	(45%)
Unemployed	5	(5%)	2	(2%)
Homemaker	--	--	18	(22%)
Occupational Code (Hollingshead)				
Semi-skilled or skilled	38	(41%)	37	(58%)
Semi-professional or professional	54	(59%)	27	(42%)
Annual Household Income				
< $20,000	23	(30%)		
$20 - 40,000	29	(35%)		
> $40,000	27	(35%)		

Subjects were interviewed between 2 to 18 weeks after the illness event with a mean of 9 weeks. Not all subjects could be interviewed at the same point in the recovery process, at 6 $\pm$ 2 weeks, because of scheduling conflicts, postoperative complications, and so forth. Hence, the number of days between the illness event and the date of the interview was entered into the confirmatory factor analysis to control for the influence of this varying time interval. It was later omitted, however, because no significant associations emerged between the differing recovery intervals and any of the other variables in the models.

Preliminary Analyses

The primary analytic tool used for data analysis was confirmatory factor analysis utilizing Joreskog and Sorbom's LISREL VI (1986). It was used not only to estimate the measurement model--the links between the unobserved latent factors and the observed manifest indicators for each dimension, but also to test the structural model of associations (hypotheses) among the unobserved factors of change, stress, partner support, and outcomes of the recovery process. Hence, the hypotheses proposed in Chapter 1 became the associations between the various dimensions of change, stress, support, and outcomes of the recovery process.

Prior to testing the hypotheses with the LISREL analysis, several preliminary analyses were done. These preliminary analyses are discussed first, and are organized as follows: (a) the reliabilities of measurement; (b) treatment of missing data; (c) the indicators of recovery outcomes; (d) the indicators of social support; and (e) the

indicators of stress and change. In relation to the indicators mentioned above, the distribution of the model variables was evaluated initially because an acceptable normal distribution is a necessary prerequisite for using confirmatory factor analysis. Preliminary analyses of the indicators of each major dimension took place with exploratory and confirmatory factor analysis and reliability estimates to identify two to three of the most salient indicators of each concept (refer to Table 4). The type of exploratory factor analysis used was principal components analysis with varimax rotation. The criterion rule, Kaiser's rule, for the number of factors to be extracted was specified at an Eigen value of 1.0. This is a conservative approach to factor analysis in that there are likely to be more factors than the number that emerge from the factor analysis. Hence, the main purpose of the exploratory factor analysis was to examine whether the hypothesized dimensions were supported empirically.

There were constraints on the type of data analyses that could be performed. First, the small sample size precluded putting all of the dimensions into one multidimensional recovery model. Hence, separate patient and partner models of physical, psychological, and relational recovery were tested with confirmatory factor analysis. One of the goals of the confirmatory factor analysis procedures was to use the same observed indicators in both the patient and partner models of recovery unless substantive differences emerged between these two groups. In each instance, findings are presented for both patients and partners to facilitate comparison among models of recovery outcomes.

Table 4. Final Indicators Used for Confirmatory Factor Analysis

Unobserved Latent Factor	Observed Indicators
Physical Recovery Outcomes	1. Level of recovery[a] 2. Level of perceived heart condition[a] 3. Level of current physical health[b] 4. Satisfaction with activity level[b]
Level of Physical Activities[a]	1. Satisfaction with activity level 2. Level of current tasks
Psychological Recovery Outcomes	1. Level of enervation[b] 2. Level of depressed affect 3. Level of positive affect 4. Level of current psychological health[a]
Relational Recovery Outcomes	1. Satisfaction with relational cohesion 2. Satisfaction with relational adaptability 3. Satisfaction with relational affection
Partner Support	1. Amount of informational support 2. Amount of tangible aid 3. Amount of emotional support
Partner Hindrance[c]	1. % of time spent in disagreements[b] 2. Expressive hindering from partner[b] 3. Informational hindering from partner[b]

Note. Table is continued on the next page.
[a]Indicator for patients only.
[b]Indicator for partners only.
[c]Dimension created from the results of the exploratory factor analysis.

Table 4. (continued) Final Indicators Used for Confirmatory Factor Analysis

Unobserved Latent Factor	Observed Indicators
Level of Illness Stress	Level of stress produced by changes in: 1. Amount of exercise 2. Diet 3. Smoking 4. Symptoms 5. Type A Behavior 6. Illness uncertainty 7. Medications 8. Self-image 9. Work/retirement activities 10. Family role activities 11. Sexual activities 12. Income 13. Dependence/independence 14. Relational demands
Amount of Change	How much change in: 1. Amount of exercise 2. Amount of fat, cholesterol, calories 3. Amount of symptoms 4. Amount of Type A Behavior 5. Amount of illness uncertainty 6. Level of self-image 7. Level of work/retirement activities 8. Level of family role activities 9. Level of sexual activities 10. Amount of income 11. Amount of dependence/independence 12. Amount of relational demands

The Reliabilities of Measurement

Several of the indicators that measured psychological and relational outcomes of the recovery process were measured by multiple item scales. Reliability estimates were calculated for multi-item scales measuring depression and included the following: depressed affect, positive affect, enervation. Reliability estimates were calculated for multi-item scales measuring relational well-being, namely, satisfaction with relational adaptation, satisfaction with relational cohesion, and equity. Table 5 displays the results of the internal consistency reliabilities for the multi-item scales used in this study. These indicators appeared to have acceptable internal consistency.

Table 5. Internal Consistency Reliability Estimates[a]

Variable	Cronbach's Alpha Patients	Partners
Positive affect (CES-D)[b]	.63	.69
Positive affect-2[c]	.83	.85
Depressed affect (CES-D)	.84	.83
Enervation (CES-D)	.76	.74
Satisfaction with relational adaptation	.90	.91
Satisfaction with relational cohesion	.88	.82
Equity	.72	.82

[a]N = 88 for patient group; N = 78 for partner group.
[b]Four item subscale from CES-D.
[c]Four similar items added to CES-D subscale to increase reliabilities--this subscale used for confirmatory factor analysis.

Treatment of Missing Data

Preliminary analyses also involved the treatment of missing values. Rather than substituting mean scores for missing values, Cohen and Cohen (1983) recommended substituting a regression value based on the set of scores of the important predictor variables of that missing value. This value was calculated from the slope of the least-square, best fitting regression line for the cases with complete data. In this manner, the missing-data pairs do not influence these calculated values. Also, the score is much closer to the person's true score than is the mean score (Cohen & Cohen, 1983).

Indicators of Recovery Outcomes

Outcomes of the recovery process were posited to be a function of three unmeasured latent factors: physical, psychological, and relational well-being. First, the results of the exploratory factor analysis supported these three factors (see Appendix L, Tables 13 & 14). Next, the recovery outcomes were subjected to confirmatory factor analysis to evaluate the measurement model of the recovery outcomes as a subset prior to dividing them up into three individual submodels for both men and women. Results from the confirmatory factor analysis that were used to make decisions about whether or not to include or omit indicators included the Lambda X loadings--to establish that the parameter estimates were at least twice their standard errors, and the coefficients of determination--to evaluate the reliability of all the observed indicators jointly.

Physical Recovery Outcomes. Physical recovery outcomes were hypothesized to be reflected by physical goal achievement, satisfaction

with activity level, level of current physical health, the individual's ability to work at usual tasks, and the weekly activity level. Additionally, for patients only, it was considered to be reflected by the level of perceived heart condition, from poor to excellent, the level of perceived recovery, from not at all to fully recovered, and, clinically, by myocardial ejection fraction and functional aerobic impairment (FAI).

Only two-thirds of the participants reported setting goals in relation to the illness situation. Because these data were not available on everyone, the physical, psychological, and relational goal achievement variables were dropped from further analysis. Other variables available on less than half of the sample were indicators from the medical record: ejection fraction and FAI. Hence, these indicators of physical recovery await evaluation in the smaller subset of subjects. Additionally, the individuals' assessments of their weekly activity level, in kcals/wk, were overestimated by twice the expected normal value. Further, the results of the LISREL analysis indicated that the parameter estimate of weekly activity levels, the Lambda X, was not twice as high as its standard error. These findings suggest that the weekly activity level, as it was measured in this study, was not a reliable and valid indicator of the level of physical activities and it was deleted from any further analysis.

The remaining indicators of physical recovery outcomes were: satisfaction with activity level, the level of physical health, the level of current tasks, and, for patients only, perceived heart condition, and the level of recovery. Based on the diagnostics of the

confirmatory factor analysis, the indicators of the patient's physical recovery dimension exhibited specification errors (Herting & Costner, 1985). That is, a more realistic conceptualization of these indicators was to treat them as two dimensions rather than a single dimension of physical recovery.

The patient's physical recovery outcomes were reflected by the patient's perception of his heart condition, current physical health, and amount of recovery. Furthermore, the patient's physical recovery submodel achieved a better fit when the patient's level of activities was entered as a factor distinct from the level of physical recovery. The indicators of this separate factor were satisfaction with activities and the level of tasks; therefore, it was labelled level of physical activities. In contrast, physical health outcomes for the partner were reflected by the woman's perception of her current physical health, her ability to work at tasks, and her satisfaction with activities.

Examining the distributions of the physical recovery outcomes, patients and partners appear quite dissimilar in their mean scores (see Table 6). Patients reported being, on the average, approximately two-thirds recovered, perceived their physical health to be at about the same level as their recovery, and viewed the condition of their heart, with endpoints ranging from poor to excellent, at the upper end of the scale. In relation to physical activities, however, the patients were, on the average, at the midpoint of the scale, both in terms of their satisfaction and their perceived ability to accomplish usual tasks. Partners, in contrast to patients, reported higher levels of physical

health, and greater satisfaction with activities and ability to work at usual tasks.

Table 6. Distributions: Physical Recovery Indicators[a]

Indicator		Total Range Possible	Range	Mean/S.D.	Skewness	Kurtosis
Level of Current Physical Health	(1)[b]	0-102	13-102	69.2 (20.8)	-0.3	-0.8
	(2)		28-102	75.7 (19.4)	-0.4	-1.1
Level of Heart Condition	(1)	0-102	5-102	73.4 (20.9)	-0.8	0.34
Amount of Recovery	(1)	0-102	18-99	68.3 (18.9)	-0.5	-0.22
Satisfaction with Activity Level	(1)	0-102	1-102	51.9 (30.7)	0.1	-1.3
	(2)		5-102	65.7 (29.2)	-0.7	-0.8
Level of Tasks	(1)	0-102	1-102	59.1 (29.2)	-0.3	-1.2
	(2)		5-102	80.3 (21.1)	-1.7	2.8

[a] N=94 for patient group; N=85 for partner group. [b] 1=Patient, 2=partner.

Psychological Recovery Outcomes. The level of psychological well-being was posited to be reflected by six manifest indicators: self-esteem, depressed affect, enervation, positive affect, anxiety, and current psychological health. Results of the exploratory factor analysis of these outcomes indicated that the factor structure for both men and women was similar (see Appendix L, Tables 13 & 14).

In contrast to the differences between men and women in physical recovery indicators, each corresponding pair of means for their psychological recovery indicators demonstrated much greater similarity. Table 7 contains a summary of the distributions of psychological

recovery indicators. The mean levels of depressed affect, enervation, and anxiety were at the low end of the scale for both the patient and the partner groups. Conversely, moderate to high levels of positive affect and psychological well-being were reported, on the average, by both patients and partners.

Table 7. Distributions: Psychological Recovery Indicators

Indicator		Total Range Possible	Range	Mean/S.D.	Skewness	Kurtosis
Level of Self-Esteem	(1)[a]	6-42	6-42	36.4 (6.7)	-2.3	7.0
	(2)		6-42	36.6 (6.2)	-2.4	7.8
Level of Depressed Affect	(1)	0-42	0-42	5.3 (8.3)	2.5	7.3
	(2)		0-34	5.9 (7.3)	1.7	2.9
Level of Enervation	(1)	0-35	0-31	8.4 (8.6)	1.1	0.44
	(2)		0-31	8.3 (8.1)	1.1	0.38
Level of Positive Affect	(1)	0-56	7-56	45.5 (11.3)	-1.3	1.3
	(2)		0-56	44.0 (12.2)	-1.3	1.6
Level of Current Psychological Health	(1)	0-102	3-102	77.1 (22.6)	-1.0	0.29
	(2)		5-102	79.9 (19.2)	-1.7	3.3
Level of Anxiety	(1)	0-14	0-14	3.2 (4.2)	1.2	0.56
	(2)		0-14	3.5 (4.3)	1.2	0.20

[a] 1 = Patient, 2 = partner.

Although self-esteem was operationalized as a reflector of psychological health, it loaded on physical health instead (see Appendix L, Tables 13 & 14). Furthermore, scores from the self-esteem measure reflected a ceiling effect distribution (see Table 7). One plausible explanation for self-esteem not reflecting psychological recovery as

theorized is that it reflects a stable psychological resource rather than a transitory mood state. As a psychological resource, a positive self-attitude might help the individual either to manage the fluctuations in mood state or to withstand the difficulties posed by the illness (Pearlin & Schooler, 1978) rather than reflect psychological well-being. For these reasons, the individual's level of self-esteem was not included in additional analyses.

Another factor that was hypothesized initially to reflect psychological recovery outcomes was the level of enervation. However, items on the enervation scale--trouble sleeping, can't get going, everything an effort, no appetite, and trouble concentrating--are similar to typical postoperative experiences that cardiac surgery patients have. These experiences, as usual sequela of the surgery rather than aspects of depression, were deleted as indicators of the patient's depression. Further, the results of the confirmatory factor analysis indicated that the level of enervation was a shared indicator of physical and psychological recovery outcomes for patients. For the partners, however, the level of enervation was a valid and reliable reflector of psychological health outcomes. Finally, the level of anxiety was not related significantly to psychological outcomes and, hence, was omitted from further analyses.

Relational Recovery Outcomes. Relational recovery outcomes were posited to be reflected by six indicators: the level of current relational well-being, the amount of equity, the amount of satisfaction with relational adaptation, cohesion, affection, and the probability of being partners forever. Patients' and partners' mean scores on

relational recovery variables were similar also (refer to Table 8). On the average, both patients and partners reported moderate to high levels of current relational well-being and satisfaction with relational adaptability, cohesion, and affection. The mean score for the probability of being partners forever, from 0-100%, was very high suggesting a ceiling distribution. Partners reported slightly less relational equity than patients but the mean score for both members of the dyad was close to zero, indicating an equitable relationship.

Table 8. Distributions: Relational Recovery Indicators

Indicator		Total Range Possible	Range	Mean/S.D.	Skewness	Kurtosis
Satisfaction with Relational Adaptation	(1)[a]	5-35	8-35	29.4 (5.8)	-1.3	1.39
	(2)		5-35	27.0 (7.6)	-1.3	0.82
Satisfaction with Relational Cohesion	(1)	6-42	13-42	35.9 (6.7)	-1.4	1.66
	(2)		17-42	35.0 (7.0)	-1.1	0.35
Satisfaction with Relational Affection	(1)	1-7	3-7	6.0 (1.2)	-1.1	0.23
	(2)		1-7	5.7 (1.7)	-1.4	1.1
Level of Relational Well-being	(1)	0-102	20-102	83.0 (19.9)	-0.2	1.6
	(2)		2-102	82.7 (19.8)	-2.3	5.5
Level of Equity	(1)	-12-+12	-2-+12	2.6 (3.3)	1.4	1.94
	(2)		-10-+12	-0.6 (3.1)	1.1	6.22
Probability of Being Partners Forever	(1)	0-100	10-100	94.9 (15.0)	-3.6	14.1
	(2)		0-100	93.8 (20.6)	-3.7	13.5

[a] 1=Patient, 2=partner.

The parameter estimate of the relational commitment variable was not related significantly to its dimension of relational well-being in this sample indicating that "the probability of being partners forever" was not linked with the relational well-being factor. Therefore, it was not included in further analyses. Relational equity was a significant factor only in the partners' relational well-being and, hence, was not utilized in either model in an attempt to keep indicators the same across models and enable comparisons. Reliable and valid indicators of relational outcomes were satisfaction with relational adaptation, cohesion, and affection.

Indicators of Social Support

Social support was hypothesized to be a function of three latent factors and eight observed indicators. Instrumental support was operationalized to be reflected by the helping and hindering aspects of tangible assistance. Informational support was operationalized to be reflected by the helping and hindering aspects of advice and information. Further, expressive support was posited to be reflected by the helping and hindering aspects of emotional support, time spent with partner, degree of closeness, level of disagreements, communication frequency, and level of commitment to helping during recovery.

Respondents were asked to list up to four people, including their spouse or partner and a health care provider, who had influenced them throughout the recovery period. Seven patients and two partners did not feel that anyone other than their mates had influenced them or helped them during this time. Eighty two percent (n=77) of the patients but only 68% (n=58) of the partners were able to rate a health care

provider. In contrast, 91% (n=77) of the partners but only 74% (n=70) of the patients rated a third person who had influenced them during this time of recovery. This was typically another family member. Because the numbers of supporters outside the dyad declined dramatically, spousal support only was examined in this set of analyses to ensure the largest possible sample size for confirmatory factor analysis.

For the indicators of social support, separate exploratory factor analysis were done for both patients and partners (refer to Tables 15 & 16, Appendix L). An unanticipated result of these factor analyses indicated that although informational, expressive, and tangible support were operationalized as three separate factors of support, all three types of support loaded very highly (.46 to .83) on the same dimension. Also, several variables were not included in the confirmatory factor analysis for a variety of reasons. One of these variables was communication frequency. Approximately 15 percent of the respondents had a very difficult time with and chose not to respond to how much time they spent communicating with their partner during the day. This was the case in situations where couples spent the entire day together and talked off and on throughout the day. Another variable not included was degree of closeness; it demonstrated a different pattern of results across patients and partners. That is, for the partners, relational closeness loaded about the same on all of the factors generated by the exploratory factor analysis (refer to Table 16). For the patients, degree of closeness loaded on the "positive aspects of support" factor. Factor analysis of the partner's data also revealed method variance between the first and second pages of the set of questions on partner

support. That is, the first factor was determined by items from the second page of the questionnaire (see Appendix E, nos. 9-14) whereas factor 3 was determined by the first three items on the front page of the questionnaire (see Table 16, Appendix L, for results of factor analysis). Yet, it was hypothesized that the amount of information, measured by method one, would load with amount of information, measured by method two, and so forth.

Because the amounts of informational, emotional, and tangible support were the theoretical elements of interest and because they loaded on the same factor, it was decided to combine these three variables into one global dimension of support. The positive aspects of support were reflected by the total amount of aid, expressive, and informational support, three indicators, averaged across methods one and two. The second factor, the conflictual or negative aspects of support, was reflected by the percentage of communication time that ends up in arguments or unpleasant exchanges and the amount of expressive and informational hindrance during this time of recovery. Hence, the two dimensions of support that were utilized for the confirmatory factor analysis were the supportive (partner support) and nonsupportive (partner hindrance) aspects of partner support.

A summary of the descriptive statistics for the partner support indicators for both groups is presented in Table 9. Patients reported receiving much greater levels of all three types of support from their partners than these women reported receiving from the patients. Partners, in contrast, perceived themselves as receiving only moderate levels of support from the patient. Patients reported that about 10% of

their time spent communicating with their mate ends up disagreements, arguments, or unpleasant exchanges whereas partners reported it to be about 15%. On the average, partners reported receiving low levels of emotional and informational hindrance from their mates; patients perceived even less hindrance from the partners.

Table 9. Distributions: Social Support Indicators

Variable		Total Range Possible	Range	Mean/S.D.	Skewness	Kurtosis
Information Support	(1)[a]	0-112	1-111	83.3 (28.2)	-1.2	0.87
	(2)[a]		0-111	67.4 (31.0)	-0.56	-0.65
Tangible Assistance	(1)	0-112	2-112	94.9 (21.4)	-2.1	4.6
	(2)		0-111	57.1 (31.0)	-0.13	-0.82
Expressive Support	(1)	0-112	16-111	92.3 (23.6)	-1.8	2.8
	(2)		0-111	71.9 (32.2)	-0.68	-0.60
Amount of Arguing	(1)	0-100	0-90	10.7 (18.3)	2.7	7.7
	(2)		0-100	14.6 (22.0)	2.3	5.1
Emotional Hindrance	(2)[b]	0-10	0-10	0.44 (1.7)	4.3	18.6
Informational Hindrance	(2)[b]	0-10	0-10	0.48 (1.6)	4.1	18.6

[a]1=Patient, 2=Partner. [b]Data not available from patients because of zero variance in item.

Indicators of Stress and Change

Perceived Stress. The level of stress was posited to be a function of two unobserved latent factors: illness-related individual stress and relational stress. Items that were considered to reflect individual illness stress were the amount of difficulty or bothersomeness produced by changes in the amount of exercise, diet,

smoking, self-image, symptoms, Type A behavior, illness uncertainty, and medications. Items that were considered to reflect relational illness stress were the amount of difficulty or bothersomeness produced by changes in usual work activities, family roles, sexual activities, income, independence, self-image, and family expectations. These two stress subscales were constructed and were entered into the confirmatory factor analysis as two separate dimensions of stress. However, numerous shared paths and correlated error terms between the various indicators and a phi correlation of .80 between the two dimensions suggested that individual and relational stress were one dimension. Further, a better fit was obtained when they were collapsed into one dimension. Hence, the meaning of stress was reflected in the individual's perceived difficulty or bothersomeness produced by changes in the amount of exercise, diet, smoking, self-image, symptoms, Type A behavior, illness uncertainty, and medications. Further, it was reflected by perceived difficulty produced by changes in usual work activities, family roles, sexual activities, income, independence, and relational expectations. Thus, stress is the difficulty or bothersomeness of all of the illness-related individual and relational changes and experiences.

Stress was measured using three different methods and the internal consistency reliabilities for the three stress scales ranged from .83 to .91 for the patients' scores and .83 to .87 for the partners' scores. A summary of the descriptive statistics for patients' and partners' levels of stress is presented in Table 10. The mean stress levels for both the male patients and the female partners were at the lower end of the scale

suggesting relatively low levels of stress for these groups. Partners reported experiencing somewhat greater stress levels than did patients.

Table 10. Distributions: Indicators of Stress and Change[a]

Variable		Total Range Possible	Range	Mean/S.D.	Skewness	Kurtosis
Stress Method 1	(1)[b]	0-938	11-749	191.0 (155.7)	1.3	1.6
	(2)[b]		0-640	212.2 (152.3)	0.96	0.20
Stress Method 2	(1)	0-84	0-64	18.0 (13.1)	0.95	0.80
	(2)		0-64	18.1 (14.0)	0.91	0.50
Stress Method 3	(1)	0-854	0-606	128.2 (123.2)	1.6	2.6
	(2)		0-567	139.5 (140.3)	1.2	0.70
Change Method 1	(1)	0-108	4-88	34.7 (17.2)	0.66	0.38
	(2)		0-73	26.5 (18.2)	0.75	-0.24
Change Method 2	(1)	0-384	4-303	106.5 (64.6)	0.89	0.50
	(2)		0-258	86.5 (57.0)	0.89	0.49
Change Method 3[c]	(1)	0-120	5-90	41.7 (20.5)	0.38	-0.48
	(2)		0-96	33.5 (22.3)	0.65	-0.07

[a] n = 94 in patient group; n = 85 in partner group.
[b] 1=Patient, 2=Partner.
[c] Square root of raw score was obtained before summing across items because data values were too large for SPSS-X.

Perceived Change. The amount of change was hypothesized to be the amount of behavioral readjustments made in the following areas since the hospitalization: exercise, diet, smoking, self-image, symptoms, Type A behavior, work (retirement) activities, family role activities, sexual activities, illness uncertainty, medications, dependence/independence, income, and relational expectations. Initially, the internal consistency reliabilities of the three change scales ranged from .21 to .38. All three methods measuring change levels required subjects to

indicate how much the behavior had increased or decreased. Based on the investigator's field notes, it did not appear difficult for participants to evaluate how much change had occurred but it was confusing for them to assign the direction of change. For example, symptoms of angina for some individuals may have decreased compared to before the heart surgery but their incisional pain was greater so they were not sure if they should mark increase or decrease. Other researchers have suggested that it is not the direction of change but rather the absolute amount that is likely to have the greatest impact on levels of stress and health outcomes (Ruch, 1977). For this reason, the direction of change was omitted from the calculation of change scores and the absolute amount of change was included as the manifest indicator of change. Twelve items were summed to indicate the total level of change for both patients and partners. Two items, the amount of change in smoking behavior and in the number of medications, were dropped because of low variability in the items. When the absolute amount of change was computed, internal consistency reliabilities for the three scales ranged from .69 to .78 for patients' scores and .74 to .80 for the partners' scores.

The results of the confirmatory factor analysis suggested that the amount of change was measured, accurately and reliably, by the individual's perception of the absolute amount of change in the following behaviors: exercise, diet, self-image, symptoms, Type A behavior, illness uncertainty, usual work or retirement activities, family roles, sexual activities, income, independence, and expectations. A summary of the descriptive statistics for the amount of change for patients and partners is presented in Table 10. Overall, patients

reported experiencing more illness-related changes than did their partners. However, both individuals' average change scores were at the lower end of the scale.

Confirmatory Factor Analysis

The hypotheses in this study were expressed as associations among the dimensions of recovery from a life-threatening illness. A separate model was fit for each of the three dimensions of recovery for both patients' and partners' responses (refer to Figures 2-7). In the following structural models, all the latent variables were considered exogenous and allowed freely to intercorrelate; the causal direction was not analyzed. The double-headed, curved arrows between the variables in each model represent relationships that were significant, tested with the t statistic. Parameters with t values larger than 2.0 were considered to be significantly different from zero and, thus, statistically significant (Boyd, Frey, & Aaronson, 1988). The links between the latent and manifest variables, the Lambda X estimates, are designated within Figures 2-7, between the concept and the indicator. For each figure, the large circles represent the unobserved factors, squares represent their measured indicators, and small circles represent the correlated error terms of each indicator. In all of the models, each indicator was related significantly to its dimension; that is, the Lambda X parameter estimates were at least twice their standard errors. Further, the total coefficient of determination for each model was at or close to 1.0, which is the highest possible value.

Assessment of Fit. For all six models tested, there were several ways of determining whether the interrelationships designated by the

hypotheses fit the data. First, the maximum likelihood chi-square statistic for all the models was a relatively small, nonsignificant chi-square. The objective was to obtain a small chi-square value with p close to or > .10. This is evidence that the specified model and the data are congruent rather than different (Boyd et al., 1988). Second, all of the models achieved a Goodness-of-Fit Index (GFI) of close to .90 or above, indicative of a good fit (Boyd et al., 1988). Other methods of assessing the goodness-of-fit include evaluating: (a) the adjusted goodness of fit (AGFI), which is a more accurate index of fit and should be fairly close to the GFI optimally; (b) the root mean square residual (RMR), the smaller the value of the RMR, the better the fit of the model; and (c) no normalized residuals greater than 2.0 (Herting & Costner, 1985). Because causal modeling was not done, however, it was not determined how much variance was explained in the recovery outcomes by the remaining variables in the models. Thus, the hypothesized models account adequately for the variances among the research variables (e.g., have a high GFI) but may explain little of the variance in the endogenous variables.

Associations Among Measurement Errors

The fit of the models of physical, psychological, and recovery outcomes was improved considerably by dealing with spurious association specificiation errors (Herting & Costner, 1985). This involved correcting for omitted associations between error terms of measured variables initially assumed uncorrelated. If modification indices were >5.0, correlated measurement error between these two indicators was specified. Each correlated error path allowed in the models led to a

significant reduction in the chi-square; that is the change in chi-square, 1 d.f., was > 3.84, $p < .05$. The patterns of correlated errors were examined for their conceptual meaning. For the patients, two sets of correlated error terms occurred between the stress and change measures and between the various methods of measuring stress. These sets of correlated errors can be explained by a response bias as these measures were close both conceptually in the content of the questions and physically on the questionnaire. For the partners, emotional support from their mates correlated with time spent in disagreements. Similar to the patients, this appears to be a reponse bias because these two items were close on the questionnaire. Another set of correlated error terms for the women was between their perception of support and hindrance from their mates. The women's perception of support from their mates might have been colored by how much hindrance they perceived or vice versa.

The Patients' Submodels of Recovery Outcomes

Across all of the patients' submodels of recovery, there was a consistent pattern of relationships common to all models. The amount of change was hypothesized to associate positively with the level of stress (refer to Table 11). This relationship was supported across all of the patients' models suggesting that greater amounts of change were associated with greater levels of stress. Likewise, the level of illness stress was predicted to associate positively with the level of partner support. However, the direction of the association, although significant, was negative rather than positive indicating that greater levels of partner support were associated with lower levels of stress.

Finally, advancing age was associated consistently with less illness-related change and stress.

Patients' Physical Recovery Outcomes. Physical recovery outcomes were hypothesized to associate negatively with illness-related change and stress and positively with partner support (refer to Table 11). Because of the broad age span of these participants, age was entered as a covariate for all individuals' models of recovery. It was treated as an exogenous variable with perfect measurement. In relation to the patients' physical recovery outcomes, the only hypothesis that was supported by the results of this study was that greater stress levels were associated with lower levels of physical recovery outcomes. Figure 2 displays a graphic representation of the dimensions of the patient's physical recovery. Two dimensions emerged from the confirmatory factor analysis that were related significantly to greater physical recovery outcomes, namely higher levels of physical activities and older age. In turn, higher levels of physical activity were associated with lower levels of stress and change. Contrary to expectations, social support from the partner was not related to either the patient's activity level or the level of physical recovery. However, greater partner support was associated with lower perceived stress levels for the patients although it was in the opposite direction than hypothesized. Hence, the patient's level of physical recovery was greater with lower levels of stress, older age, and higher levels of physical activity.

Patients' Psychological Recovery Outcomes. The majority of the hypotheses connecting change, stress, support, and psychological recovery outcomes were supported (refer to Table 11). The patient's

submodel of psychological recovery is depicted in Figure 3. As hypothesized, better psychological recovery outcomes were associated with increased social support from the partner, less perceived stress, and less change. Unexpected findings suggested that greater psychological outcomes were associated also with older age and less partner hindrance. Higher levels of perceived stress were associated with less partner support, a greater amount of illness-related change, and more partner hindrance. Finally, greater levels of change were associated also with greater partner hindrance.

Patients' Relational Outcomes. Relational satisfaction for the patients was hypothesized to associate negatively with less change and less stress and positively with greater partner support (see Table 11). Yet, only the latter hypothesis was supported by the results of this study. The correlations among dimensions of the patients' relational outcomes are represented in Figure 4. Greater levels of relational satisfaction were associated with two variables in the model--partner support and partner hindrance. This suggests that higher levels of patients' relational outcomes were associated with more supportive exchanges between the couple and fewer nonsupportive exchanges. Similar to the first two models of patient outcomes, perceived stress correlated inversely with social support from the partner and positively with the amount of arguing. In contrast to earlier models, increasing age was associated with an increase in perceived social support.

The Partners' Submodels of Recovery Outcomes

Across the partners' submodels of recovery there was a consistent pattern of relationships common to all models. The amount of change was

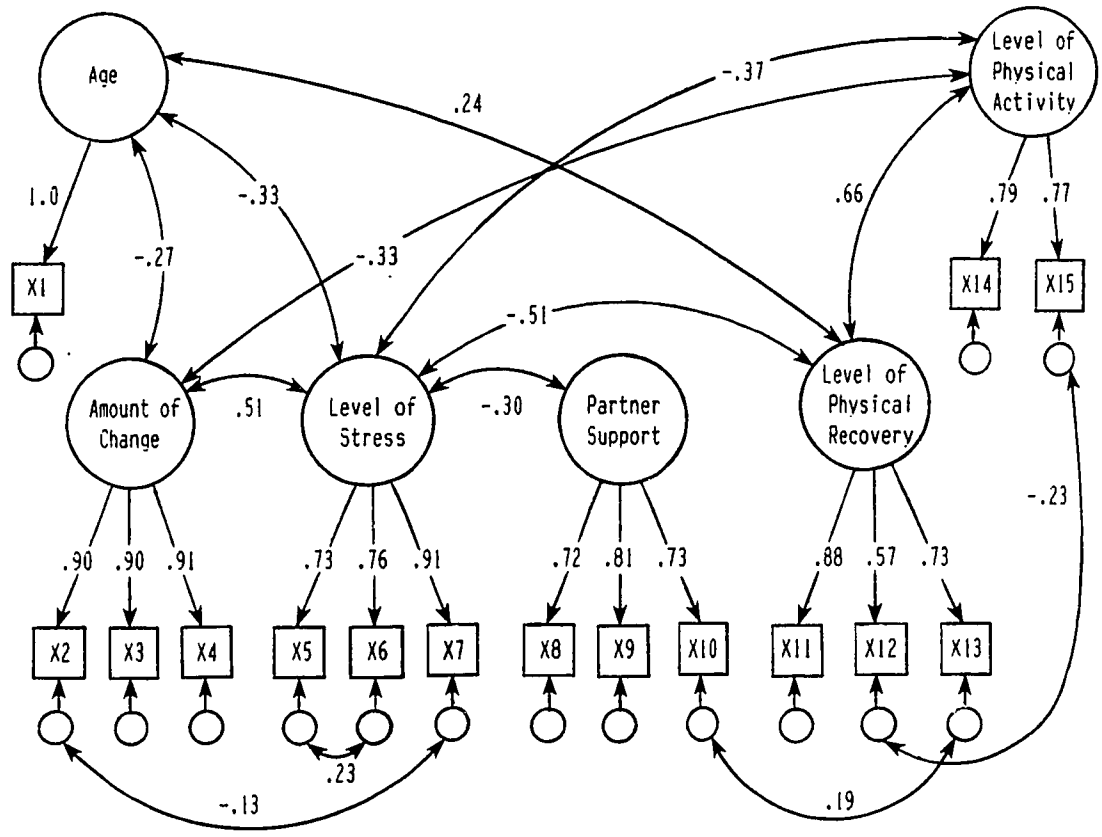
Table 11. Summary of Results for Hypothesized Associations Between Dimensions

Hypothesis	Patients	Partners
H1: The amount of change for both the patient and the partner associates positively with both the individual and relational levels of stress.	Not applicable in respecified model	
H1 respecified: The amount of change for both the patient and the partner associates positively with stress levels.	Accepted	Accepted
H2: The level of illness stress associates positively with the level of partner instrumental and expressive support (for both the patient and partner).	Not applicable in respecified model	
H2 respecified: The level of illness stress associates positively with the level of partner support.	Rejected[a]	Rejected
H3: The level of individual illness stress associates positively with the level of partner instrumental support moreso than with partner expressive support.	Not applicable in respecified model	
H4: The level of relational illness stress associates positively with the level of partner expressive support moreso than with partner instrumental support.	Not applicable in respecified model	
H5: The amount of illness-related change associates inversely with physical recovery outcomes.	Rejected	Rejected
H6: The amount of illness-related change associates inversely with psychological recovery outcomes.	Accepted	Accepted
H7: The amount of illness-related change associates inversely with relational recovery outcomes.	Rejected	Rejected
H8: The level of individual and relational stress levels associates inversely with physical recovery outcomes.	Not applicable in respecified model	
H8 respecified: The level of stress associates inversely with physical recovery outcomes.	Accepted	Accepted
H9: The level of individual and relational illness stress associates inversely with psychological recovery outcomes.	Not applicable in respecified model	
H9 respecified: The level of stress associates inversely with psychological recovery outcomes.	Accepted	Accepted

Note. Table is continued on next page. [a]Direction of association although significant was negative rather than positive.

Table 11 (continued). Summary of Results for Hypothesized Associations Between Dimensions

Hypothesis	Patients	Partners
H10: The level of individual and relational illness stress associates inversely with relational recovery outcomes.	Not applicable to respecified model	
H10 respecified: The level of stress associates inversely with relational recovery outcomes.	Rejected	Accepted
H11: The amount of expressive support from the partner associates positively with psychological recovery outcomes.	Not applicable to respecified model	
H11 respecified: The amount of partner support associates positively with psychological recovery outcomes.	Accepted	Rejected
H12: The amount of expressive support from the partner associates positively with physical recovery outcomes.	Not applicable to respecified model	
H12 respecified: The amount of partner support associates positively with physical recovery outcomes.	Rejected	Rejected
H13: The amount of expressive social support from the partner associates positively with relational recovery outcomes.	Not applicable in respecified model	
H13 respecified: The amount of partner support associates positively with relational recovery outcomes.	Accepted	Accepted
H14-16: The level of instrumental and informational partner support demonstrates a positive relationship with physical, psychological, and relational recovery outcomes for both members of the dyad.	Not applicable in respecified model	
H17: The patient's perception of expressive and instrumental partner support demonstrates a stronger positive association with recovery outcomes than the level of support from other sources.	Not applicable in respecified model	
H18: The partner's perception of expressive and instrumental support from other sources demonstrates a stronger positive association with recovery outcomes than the level of support from the patient.	Not applicable in respecified model	
H19: The partner's perceived level of expressive support from the patient, moreso than instrumental support, associates positively with recovery outcomes.	Not applicable in respecified model	

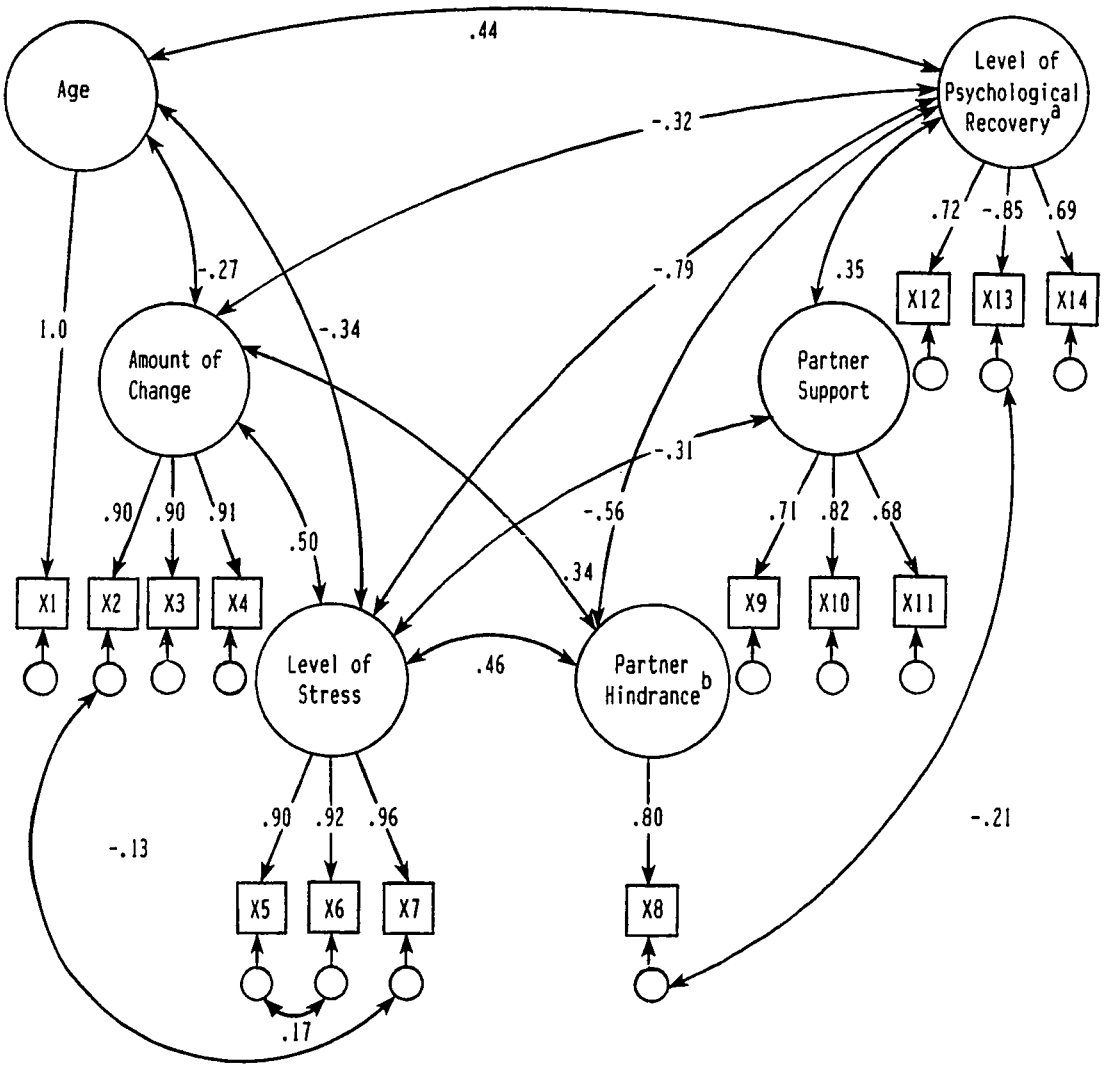


X1 = Age
X2 = Amount of Perceived Change (Method 1)
X3 = Amount of Perceived Change (Method 2)
X4 = Amount of Perceived Change (Method 3)
X5 = Level of Perceived Stress (Method 1)
X6 = Level of Perceived Stress (Method 2)
X7 = Level of Perceived Stress (Method 3)
X8 = Tangible Assistance from Partner
X9 = Informational Support from Partner
X10 = Emotional Support from Partner
X11 = Level of Current Physical Health
X12 = Level of Heart Condition
X13 = Amount of Recovery
X14 = Satisfaction with Activity Level
X15 = Current Level of Tasks

Overall Goodness-of-Fit of the Model

Chi-square	df	p	GFI	AGFI	RMR
60.90	72	$p = .821$	.916	.790	.051

Figure 2. Final Submodel of Correlations Among Patients' Physical Recovery Outcomes



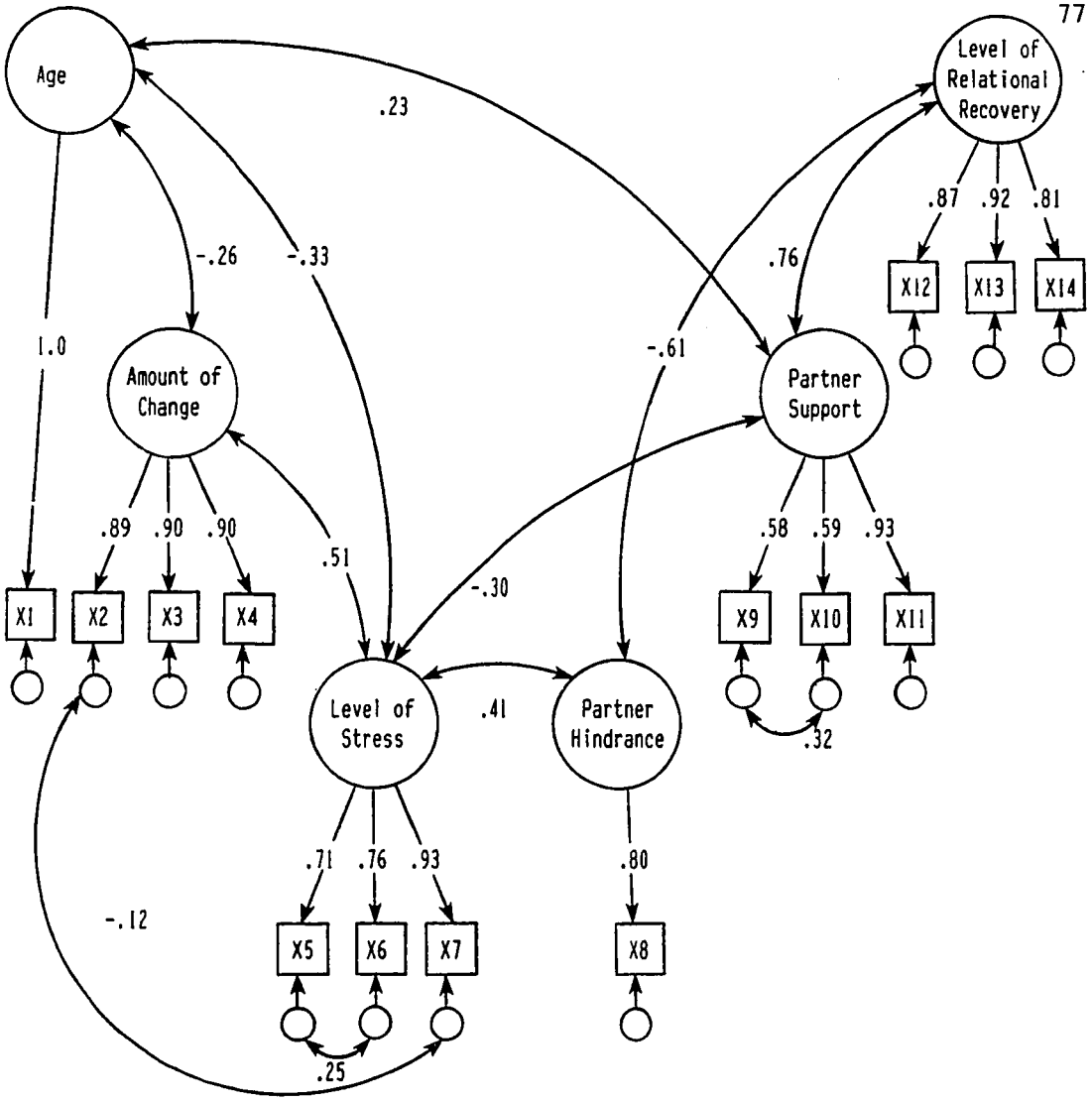
X1 = Age
X2 = Amount of Perceived Change (Method 1)
X3 = Amount of Perceived Change (Method 2)
X4 = Amount of Perceived Change (Method 3)
X5 = Level of Perceived Stress (Method 1)
X6 = Level of Perceived Stress (Method 2)
X7 = Level of Perceived Stress (Method 3)
X8 = % of Time Arguing with Partner
X9 = Tangible Assistance from Partner
X10 = Informational Support from Partner
X11 = Emotional Support from Partner
X12 = Level of Current Psychological Health
X13 = Level of Depressed Affect
X14 = Level of Positive Affect

[a]Psychological recovery assumed a positive valence in this model and hence reflected positive affect
[b]The loading for this single indicator was fixed at .80 which assumes some measurement error and approximates its epistemic correlation.

Overall Goodness-of-Fit of the Model

Chi-square	df	p	GFI	AGFI	RMR
65.26	61	p = .331	.903	.768	.062

Figure 3. Final Submodel of Correlations Among Patients' Psychological Recovery Outcomes



X1 = Age
X2 = Amount of Perceived Change (Method 1)
X3 = Amount of Perceived Change (Method 2)
X4 = Amount of Perceived Change (Method 3)
X5 = Level of Perceived Stress (Method 1)
X6 = Level of Perceived Stress (Method 2)
X7 = Level of Perceived Stress (Method 3)
X8 = % of Time Arguing with Partner
X9 = Informational Support from Partner
X10 = Tangible Assistance from Partner
X11 = Emotional Support from Partner
X12 = Satisfaction with Relational Adaptation
X13 = Satisfaction with Relational Cohesion
X14 = Satisfaction with Relational Affection

Overall Goodness-of-Fit of the Model

Chi-square	df	p	GFI	AGFI	RMR
60.16	61	$p = .506$	.915	.797	.047

Figure 4. Final Submodel of Correlations Among Patients' Relational Recovery Outcomes

hypothesized to associate positively with the level of stress (refer to Table 11). This relationship was supported across all of the partners' models (r = .74) suggesting that greater amounts of change were associated with greater levels of stress. Likewise, the level of illness stress was predicted to associate positively with the level of partner support. This relationship, however, was not supported in any of the partners' models of recovery indicating that support from the patient was not linked to these women's experience of illness stress. Similar to the patients, advancing age was associated consistently with less illness-related change and stress. In contrast to the patients, advancing age for the women was associated with less hindrance and higher levels of support from the mate.

Partners' Physical Health Outcomes. For the women, physical health outcomes were hypothesized to associate negatively with illness-related change and stress and positively with support from the mate (refer to Table 11). Only one dimension, however, the level of stress, correlated significantly with the partner's level of physical recovery (refer to Figure 5). The greater the partners' perceived stress levels, the lower their level of physical health outcomes. Further, it was hypothesized that social support, particularly expressive support from the patient, also would influence the partners' physical health outcomes and stress levels but neither relationship was supported by the data. Social support from the mate was related significantly to age and to the amount of hindrance from their mate. These data suggest that partners perceived greater amounts of social support from their mate with greater age and less conflict exchanged within the relationship. Partners

reporting greater relational conflict also perceived greater change and stress levels. Hence, although support from the patient was not related to these women's stress and physical health levels as hypothesized, greater levels of nonsupportive exchanges with the mate was associated with greater amounts of stress and change.

Partners' Psychological Health Outcomes. Higher levels of psychological health outcomes for the women were hypothesized to associate negatively with greater levels of change and stress and positively with support from the mate. These hypotheses were supported except for the latter one (refer to Figure 6). That is, less depression was associated with less illness-related change and stress but, contrary to expectations, less depression was not related to partner support. In addition, greater psychological health outcomes for the partners were associated with older age and less hindrance from their mates. In turn, a greater perception of hindrance from the mate was related to greater levels of stress, change, increased age, and less partner support.

Who supports the partners? Thus far, in both partner models, the partners' perceptions of support from their mates did not correlate significantly with the partners' levels of change, stress, and physical and psychological health outcomes. For this reason, the partners' perceptions of support from one other person in their network was examined. Most of the partners (n=77, 91%) were able to rate one additional source of support besides their mates. This relationship was either an adult family member (67%), a friend or neighbor (29%), or a religious leader (4%). The gender of this significant other was a woman for 35% of the partners and a man for the remaining 65%. Table 12

contains zero-order correlation coefficients between the amount of "partner support," "other support," and selected variables in the model. The results from the first method of measuring partner support--to assign a +1 to +10 to those persons who provided helped, +10 being the most help given--indicated that there were few significant associations between the women's perceptions of support from either the mate or the significant other and their levels of stress, change, positive affect, and negative affect. In contrast, the results from Method 2--a visual analogue scale requiring the respondent to place an "X" on the line to indicate the amount of help received from no help at all to a great deal of help--were quite different. Almost all the zero-order correlations between the partners' perceptions of mate support and their levels of stress, change, positive affect, and negative affect were significant; whereas these same relationships were not significant for "other support" (refer to Table 12). Hence, it seems that partners were getting more support from their mates than they were from at least one significant other. Yet, support from the mate, when combined into a global dimension of support, was not linked significantly with the partners' stress or change levels or their physical or psychological recovery outcomes.

Partners' Relational Well-Being. The majority of the hypotheses linking change, stress, support from the mate, and relational well-being for the women were supported. Greater relational well-being was associated with less stress, greater support from the mate, and less hindrance from the mate (see Figure 7). Hence, as the partner's relational satisfaction increased, perceived stress and conflict within

the relationship decreased. The hypothesis that social support from the mate would associate inversely with the women's stress levels was not supported; this link was nonsignificant.

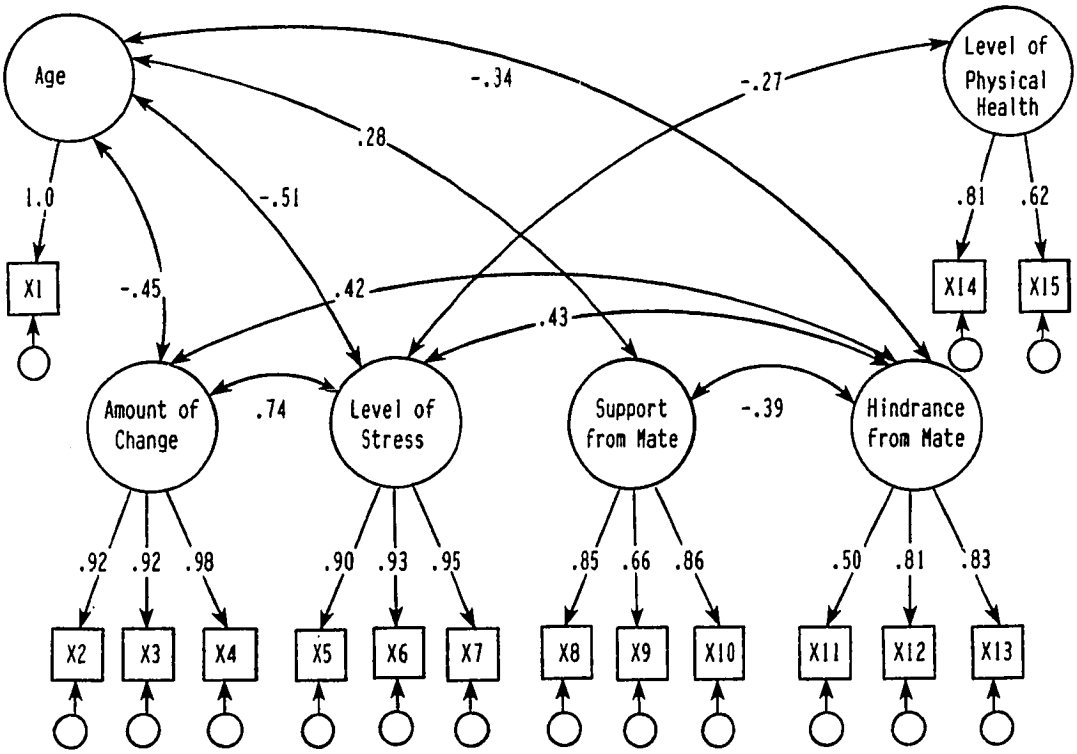
In sum, similar elements of adjustment to a life-threatening illness were linked for cardiac patients and partners. For both patients and partners, of all the factors considered, stress was the strongest correlate of psychological health outcomes but partner support was the strongest correlate of relational well-being. Greater levels of physical health were associated with lower levels of stress for both patients and partners, and with greater levels of physical activity and older age for the patients. Similarly, with increasing age, patients and partners alike perceived significantly less stress and change and better psychological health outcomes. One additional similarity between patients and partners is that all individuals perceived higher stress levels with more illness-related changes and with greater conflict exchanged within the relationship. Differences between patients and partners were manifested primarily in the "support gap" for the women and the meaning assigned to physical health. That is, increased support from one's partner was associated with decreased stress levels and psychological recovery outcomes for the patient but not for the partner. The meaning assigned to physical health for patients was the level of current physical health, condition of the heart, and extent of recovery whereas for partners the meaning assigned was reflected by current physical health and satisfaction with activities. Hence, even though levels of stress and social support from the partner were not always associated directly with outcomes of the recovery process, these

dimensions often had indirect links suggesting the centrality of these concepts to the understanding of human responses to a life-threatening illness. These results are discussed in greater detail in Chapter 4.

Table 12. Correlations Between the Women's Perceptions of Partner Support, Other Support, and Selected Illness Variables

Type of Support	Stress Method 1	Change Method 1	Positive Affect	Depressed Affect
Method 1[a]				
Tangible Assistance from:				
Partner	NS[+]	NS	NS	NS
Other	NS	.24*	NS	NS
Emotional Support from:				
Partner	NS	NS	.24*	NS
Other	NS	.22*	NS	NS
Informational Support from:				
Partner	-.21*	NS	NS	NS
Other	NS	NS	NS	NS
Method 2[b]				
Tangible Assistance from:				
Partner	NS	-.25*	.21*	NS
Other	NS	NS	NS	NS
Emotional Support from:				
Partner	-.22*	-.18*	.29*	-.23*
Other	NS	NS	NS	NS
Informational Support from:				
Partner	NS	NS	.32*	-.20*
Other	NS	NS	NS	NS

[+]NS = non-significant
*$p < .05$
[a]Assigned a +1 to +10 to those persons who provided help.
[b]A visual analogue scale ranging from no help at all to a great deal of help.

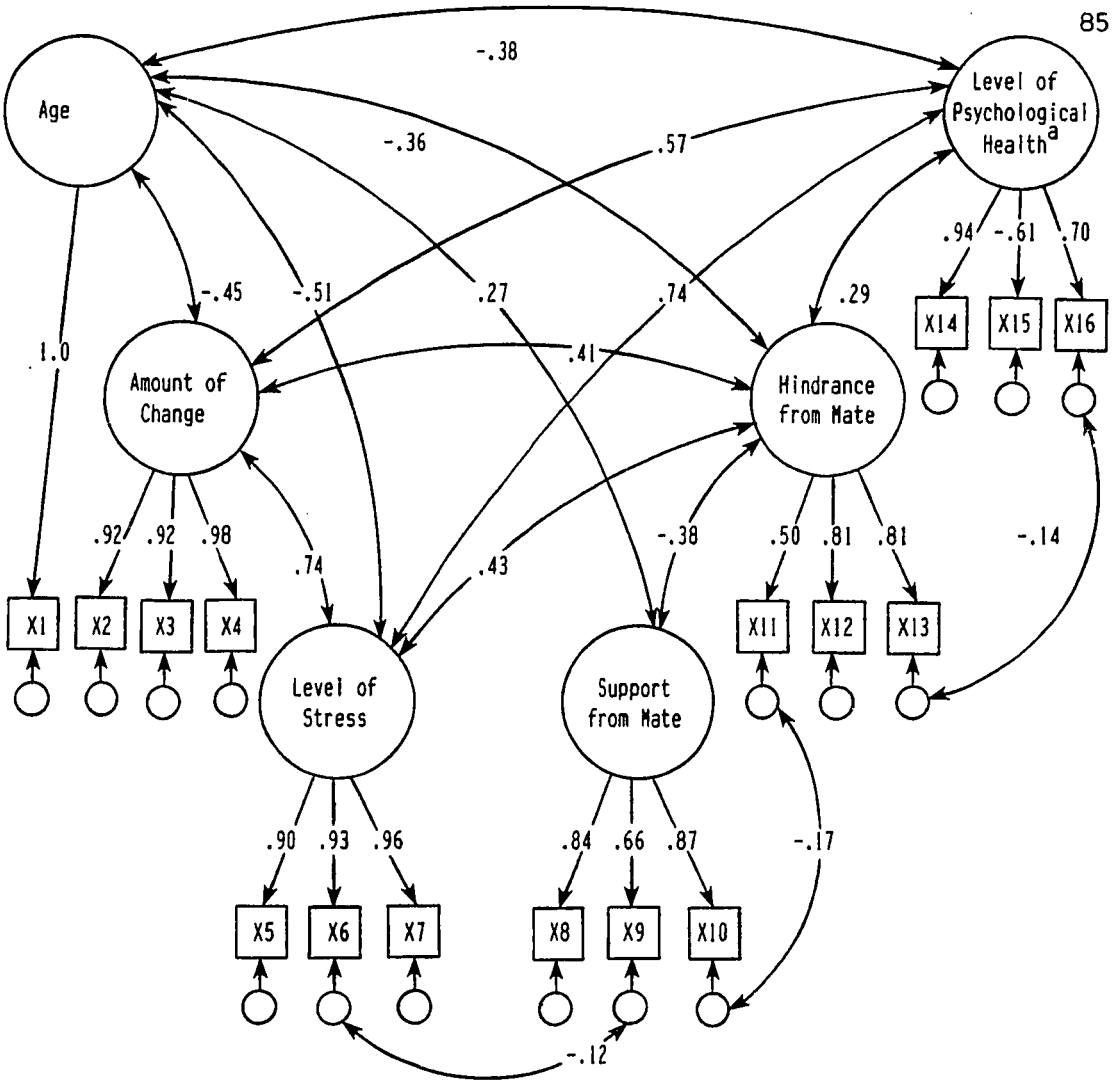


X1 = Age
X2 = Amount of Perceived Change (Method 1)
X3 = Amount of Perceived Change (Method 2)
X4 = Amount of Perceived Change (Method 3)
X5 = Level of Perceived Stress (Method 1)
X6 = Level of Perceived Stress (Method 2)
X7 = Level of Perceived Stress (Method 3)
X8 = Informational Support from Partner
X9 = Tangible Assistance from Partner
X10 = Emotional Support from Partner
X11 = % of Time Arguing with Partner
X12 = Emotional Hindering from Partner
X13 = Informational Hindering from Partner
X14 = Level of Current Physical Health
X15 = Satisfaction with Activities

Overall Goodness-of-Fit of the Model

Chi-square	df	p	GFI	AGFI	RMR
75.53	74	$p = .429$	.896	.730	.046

Figure 5. Final Submodel of Correlations Among Partners' Physical Health Outcomes



X1 = Age
X2 = Amount of Perceived Change (Method 1)
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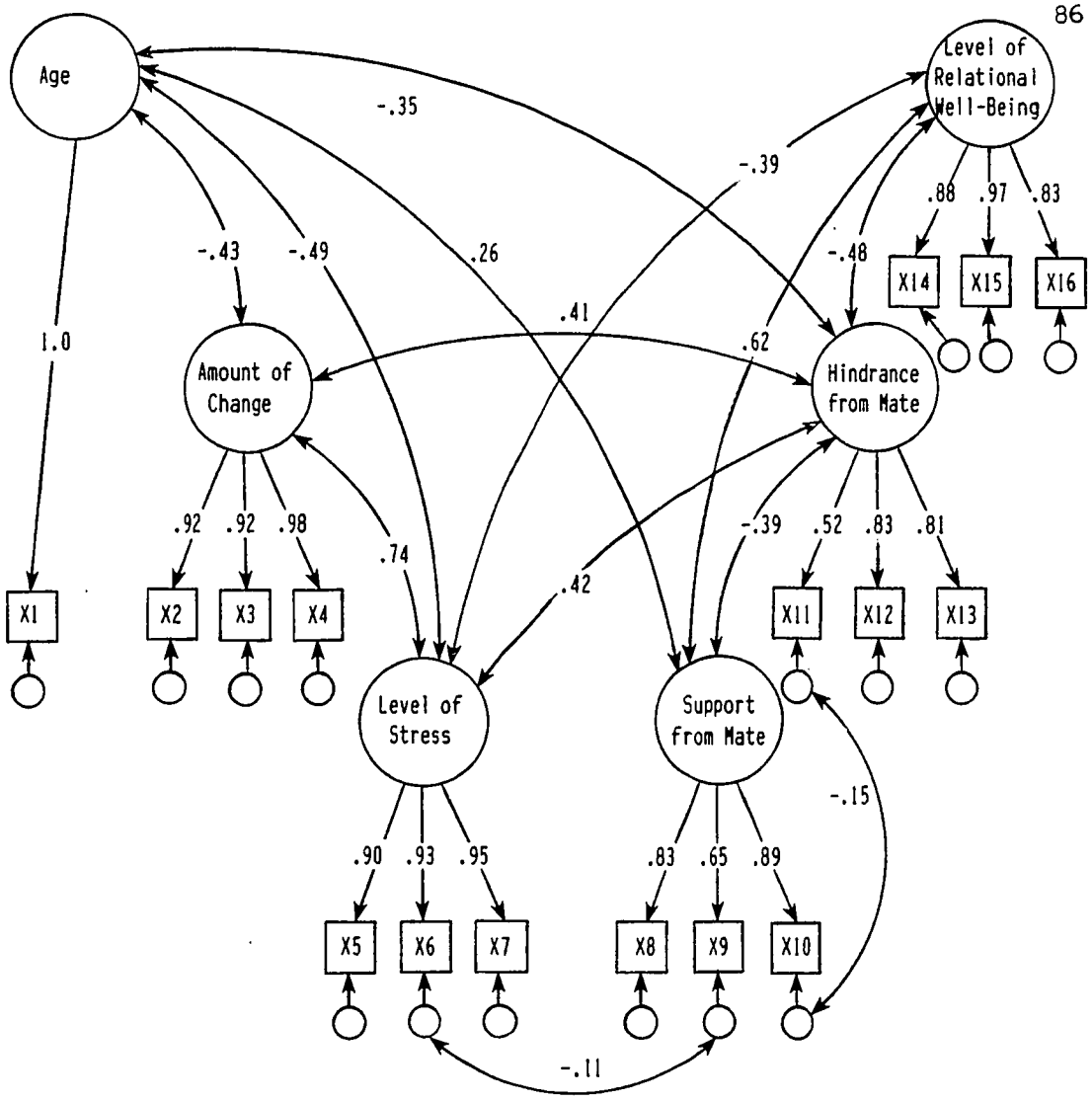
X4 = Amount of Perceived Change (Method 3)
X5 = Level of Perceived Stress (Method 1)
X6 = Level of Perceived Stress (Method 2)
X7 = Level of Perceived Stress (Method 3)
X8 = Informational Support from Partner
X9 = Tangible Assistance from Partner
X10 = Emotional Support from Partner
X11 = % of Time Arguing with Partner
X12 = Emotional Hindering from Partner
X13 = Informational Hindering from Partner
X14 = Level of Depressed Affect
X15 = Level of Positive Affect
X16 = Level of Enervation

[a]Psychological health assumed a negative valence in this model and hence reflected negative affect

Overall Goodness-of-Fit of the Model

Chi-square	df	p	GFI	AGFI	RMR
101.06	87	p = .144	.882	.800	.057

Figure 6. Final Submodel of Correlations Among Partners' Psychological Health Outcomes



X1 = Age
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X12 = Emotional Hindering from Partner
X13 = Informational Hindering from Partner
X14 = Satisfaction with Relational Adaptation
X15 = Satisfaction with Relational Cohesion
X16 = Satisfaction with Relational Affection

Overall Goodness-of-Fit of the Model

Chi-square	df	p	GFI	AGFI	RMR
103.34	88	$p = .126$	.884	.791	.049

Figure 7. Final Submodel of Correlations Among Partners' Relational Well-Being

Chapter 4

Discussion

This study was undertaken to understand the role of communicated support from one's mate in the management of illness stress, and further, the relationships between support, stress, and recovery outcomes in response to a cardiac illness event. Of the two main hypotheses, one was supported: stress was associated inversely with recovery outcomes. The other central hypothesis--that support was associated positively with recovery outcomes--was not supported consistently for patients' and partners' physical, psychological, and relational recovery outcomes. The main objectives of this final chapter are as follows: (a) to discuss the findings--first, the reliability and validity of the measurement of each unobserved latent dimension, and second, the associations among the major dimensions--stress, change, social support, and recovery outcomes, (b) to compare the similarities and differences between the patients' and partners' responses to the illness event, and (c) to point out limitations and directions for future research.

Some scholars would question the legitimacy of using confirmatory factor analysis (LISREL) with a sample of this size (Bearden, Sharma, & Teel, 1982). Because of the relatively small sample size, it is likely that the recovery submodels were over-fit, suggested by the high p values associated with the chi-square results obtained. Further, the procedures used in this study to delete variables were, at times, more data driven than theory driven; and these procedures stack the deck in favor of good fitting recovery models with minimal correlated error. As

a result, the findings are tentative and the study needs to be replicated in a sample that is at least twice as large as the present sample before one can have confidence in the results. Once an appropriate sample size is obtained, the theoretic models proposed in Chapter I could be estimated separately for patients' and partners' outcomes of the recovery process. Respecifying the models to achieve a good fit would be guided primarily by substantive theoretic considerations and the diagnostics from the LISREL output.

Measurement Model Considerations

Social support. In comparison to previous research which typically measured the amount of hypothetical support available, this study was designed to measure the individuals' assessments of the actual exchanges of support in response to the illness situation. Valid and reliable reflectors of social support in this study were the helping aspects of three main indicators: instrumental, informational, and expressive support. In contrast to earlier studies in which instrumental and expressive support were separate factors (Fiore, Coppel, Becker, & Cox, 1986; Lin, 1986), these results showed that informational, instrumental, and expressive indicators were all reflectors of one global dimension of support. This finding is similar to the results reported by Brown (1986a). Although support was reflected, reliably and accurately, by informational, expressive, and tangible assistance, combining them into a global measure of partner support does not allow the testing of the differential effects of social support. This is an important endeavor for future research.

The second dimension of support, termed partner hindrance, was reflected by only one reliable and valid indicator for the patients: time spent in disagreements. Scores from the other three potential indicators of partner hindrance, hindering aspects of informational, expressive, and instrumental support, had minimal variance and could not be analyzed. Perhaps patients were reluctant to rate hindering aspects of support from their spouses particularly if they were still dependent upon their partners and not yet fully recovered. Whatever the reason, a different method of measuring hindering aspects of support would be useful in future research. For the partners, however, hindrance from the mate was reflected not only by time spent in disagreements but also by hindering aspects of informational and expressive support. These women did not report hindering aspects of tangible assistance from the patients. Any amount of tangible assistance offered by the patient may be viewed by the partner as helpful rather than hindering based on the assumption that the demands on her time and energy are greater now to prepare special foods, provide transportation, and so forth.

Measurement of stress. The meaning of stress was reflected in the individual's perceived difficulty or bothersomeness produced by changes in the amount of exercise, diet, smoking, self-image, symptoms, Type A behavior, illness uncertainty, and medications. Further, it was reflected by perceived difficulty produced by changes in usual work activities, family roles, sexual activities, income, independence, and relational expectations. Thus, stress was the aggregation of the difficulty associated with all of the illness-related individual and relational changes and experiences.

Measurement of recovery outcomes. What constitutes and how to assess a positive and complete recovery plagues health care providers who strive to help individuals achieve an optimal quality of life after an illness event. One of the important contributions this study makes is to knowledge about recovery. The extent to which patients recovered from the cardiac illness event was by and large a physical recovery outcome reflected by the patient's perception of his heart condition, his current physical health status, and the extent of recovery. Although other indicators were hypothesized to reflect the patient's level of physical recovery outcomes--ability to perform usual activities, satisfaction with activity levels, and objective activity levels in kcal/wk--these indicators reflected a separate dimension labelled the level of physical activity.

The greatest dissimilarity between patients and partners was found in the meaning attributed to the physical health dimension. For the partners, physical health outcomes meant satisfaction with activity levels in addition to the level of physical health. For the patients it meant the status of his heart, the extent of recovery, and the level of physical health. Past investigators (Cass Principal Investigators & Associates, 1983; LaMendola & Pellegrini, 1979; O'Connor, 1983; Penckofer & Holm, 1984; Radley & Green, 1985) have operationalized physical recovery as the level of functional status; yet the findings of this study suggest that physical recovery, from the patient's perspective, is clearly different from functional status, at least in the first few weeks after discharge.

For the patients, valid and reliable indicators of psychological recovery outcomes were the level of positive affect, the level of depressed affect, and the level of psychological well-being. The level of enervation was hypothesized initially to reflect psychological recovery outcomes. However, items on the enervation scale--trouble sleeping, can't get going, everything an effort, no appetite, and trouble concentrating-- are similar to typical postoperative experiences that cardiac surgery patients have. These experiences, as usual sequela of the surgery rather than aspects of depression, were deleted as indicators of the patient's depression. Further, the results of the confirmatory factor analysis indicated that the level of enervation was a shared indicator of physical and psychological recovery outcomes for patients. For the partners, valid and reliable indicators of psychological health outcomes were the level of positive affect, the level of depressed affect, and the level of enervation.

Valid and reliable reflectors of relational recovery outcomes were the level of satisfaction with (a) relational adaptability--negotiation, assertive, decision making, criticism, roles, and rules, (b) relational cohesion--emotional bonding, boundaries, time, space, friends, and fun, and (c) relational affection. Relational commitment and equity were operationalized to reflect relational well-being because it was hypothesized that greater spouse perception of the probability of an enduring relationship and equity in the relationship would associate positively with relational satisfaction. However, neither indicator was linked significantly in the patient's measurement model and relational equity only was a significant reflector for the partner's relational

well-being. In an attempt to keep the indicators the same across patients' and partners' models of physical, psychological, and relational outcomes, the level of equity was not analyzed further.

Measurement of change. The amount of change was reflected, reliably and accurately, by the individual's perception of the amount of illness-related change in the following areas: exercise, diet, self-image, symptoms, Type A behavior, illness uncertainty, work/retirement activities, family roles, sexual activities, income, dependence (patients)/independence (partners), and relational expectations. However, to achieve reliable indicators of change, the direction of change--whether the behavior had increased or decreased--was ignored and the absolute amount of change was used to calculate perceived change. About one-third of the participants interpreted the questions about the amount of change differently than the investigator intended, reducing the validity of the change measurement. For example, individuals might have decreased their dietary intake of fat, cholesterol, and calories, but because they had increased behaviors related to their diet--measuring food portions, counting calories, reading labels--they would mark it increased. Future research would benefit from assessing not only the individual's perception of the absolute amount of change but also positive and negative elements of change.

Associations Between Stress and Social Support

Within Lazarus' (Lazarus & Folkman, 1984) stress model, social support is very important as a demanding illness situation unfolds because support is one of the mechanisms through which stress can be reduced and a positive sense of well-being can be maintained. In this

study, a cardiac illness event and the stress associated with it were hypothesized to be related positively to social support such that the greater the stress the greater the support. For patients, however, an inverse relationship was found meaning that greater stress levels were associated with less perceived support from the partner. Stated differently, higher levels of informational, instrumental, and expressive support from the spouse were associated with lower stress levels for patients. This finding is both in agreement (Bloom, 1982; Bramwell & Whall, 1986; Brown, 1986b; Kobasa & Puccetti, 1983) and in disagreement with previous research (Barrera, 1981; Belle, 1982; Cohen & Hoberman, 1983). What is yet to be resolved by further research is not only the valence but also the direction of causality between social support and stress. Although the confirmatory factor analysis was not used in this study to determine whether stress elicits social support or vice versa, these dimensions were found to covary. Theoretically, both causal directions are plausible and worth exploring, especially in light of recent attempts to establish supportive interventions for highly stressed individuals (Coyne & DeLongis, 1986). Because stress investigators are preoccupied with severely taxing events, typically the stressor precedes the provision of support (Kanner, Coyne, Schaefer, & Lazarus, 1981; Lazarus & DeLongis, 1983). When stress is viewed as a determinant of receiving social support, the stressful event is assumed to occur before social support is required or provided, the relationship being a positive one. Another way to interpret this relationship is that greater levels of stress may deteriorate the perceived availability of social support (Barrera, 1986). It is likely, however, that there is

a nonrecursive, cyclical relationship between these two variables, the valence and direction of the relationship to be determined by future studies.

Levels of stress were hypothesized to associate positively with partner support for the women also. However, the women's stress levels were not associated with their perceptions of informational, instrumental, and expressive support from the husband. There are several reasons why stress and partner support were not linked in the women's experiences. First, there is, most likely, a normative expectation for ill persons to be exempt from providing support to others during a recovery period, particularly a time-limited one. Second, these women might have received the same amount of support from their partners during this stressful situation as under normal conditions. However, because the women had additional demands and responsibilities to manage during this time, they were in need of extra support resources to meet these demands. In support of this argument, women's perceived stress levels were equal to or greater than the patients, yet these women received only moderate levels of support from the patients compared to high levels of partner support reported by the patients. It might be unrealistic for patients to provide the extra support resources to fill the gap for the women; but they might not turn to the patients anyway for additional support. Past research documented that wives, in contrast to their husbands, were less likely to rely primarily on their spouses as confidant and to report feeling understood and affirmed by their spouses (Vanfossen, 1981). For managing problems, women generally tend to benefit more from contact with other female

friends and relatives and from involvement in formal and informal groups (Belle, 1987). Examination of the bivariate correlations between husband support, other support, and the women's' levels of stress, change, positive affect, and depressed affect revealed that partner support associated with the women's experiences more than support from other close confidants (see Table 16, Chapter 3). The "other supporter" for two-thirds of the women was a male, usually an adult family member, and the women might not have felt as comfortable disclosing to or seeking help from a male as compared to a female. More importantly, however, bivariate correlations do not evaluate fully the true epistemic nature of the associations between support from other confidants and the women's stress levels. Hence, whether or not support from other close confidants would have been linked with the women's experiences awaits testing in future research.

A third explanation for the lack of association between partner support and stress levels for these women centers around the indicators used to reflect partner support. It can be argued that the women's satisfaction with the support received from the patient, even though it was the same or less support than usual, might be a more pragmatic expectation for the partner to have of the patient at this time. Support may have demonstrated a different pattern of results in the partner's experience if satisfaction with support had been used rather than the amount of informational, instrumental, and expressive support from the patient.

A final explanation is the factor that women's socialization prepares them to recognize and assume responsibility for others' needs

better than their own needs (Belle, 1987). Because the problematic situation is the husband's illness, these women might not expect support from their partners, might consider it inappropriate to ask for help, or feel it is a sign of personal weakness to receive support when they are not the ones who are sick. Additionally, because the husband's illness is more salient than what the partner is experiencing, friends and family members may overlook the needs of the well spouse, particularly if there is no outward evidence of distress. Indeed, Dunkel-Schetter and associates (1987) found that less tangible aid was received from other close confidants when a stressful experience posed a threat to a loved one's health. Based on the available data, it appears that these women are managing the stress associated with the illness on their own. However, other support variables not examined in this analysis, such as satisfaction with support from the mate or support from other members of the social network, were not evaluated fully and might link significantly with the women's stress levels. Although it would seem that support is particularly important for the women under these circumstances, there is no evidence that it is provided more frequently.

Physical Recovery Outcomes

The desired outcome of the recovery process is to return the cardiovascular patient and his or her family to an optimal level of physical, psychological, social, and vocational functioning in addition to retarding the progression of the underlying heart disease for the patient (Winslow, 1982). Factors that link with improved physical well-being for patients and partners after a cardiac illness event have not been documented consistently. In this study, physical recovery outcomes

were theorized to associate positively with social support from the partner and negatively with the difficulties and changes associated with the illness. For the patients, greater physical recovery outcomes were associated with older age, less stress, and greater levels of physical activity (see Figure 2, Chapter 3). This means that with advancing age and fewer difficulties associated with the illness situation--for example, with changes in exercise, diet, sexual activities, uncertainty about whether the illness might recur, and so forth--the greater the patient's perception of his physical recovery. Also, it means that higher levels of satisfaction with and ability to work at usual tasks and activities around the house and at work was associated with higher levels of physical recovery outcomes. This finding underscores the importance of early, progressive ambulation for patients recovering from a heart condition and reinforces the need to provide patients with either individualized exercise prescriptions for an at-home program or exercise monitoring in a structured setting. It is yet to be determined, however, whether the level of activities the patient is satisfied with during the initial stages of recovery are at a high enough intensity to reduce his risk for secondary heart disease and whether patients are able to maintain or increase this intensity to a satisfactory level. Alternatively, lower levels of physical recovery outcomes were correlated with higher levels of stress, younger age, and lower levels of physical activity. There may be a physiological link between stress levels and physical recovery outcomes. High levels of psychosocial stress, particularly prolonged stress, have been linked with the development of coronary artery disease (Henry & Meehan, 1981).

Henry and Meehan (1981) argued that individuals with coronary artery disease (CAD), compared to those without CAD, were sensitive and vulnerable to stress and manifested more anxiety and anger, emotions associated with catecholamine and cortisol excretion. Hence, the harmful effects of prolonged stress might still be playing a role in associating with lower physical recovery outcomes.

For the partners, lower stress levels were associated with increased physical health outcomes. This suggests that the fewer difficulties the partners perceived with the illness situation--for example, with changes in diet, family roles and expectations, uncertainty about whether the illness might recur, and so forth--the greater the women's perceptions of their physical health and satisfaction with activities.

Partner support and physical recovery outcomes. Contrary to expectations, the level of partner support was not associated directly with physical recovery outcomes for either the patient or the partner. There are variety of reasons why social support did not covary with either the patient's or the spouse's level of physical recovery. (Surprisingly, support did not link with the patient's level of physical activity either). First, when past researchers have referred to the beneficial effects of social support on physical recovery, these recovery variables have been very broad in scope ranging from health promotion or compliance behaviors (Brownell & Shumaker, 1984) to the spouses' perception of the illness being over (Finlayson, 1976). Past research evidence supporting an association between social support and physical recovery is not as strong as it was thought to be (Wallston,

Alagna, DeVellis, & DeVellis, 1983) and was challenged further by the results of this study.

Second, the physical health variable was tied primarily to bodily factors and, for the patients, to internal (heart condition) bodily factors. Failure to confirm a direct relationship between partner support and physical recovery might have been due to the persons' perceptions that only they could do things which would improve their own bodily condition. That is, physical health and physical healing for the patients most likely would have to come from within and evolve over time. More knowledge is needed about the exact meaning of the dimension of physical health and what it entails for these individuals. For example, what role does the presence, absence, or intensity of physical symptoms play in a person's perception of his/her physical health?

For the patients, another explanation for the lack of association between partner support and physical recovery might be related to the "boomerang effect" identified by Coates and Wortman (1979). If the helper wants to control the behavior and mood changes of the recipients of help rather than helping them regain control of their own situation, the likelihood of a boomerang effect is increased (Coates & Wortman, 1979). Although attempts to control the behavior and moods of others were not examined directly in this study, perhaps the boomerang effect cancelled out the proposed positive relationship between social support and physical health. Partners feel responsible for their husband's health outcomes while they are recuperating (Nyamathi, 1987) and are concerned with maintaining a level of activity that will not result in dependency or overexertion for the patient. This sense of

responsibility may be an issue of control or overprotection for some partners. Past investigators documented that one of the most common worries patients voice after a cardiac illness event is being overly dependent on their spouses (Stanton, Jenkins, Savageau, Harken, Aucoin, 1984). O'Connor (1983) found that patients with better perceptions of their health postoperatively were those who did not report the spouse's fear of injury as a barrier to recovery.

During the initial phases of recovery, patients generally required physical assistance in many activities of daily living: bathing, dressing, getting in and out of bed, transportation, and so forth. This is in addition to preparing special foods necessitated by the dietary changes and going for walks with the patient. The mean levels of tangible assistance that patients reported receiving from their partners were high and this variable by itself might have linked significantly with physical recovery outcomes rather than the total amount of instrumental, informational, and expressive support. Conversely, emotional support may not be conducive to physical recovery if instead the situation calls for getting another person to act or increase activity levels. Ultimately, the value of support depends on the context of the situation and how well the support provided matches the needs of the support recipients (Cohen & McKay, 1984; Folkman & Lazarus, 1988).

Psychological Recovery Outcomes

Another important dimension of recovery for both patients and partners was their psychological well-being reflected primarily by the amount of depression reported. For patients and partners, greater

psychological recovery outcomes were associated with older age, fewer illness-related changes, lower levels of stress, and less partner hindrance. This means that advancing age, less partner hindrance, and fewer difficulties and changes associated with the illness situation were associated with a positive attitude about the future and a lower incidence of feelings of sadness, depression, loneliness, and the like. Compared with amounts of change, social support, and partner hindrance, stress was the strongest correlate of psychological recovery outcomes for both patients and partners. One additional factor for patients associated significantly with higher levels of psychological well-being, namely greater partner support.

Partner support and psychological recovery outcomes. Only for patients was greater partner support associated with higher levels of psychological recovery outcomes. For the patients, the receipt of tangible aid and messages of advice, love, and caring from the partner was associated with a positive mental outlook and minimal feelings of depression. The beneficial effects of social support and reduced stress on psychological recovery is in accord with prior research (Bloom & Spiegel, 1984; Funch & Mettlin, 1982; Telch & Telch, 1986).

In contrast, support from the patient was not related to the women's psychological well-being. Reasons for this lack of association are similar to the lack of association between the women's stress levels and support from the patient. When partners were asked, "Who are the persons who have helped you manage your situation during this time of recovery," very few mentioned their mates. It may be that the partners do not ask for and do not expect support from their mates during this

time. Also, many partners reported that help from all sources was sought out and offered primarily during the hospital stay and not during the recovery. Dhooper (1984) similarly reported that instrumental and emotional help were available to partners during the hospitalization but not a month later during the recovery period.

Relational Outcomes

The immediate convalescent period is often a time heightened relational uncertainty, when new family roles, rules, and responsibilities become necessary for the husband and wife. Greater relational outcomes were associated with two factors for both patients and their partners: greater partner support and less partner hindrance. These findings were documented by several investigators in past research (Bradford, 1981; Burke & Weir, 1982; Cronenwett, 1985; Mayou, 1984; Schafer, McCaul, & Glasgow, 1986). These findings support uncertainty reduction theory (Albrecht & Adelman, 1984) in that with partner support, the recipient was more likely to feel supported and to know how to relate to the partner in this changed situation.

Stress and relational outcomes. An unexpected finding was that the patients' stress levels were not associated with their relational well-being. This suggests that patients were able to compartmentalize or internalize their illness stress in such a way that it was related only to their physical and mental health and not their relational well-being. They did not appear to make stress a relational issue.

On the other hand, greater stress levels were related significantly to reduced relational well-being for the partners. For the partners, this suggests that higher levels of perceived difficulty

produced by changes in life-style, family roles and expectations, and illness uncertainty, were associated with lower relational satisfaction. Stated differently, lower levels of satisfaction with relational factors such as criticism, decision making, roles, rules, boundaries, and so forth, were associated with greater difficulties associated with the illness. The partners' stress levels were associated significantly with their physical, psychological, and relational well-being suggesting that the illness is much more contextual for the partner, spilling over into all aspects of her life. Alternatively, this pattern of associations between the partners' stress levels and all three types of well-being may indicate "involvement in a nonproviding primary relationship that is likely a source of stress in itself and that is often a limitation on the ability to seek support elsewhere" (Coyne & DeLongis, 1986, p. 455).

Partner support and relational outcomes. Higher levels of partner support were associated with greater relational well-being for both patients and their partners. This finding suggests that greater relational satisfaction with all aspects of the relationship, particularly, adaptability, cohesion, and affection was linked with higher levels of expressive, instrumental, and informational support. Couples who reported higher levels of these three types of supportive messages might have experienced concomitantly less mutual uncertainty about the illness situation and about one another in this new and changed situation and perceived more options within which to view the interpersonal relationship. Folkman and Lazarus (1988) stated that the function of these types of supportive messages might be to engender a more favorable cognitive appraisal of the situation.

Associations Between Partner Hindrance and Partner Support

For the partners but not the patients, greater amounts of support from the mate were associated with less partner hindrance. For the women, this means that greater amounts of instrumental, informational, and expressive support from the patient were associated with less time spent in disagreements, less informational hindering, and less expressive hindering. One reason why patients and partners demonstrated a different pattern of associations between these two variables might be related, in part, to gender differences in the meaning of arguing. Weiss (1985) found that men keep control of expressing their feelings except for anger. This behavior appears to have its origins in the workplace but is thought to extend into the home as well (Weiss, 1985). Hence, for men more than women, an angry outburst is an acceptable, culturally sanctioned way of dealing with the stresses and changes associated with the illness. Further, to the men, release of emotions and frustrations through disagreements with the spouse is not a major factor in the patient's experience; at least it does not link with his perception of support from his spouse. In contrast, partner hindrance and partner support were linked negatively for these women. For the women, anger and disagreements are rarely considered an acceptable way of expressing emotions or frustrations. These women's perceptions of support from the mate appeared to be colored by time spent in disagreements and informational and expressive partner hindrance. The woman might perceive disagreements and hindrance from her partner as disapproval or rejection of her support efforts and, ultimately, rejection of her. Stated differently, greater levels of expressive,

informational, and tangible aid from the patient were associated with lower levels of partner hindrance for the women. Alternatively, this suggests that with greater amounts of support, these women might perceive that they have more information by which to understand, function, and validate feelings and fears in the situation, all of which would appear to reduce the likelihood of chances for disagreements.

Associations Between Partner Hindrance, Stress, and Recovery Outcomes

For both men and women, greater levels of partner hindrance were associated with lower levels of psychological and relational well-being, and higher levels of stress. For patients and partners this suggests that greater time spent in disagreements was associated with the person's perception of more illness-related hardships and difficulties, greater levels of depression, and less satisfaction with relational adaptation, cohesion, and affection. Greater stress and hindrance might be linked positively because with greater stress levels, there are more potential factors about which to disagree and people's tempers might flare more easily than under normal circumstances. In addition, disagreements are likely to generate misperceptions or misunderstandings about the situation or one another's role in the situation, both factors conducive to more stress.

Past research documented that topics of arguments for cardiac patients and partners revolved around conflict over the meaning of physician's instructions (Nyamathi, 1987) and the patient's perception of the spouse being overprotecting, controlling, or fearful of the patient's injury (Gilliss, 1984; O'Connor, 1983). Although this study did not examine topics of arguing per se, these same above mentioned

factors might be factors linking with greater stress levels and lower psychological and relational well-being for both members of the dyad. Folkman and Lazarus (1988) found that arguing was associated with high levels of depressive symptoms and suggested that perhaps people high in depression use more arguing and confrontational types of messages. Future research examining the types of messages exchanged, topics of disagreements, and how disagreements are resolved would provide more information about how interpersonal relationships link with levels of stress and psychological and relational well-being.

Amount of Change

It was hypothesized that the total number of changes in life-style, family roles and expectations, and other illness factors would associate inversely with recovery outcomes and positively with stress levels. In relation to recovery outcomes, greater amounts of change were associated with decreased psychological recovery outcomes for the patients and partners. Further, a greater number of changes were linked indirectly to the patient's physical recovery outcomes by associating with reduced levels of physical activity. In relation to stress levels, greater amounts of change were associated with increased levels of stress for both patients and partners. The purpose of this study was not to determine whether change elicits stress or vice versa. Although it is assumed frequently that greater amounts of change result in higher levels of stress for individuals, it is just as plausible to propose that greater amounts of stress result in greater numbers of changes. For example, it may require a certain threshold or a high enough level of stress for some individuals to realize the importance and necessity

of behavioral and life-style changes and, further, to implement these changes.

The association between the partners' stress levels and the number of changes experienced was high (r=.73) and suggests that the partners' stress levels were strongly linked to the total number of changes they reported. For the partners, there also was a positive feedback loop between the total number of changes, the level of stress, and partner hindrance indicating that greater amounts of change were associated with greater levels of partner hindrance which, in turn, was associated with greater levels of stress. The total number of changes made by the partners could be conceptually closer to a "contagion effect" or the stress that the partners experience from the intensity and amount of social support demanded by the patient (Albrecht & Adelman, 1984). Partners change their behaviors, quit smoking, or start exercising as supportive gestures, unlike patients who make these same changes for quite different reasons. And, the more changes that the partner reported, the greater the partner hindrance exchanged within the relationship (r=.41). The couple may be disagreeing about how much and what kind of change is necessary to benefit the patient's future health.

Age

Lazarus and DeLongis (1983) stated that many of the age-related changes in sources of stress and psychological well-being result, in part, from a shift in how events are appraised by a person rather than solely from changing circumstances. In support of that statement, the findings in this study imply that aging individuals experienced fewer changes, less stress, greater psychological recovery outcomes, and

greater partner support. In addition, from the partner's perspective, aging was associated with less relational conflict. Costa and McCrae (1980) suggested that health expectations decline with age, regardless of health status: "Conditions like fatigue after exercise, considered medically significant by younger people, may be regarded as a normal part of aging by the elderly, ...[who] may show a realistic concern for their health without a greater number of complaints" (p. 254.). Further, Lazarus and Delongis (1983) suggest that older individuals may be able to look upon their condition with some degree of philosophical detachment in order to continue to regard themselves with dignity. In all likelihood, younger individuals also might experience a reduced expectation of their future abilities to live, love, and work to their fullest potential.

Limitations and Suggestions for Future Research

One of the main drawbacks of estimating separate models of physical, psychological, and relational recovery processes is that it is yet to be determined if participants view all dimensions of recovery as being equally important. Within this theory of adjustment to a life-threatening illness, additional elements of adjustment that require documentation are the interrelationships between the different dimensions of recovery as well as the patterns of associations among all the variables. Other limitations of the present study are pointed out within the context of future research directions.

First, given the cross-sectional design of this study, the results of the data were limited to patterns of association. At the same time, the findings allowed comparisons to be made between male patients and

female partners in human responses to an illness event. Although the same measurement model of levels of change, stress, support, and health outcomes was supported for both men and women, there were many differences between these two sets of participants in their patterns of responses. For the patients, partner support associated with their levels of stress and psychological and relational recovery; but for the women, partner support associated only with their relational well-being. These findings raise several questions for future study. Is there an important dimension of support from one's mate for both men and women that associates with their physical health? Is the cardiac patient providing some aspect of support that is related significantly to his spouse's physical and psychological well-being and stress levels? Is it realistic to expect that these women be getting support from the cardiac patient during this time period? Are these women receiving support from someone else in their social networks that accounts for the support gap in the marital relationship? These and other questions need to be addressed in future studies.

More importantly, longitudinal studies are needed to scrutinize the limitations of the cross-sectional data in this study. Over time data are needed to supply information about whether the same factors that are important in the short term for linking with health outcomes are also important for long term health outcomes of patients and partners. Past research evidence suggested that lifestyle and family role changes, set in motion at the initial onset of the illness, were still present one year later (Croog & Levine, 1977). Hence, longitudinal studies are warranted because initial patterns of response

to an illness, whether adaptive or maladaptive, might remain with the individual indefinitely after the illness event.

Second, this analysis was based on the responses of 94 patients and 85 partners. This small sample size is inadequate for the optimal use of confirmatory factory analysis. Because of the small sample size, the findings contained herein are tentative and the study needs to be replicated with an appropriate sample size for validation purposes. A minimum of at least 200 subjects is needed to assure sufficient degrees of freedom to fit the measurement model to the data (Beardon, Sharma, & Tell, 1982). With a small sample, chi-square values become less reliable as an indicator of goodness of fit and the high p values obtained reflect overfitting of the physical, psychological, and relational recovery models (Beardon et al., 1982). Further, decisions to drop variables from a dimension need to be theory driven primarily rather than data driven. Finally, the preliminary strategies utilized, exploratory factor analysis, to delineate two to three of the most salient indicators with high factor loadings for each dimension were arguable also.

Third, another limitation of this study was the inability to examine the two dimensions of stress initially hypothesized, namely individual and relational stress levels, in light of the recovery outcomes. The results of the confirmatory factor analysis indicated numerous shared paths and correlated error terms among these two dimensions of stress so they were merged into one total stress scale. Although total amounts of stress were very central to the recovery processes of these patients and partners, information is needed also

about patterns of associations between specific stressors, for example life-style changes or family role changes and outcomes of the recovery process. Just because individuals experiences stress or change in one aspect of their lives, such as dietary changes, does not mean they will experience it in another, such as family role changes. It is yet to be determined whether it is the total amount of stress or certain types of stress that are particularly difficult and bothersome for individuals after a cardiac illness event.

Fourth, understanding the influence of significant interpersonal relationships on the health outcomes of both members is important for constructing theories of adaptation to a life-threatening illness. This seems particularly important because the spouse or partner often is the most important person in the ill person's adjustment. Further, spouses are admonished, albeit covertly, to make the same life-style changes as their partners, to provide day-to-day positive reinforcement for their partners' changes, and to make certain the patient complies with all risk factor modifications (Dracup, 1983). However, health care providers expend surprisingly little effort to train spouses in how to help or care for the patient even though the impact of caregiving on both individuals appears to be great. Another limitation of the study is that many of the relational aspects of the illness situation, relational satisfaction, partner support, partner hindrance, and relational stress factors were examined using the individual as the unit of analysis. Another way to evaluate these factors is to examine the couple as the unit of analysis. The couple as the unit of analysis might yield more information about transactional features of the

relationship--how messages of advice, information, love, and affirmation are exchanged, how disagreements or conflicts are managed and resolved, and how offers of tangible aid are accepted or rejected. Future studies would benefit from collecting data from other supporters also, both health care providers and close confidants, to evaluate the veridicality between perceptions of recipients and providers of support. This is particularly important in light of findings that social support is influenced a great deal by cognitive perceptions within the person such as transitory mood, well-being, and attitudes (Gottlieb, 1985).

Summary

The study was designed to examine the various relationships among stress levels, social support, and recovery outcomes utilizing techniques of confirmatory factor analysis. Despite the limitations of this study, it is informative in that it links the centrality of social support and stress levels to the adjustment processes of both cardiac patients and their partners. Rehabilitation of individuals with coronary artery disease can be a lengthy process accompanied by a high incidence of psychosocial disability. It is known that social support plays an important role in cardiac rehabilitation, but information about which forms of support are most helpful is urgently needed because well-meaning people may offer ineffective or damaging types of support. Lin's (1986) typology of social support, while providing a global framework for the assessment of social support in this study, requires further examination and reassessment as a result of findings from this and similar studies.

Four main conclusions were suggested by the results of this study: (a) that increased support from the partner was associated with decreased stress levels for patients but not partners; (b) that greater nonsupportive exchanges between dyad members was associated with greater stress levels for both the cardiac patients and their partners; (c) of the factors considered, stress was the strongest correlate of psychological recovery outcomes but partner support was the strongest correlate of relational well-being for patients and partners; and (d) different factors are associated with each of the different types of recovery outcomes. That is, greater levels of physical health were associated with lower levels of stress for both patients and partners, and with greater levels of physical activity and older age for the patients. Greater levels of psychological well-being were associated with four of the same factors for patients and spouses: greater age, less change, less stress, and less partner hindrance. In addition, it was associated with greater amounts of partner support for the patients only. Finally, greater levels of relational satisfaction were associated with higher amounts of partner support and partner hindrance. And, for partners, greater relational well-being was associated with less stress. Continuation of this research is warranted to yield more information about which forms of social support lead to patients' and partners' more rapid return to an independent, satisfying lifestyle and optimal levels of health.

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Appendix A

University of Washington
Consent Form (Version A)

Demands of Illness and Social Support after a Cardiac Illness

Investigator: Bernice Yates, R.N., M.S.
Doctoral Candidate
School of Nursing, SC-72
University of Washington
Seattle, WA 98195
(206) 545-8064

Investigator's Statement

Purpose and Benefits

You and your partner are being asked to participate in a study which involves one interview session at your convenience. The purpose of this study is to gain a better understanding of the experiences couples have while one member of the couple is recovering from a heart condition. I am interested in what people think about, how they feel, as well as what they do to recover from a cardiac illness event. The results of the study eventually will help nurses identify ways in which they can be more supportive and helpful to the families with whom they work. I am conducting this study in partial fulfillment of the requirements for a graduate degree in nursing.

Procedures

Participation involves a one and one-half hour interview with both you and your partner. During the interview, you will fill out some questionnaires and respond verbally to other questions. This interview will be conducted in your home or the place of your choice at a time and date that is convenient and comfortable for you. Questions will cover:

-the goals you've set for yourself as a result of the illness

-how much you've achieved your goals

-the activities you're performing and how you feel about your progress

-the experiences you're having associated with your illness

-the kind of support you're getting from others during recovery

-your day-to-day health practices

-what things have been helpful or hindering to your recovery.

I am also requesting permission to obtain information from your medical record (for patients only). Specifically, I am interested in obtaining information about your heart catheterization and any graded exercise tests you might have had after your hospitalization.

The personal nature of the questions may cause some mild emotional discomfort. However, you may refuse to answer any question during the interviews or on the questionnaires. Participation is completely voluntary. You may refuse to participate or may withdraw from the study at any time. There is no penalty or loss of benefits for refusing to participate. I will be happy to answer any of your questions.

The information you provide will be kept completely confidential. All questionnaires and interview information will be coded and no names will appear on the forms. It will be seen only by the investigator and will be reported only in group form; no individuals will be identifiable in any written report of this study. The study questionnaires will be kept in a locked file no longer than six years and then destroyed. A written report of the study will be placed in the University of Washington Library. There will be no reimbursement for your participation in this study. Your participation in this study will assist health care providers in helping couples like you recover from a heart condition.

_____

Signature of investigator Date

Participant's Statement

The study described above has been explained to me. I agree to take part in this study. I have had the opportunity to ask questions. I understand that future questions I may have about the research or about my rights as a subject will be answered by the investigator listed above.

_____

Signature of subject Date

_____

Signature of partner Date

Copies to: Subject
Investigator's file

Appendix B
Introductory Letter

University of Washington
Seattle, Washington 98195

Date

Mr. and Mrs.
Seattle, WA

Dear Mr. and Mrs. ,

I am a nurse in the doctoral program at the University of Washington. For my dissertation research, I am doing a study that involves all the patients who have undergone coronary artery bypass surgery at . The purpose of this study is to gain a better understanding of the experiences individuals have while they are recovering from a heart condition. In addition, I am interested in the experiences that spouses have during this time of recovery.

Participation involves a one and one-half hour interview with both of you in your home in about 4 weeks at a time that is convenient for you. Questions for both of you will cover:

-the goals you've set for yourself as a result of the illness

-the activities you're performing

-how you feel about your progress

-the experiences you're having as part of your heart condition

-your day-to-day health practices

-the kind of support you're getting from others during recovery

-what things have helped or hindered you during this time.

The information gained from this study eventually will help nurses identify ways in which they can be more supportive and helpful to the people with whom they work.

I, or one of my associates, will be calling you in about a week to invite both of you to participate in this study. Or, if you are interested in participating or have additional questions, please feel free to call me. Thank-you for your consideration of this request!

Sincerely,

Bernice Yates, R.N., M.S.
Doctoral Candidate
School of Nursing, SC-72
Work # 545-0834 or Home # 281-9205 (leave message)

Appendix C

Stress Questionnaire, Methods 1-3

Stress, Method 1

For each of the following items, place an "X" on the line to indicate how much the following changes have been stressful or bothersome SINCE YOUR HOSPITALIZATION. If not applicable, leave it blank. FOR EXAMPLE:

-NOT AT ALL STRESSFUL,
Not at all stressful|——————————————|Extremely stressful

-MODERATELY STRESSFUL,
Not at all stressful|——————————————|Extremely stressful

HOW BOTHERSOME SINCE YOUR HOSPITALIZATION:

1. Changes in amount of exercise
Not at all stressful|——————————————|Extremely stressful

2. Changes in diet
Not at all stressful|——————————————|Extremely stressful

3. Changes in smoking
Not at all stressful|——————————————|Extremely stressful

4. Changes in self-image
Not at all stressful|——————————————|Extremely stressful

5. Changes in symptoms
Not at all stressful|——————————————|Extremely stressful

6. Changes in Type A behavior
Not at all stressful|——————————————|Extremely stressful

7. Changes in usual work activities
Not at all stressful|——————————————|Extremely stressful

8. Changes in usual family roles
Not at all stressful|——————————————|Extremely stressful

9. Changes in sexual activity
Not at all stressful|——————————————|Extremely stressful

10. Uncertainty about if and when the illness will recur
Not at all stressful|——————————————|Extremely stressful

11. Changes in medications
Not at all stressful|——————————————|Extremely stressful

12. Changes in income
Not at all stressful|——————————————|Extremely stressful

13. Changes in amount of dependency
Not at all stressful|——————————————|Extremely stressful

14. Changes in relational expectations
Not at all stressful|——————————————|Extremely stressful

Stress, Method 2

PLEASE RESPOND TO EACH ITEM BELOW. Circle one number to indicate how much each experience has been stressful or bothersome SINCE YOUR HOSPITALIZATION. If not applicable, leave it blank.

	Not at all			Moderately			Extremely
1. Changes in amount of exercise	0	1	2	3	4	5	6
2. Changes in diet	0	1	2	3	4	5	6
3. Changes in smoking	0	1	2	3	4	5	6
4. Changes in self-image	0	1	2	3	4	5	6
5. Changes in symptoms	0	1	2	3	4	5	6
6. Changes in Type A behavior	0	1	2	3	4	5	6
7. Changes in usual work activity	0	1	2	3	4	5	6
8. Changes in usual family roles	0	1	2	3	4	5	6
9. Changes in sexual activities	0	1	2	3	4	5	6
10. Uncertainty about if and when the illness will recur	0	1	2	3	4	5	6
11. Changes in medications	0	1	2	3	4	5	6
12. Changes in income	0	1	2	3	4	5	6
13. Changes in amount of dependency	0	1	2	3	4	5	6
14. Changes in relational expectations	0	1	2	3	4	5	6

Stress, Method 3

PLEASE RESPOND TO EACH ITEM BELOW USING THE FOLLOWING:

From the [0], draw an arrow toward the [1] to indicate how much these experiences or changes have been stressful for you SINCE YOUR HOSPITALIZATION. If not applicable, leave it blank.

	Not at all stressful	Moderately stressful	Extremely stressful
FOR EXAMPLE:			
SLIGHTLY STRESSFUL	[0]		[1]
VERY STRESSFUL	[0]		[1]
NOT AT ALL STRESSFUL	[0]		[1]

HOW BOTHERSOME SINCE YOUR HOSPITALIZATION:

	Not at all stressful	Moderately stressful	Extremely stressful
1. Changes in amount of exercise	[0]		[1]
2. Changes in food intake	[0]		[1]
3. Changes in smoking	[0]		[1]
4. Changes in self-image	[0]		[1]
5. Changes in symptoms	[0]		[1]
6. Changes in Type A behavior	[0]		[1]
7. Changes in usual work activity	[0]		[1]
8. Changes in usual family roles	[0]		[1]
9. Changes in sexual activity	[0]		[1]
10. Uncertainty about if and when the illness will recur	[0]		[1]
11. Changes in medications	[0]		[1]
12. Changes in income	[0]		[1]
13. Changes in amount of dependency	[0]		[1]
14. Changes in relational expectations	[0]		[1]

Appendix D

Change Questionnaire, Methods 1-3

Amount of Change, Method 1

Below is a list of experiences and changes that some people go through when they are recovering from a heart condition. Please write in ONE number that indicates THE AMOUNT OF CHANGE SINCE YOUR HOSPITALIZATION. Also, write in a plus or minus sign to indicate whether you've increased (+) or decreased (-) the behavior. If not applicable, leave it blank.

---

greatly decreased — no change — greatly increased

-9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9

FOR EXAMPLE: IF GREATLY DECREASED _____

IF NO CHANGE _____

IF MODERATELY INCREASED _____

HOW MUCH CHANGE SINCE YOUR HOSPITALIZATION:

_____ 1. Amount of exercise

_____ 2. Diet (fat, cholesterol, calories)

_____ 3. Smoking

_____ 4. Self-image

_____ 5. Symptoms (for example--fatigue, pain)

_____ 6. Type A behavior (for example--hard driving, in a hurry)

_____ 7. Usual work (retirement) activities

_____ 8. Usual family role activities (decision-making, household tasks)

_____ 9. Sexual activities

_____ 10. Uncertainty about if and when the illness will recur

_____ 11. Number of medications

_____ 12. Amount of income

_____ 13. Amount of dependency on others

_____ 14. Amount of relational demands or expectations

Amount of Change, Method 2

PLEASE ANSWER THE FOLLOWING QUESTIONS AGAIN.

We are trying to discover if it is easier for you to respond to questions when given a different way of answering the question. From the "0" draw an arrow to indicate how much you've changed (increased or decreased) since your hospitalization. If not applicable, leave it blank.

FOR EXAMPLE:	greatly decreased	no change	greatly increased
NO CHANGE	[-1]	0	[+1]
MODERATELY DECREASED	[-1]	0	[+1]
GREATLY INCREASED	[-1]	0	[+1]

HOW MUCH CHANGE SINCE YOUR HOSPITALIZATION:

	greatly decreased	no change	greatly increased
1. Amount of exercise	[-1]	0	[+1]
2. Diet (fat, cholesterol, calories)	[-1]	0	[+1]
3. Smoking	[-1]	0	[+1]
4. Self-image	[-1]	0	[+1]
5. Symptoms (fatigue, pain)	[-1]	0	[+1]
6. Type A behavior (in a hurry)	[-1]	0	[+1]
7. Usual work/retirement activities	[-1]	0	[+1]
8. Usual family role activities (decisions, tasks)	[-1]	0	[+1]
9. Sexual activities	[-1]	0	[+1]
10. Uncertainty about if and when the illness might recur	[-1]	0	[+1]
11. Number of medications	[-1]	0	[+1]
12. Amount of income	[-1]	0	[+1]
13. Amount of dependency on others	[-1]	0	[+1]
14. Amount of relational demands or expectations	[-1]	0	[+1]

Amount of Change, Method 3

IMPORTANT: PLEASE ANSWER THE FOLLOWING QUESTIONS FOR THE LAST TIME.

Please indicate how much change, in percentage, you've made in the following areas since your hospitalization. Write in a number between 0 and 100%. Also, write in a plus or minus sign to indicate whether you've increased (+) or decreased (-) the behavior. If not applicable, leave it blank.

	HOW MUCH CHANGE SINCE YOUR HOSPITALIZATION? FROM: +100% to 0 to -100%
1. Amount of exercise	_____
2. Diet (for example--fat, cholesterol, calories)	_____
3. Smoking	_____
4. Self-image	_____
5. Symptoms (for example--fatigue, pain)	_____
6. Type A behavior (hard driving, in a hurry)	_____
7. Usual work (retirement) activities	_____
8. Usual family role activities (decision-making, household tasks)	_____
9. Sexual activities	_____
10. Uncertainty about if and when the illness will recur	_____
11. Number of medications	_____
12. Amount of income	_____
13. Amount of dependency on others	_____
14. Amount of relational demands or expectations	_____

Appendix F

GOAL ACHIEVEMENT INTERVIEW (Form P)

1. GOALS IN GENERAL

I'd like you to think back to around the time of your hospitalization (and shortly thereafter) and tell me what goals you set for yourself as a result of this heart condition? (Alternatively) What would you like to achieve as a result of having this heart condition?

Goals	Degree of achievement
a.	_____
b.	_____
c.	_____

FOR EACH GOAL:

If you were going to rate how much you've achieved each goal AT THIS TIME on a scale of 0 to 10 with 10 being total realization of the goal, how much have you achieved each goal?

Once the person has listed all the goals they can think of, specifically probe for the following physical, psychological, and relational goals or benefits they hope to gain. Avoid reiterating a goal the subject has already listed.

---

2. PHYSICAL GOALS

Other goals that people with a heart condition similar to yours have listed include relief of chest pain, or an increase in physical energy. Did you set any physical goals related to your heart condition? List. If so, how much have you achieved each goal at this time, from 0 to 10?

Goals	Degree of achievement
a.	_____
b.	_____
c.	_____

3. PSYCHOLOGICAL GOALS

Additional goals that cardiac patients have listed include peace of mind or greater self-confidence. Did you set any psychological goals as a result of your heart condition? List. If so, how much have you achieved each benefit at this time, on a scale from 0 to 10?

Goals	Degree of achievement
a.	_____
b.	_____
c.	_____

4. RELATIONAL GOALS

Other goals that cardiac patients have listed have to do with their family or marital relationships such as taking time to do things together or appreciating each other more. Did you set any relational goals as a result of your heart condition? List. If so, how much have you achieved each benefit at this time, on a scale from 0 to 10?

Goals	Degree of achievement
a.	_____
b.	_____
c.	_____

5. Now, I'd like you to weight the importance of each of the goals you've listed so that they add up to 10. The benefit or goal that you consider the most important would get the greatest weighting and so forth.

Goal #1	_____	Goal #5	_____
Goal #2	_____	Goal #6	_____
Goal #3	_____	Goal #7	_____
Goal #4	_____	Goal #8	_____

Appendix G

Cardiac Recovery Survey

These next few questions are about some of your CURRENT health practices and day-to-day living habits. Place an "X" on the line to indicate how much you are experiencing each of the following:

DURING THE PAST TWO WEEKS:

1. how often do you usually add salt to your food at the table?
   Not at all |——————————————————| Most of the time

2. how much fat would you say your diet contains?
   None at all |——————————————————| A great deal

3. how much fiber would you say your diet contains?
   None at all |——————————————————| A great deal

4. to what extent is your blood pressure reading normal or under control?
   Not at all |——————————————————| A great deal

5. how much do you feel under time pressure?
   Not at all |——————————————————| A great deal

6. I can work at my usual tasks--housework, office work, gardening?
   Not at all |——————————————————| A great deal

7. I feel restricted in the amount and type of activity I can do.
   Not at all |——————————————————| A great deal

8. I feel satisfied with the amount and type of activity I am able to do.
   Not at all |——————————————————| A great deal

9. the state of my physical health is:
   Extremely poor |——————————————————| Excellent

10. the state of my psychological health is:
    Extremely poor |——————————————————| Excellent

11. the state of my marital well-being is:
    Extremely poor |——————————————————| Excellent

12. my overall quality of life is:
    Extremely poor |——————————————————| Excellent

13. to what extent do you feel your partner has recovered from the illness?
    Not at all |——————————————————| Fully recovered

14. from what health care providers have said and done, what sort of condition would you say your partner's heart is in now?
    Extremely poor |——————————————————| Excellent

DURING THE PAST WEEK:

15. How many flights of stairs did you usually climb up each day?

_____flights/day (Let 1 flight = 10 steps)

16. How many city blocks or their equivalent did you regularly walk each day?

_____blocks/day (Let 12 blocks = 1 mile)

17. List any activities, sports or recreation you have participated in during the PAST WEEK. Please include only the time you were physically active (i.e., actual time spent in jogging, bicycling, swimming, brisk walking, gardening, carpentry, calisthenics, etc.)

Sport, Recreation, or Other Physical Activity	Number of Times per Week	Average Time per Episode Hours	Minutes
a.			
b.			
c.			

18. On a usual weekday and a weekend day, how much time did you spend on the following activities? Total for each day should add up to 24 hours.

	Usual Weekday Hours/Day	Usual Weekend Day Hours/Day
a. Vigorous activity (digging in the garden, strenuous sports, jogging, chopping wood, sustained swimming, brisk walking, heavy carpentry, bicycling on hills, etc.)		
b. Moderate activity (housework, light sports, regular walking, golf, yard work, lawn mowing, painting, repairing, light carpentry, dancing, bicycling on level ground, etc.)		
c. Light activity (office work, driving a car, strolling, personal care, standing with little motion, etc.)		
d. Sitting activity (eating, reading, desk work, watching TV, listening to radio, etc.)		
e. Sleeping or reclining		
TOTAL SHOULD ADD UP TO:	24 HOURS	24 HOURS

19. At least once IN THE PAST WEEK, did you engage in regular activity akin to brisk walking, jogging, bicycling, etc. long enough to work up a sweat, get your heart thumping, or get out of breath?

_____ No Why not? _____

_____ Yes How many times per week? Activity: _____

20. Compared to your usual activity level, how active were you DURING THE PAST WEEK?

less active than usual ├──────────────────────────────┤ more active than usual

21. Were you sexually active before your partner's hospitalization? ____ yes ____ no

22. Have you returned to sexual activity? _____ yes _____ no

23. How would you rate your satisfaction with your sexual activity compared to before your partner's hospitalization? Place an "X" on the line.

Not at all ├──────────────────────────────┤ Completely satisfied

24. Have you ever known anyone else who had heart disease or a heart condition? _____ yes _____ no

25. To what extent was the experience of knowing someone else with a heart condition positive or negative? Place an "X" on the line.

Very negative ├──────────────────────────────┤ Very positive

IMPORTANT: THESE NEXT TWO QUESTIONS ASK YOU ABOUT YOUR RELATIONSHIP WITH THE PERSON WHO IS INVOLVED IN THIS STUDY WITH YOU.

26. What is the chance that you will still be together with this same person three months from now? We know this is a tough question, but please think about it realistically and seriously. Think of a number between 0% and 100% to indicate the chance that you will be together three months from now.

Write in:_____% chance (0-100%) that the two of you will still be together three months from now

27. What is the chance that you will always be together with this person? We know this is a guess, but please try to think about it realistically. Think about what will probably happen--not just what you want to happen. Think of a number between 0% and 100% to indicate the chance that you will always be committed to this person.

Write in:_____% chance (0-100%) that the two of you will be partners "forever"

Appendix H

Self-Esteem Questionnaire

Self-Esteem Scale

Please indicate how much you agree or disagree with each of the statements below. There are no right or wrong answers, only your candid personal opinion counts. Read each statement carefully, but work quickly--give your overall response to each statement. USE THE FOLLOWING CODES:

---

1 = Strongly disagree
2 = Moderately disagree
3 = Somewhat disagree
4 = Neutral
5 = Somewhat agree
6 = Moderately agree
7 = Strongly agree

Write in the one number that best indicates how much you agree or disagree with each statement. Write your answers in the blanks to the left of each statement.

_____ 1. I feel that I have a number of good qualities.

_____ 2. I feel that I'm a person of worth, at least on an equal plane with others.

_____ 3. I am able to do things as well as most other people.

_____ 4. I take a positive attitude toward myself.

_____ 5. On the whole, I am satisfied with myself.

_____ 6. All in all, I am inclined to feel that I'm a failure.

Appendix I

Center for Epidemiological Studies' Depression Scale

Appendix L

Results of Factor Analyses of Indicators of Recovery Outcomes and Social Support

Table 13. Principal Components Factor Analysis for Patients' Recovery Outcomes (N = 78)

Variables	Factor 1	Factor 2	Factor 3	Factor 4	Communality
Current Relational well-being	.82	.23	.04	.06	.74
Relational Adaptation	.87	.18	.07	.10	.80
Relational Cohesion	.93	.17	-.03	.07	.89
Relational Affection	.80	.13	.17	-.05	.68
Marriage Forever[a]	.63	.09	-.21	-.02	.44
Equity[a]	.24	.08	-.03	-.13	.42
Current Psychological Health	.22	.78	.10	.20	.71
Depressed Affect	-.28	-.79	-.16	.08	.73
Positive Affect	.33	.73	-.10	.03	.64
Enervation	.09	-.69	-.42	.12	.67
Anxiety[a]	-.14	-.61	-.02	-.18	.42
Satisfied with Activity	.07	-.03	.73	.33	.65
Activity Restricted[a]	-.09	-.08	-.61	.01	.39
Level of Tasks	-.19	.20	.78	.15	.71
Current Physical Health	-.04	.44	.36	.65	.75
Amount of Recovery	.09	.20	.30	.71	.64
Heart Condition	.04	-.12	-.04	.89	.82
Eigen values	4.95	2.88	1.70	1.15	--
Percent variance	30.9	18.0	10.7	7.2	--

[a]Patient variables not entered into final submodels of recovery outcomes.

Table 14. Principal Components Factor Analysis for Partners' Health Outcomes[a] (N = 72)

Variables	Factor 1	Factor 2	Factor 3	Factor 4	Communality
Current Relational Well-being	.70	.37	-.08	.01	.64
Relational Adaptation	.90	.14	.02	.12	.84
Relational Cohesion	.86	.31	-.05	.13	.85
Relational Affection	.86	.14	-.04	-.16	.78
Marriage Forever	.57	.17	-.18	.47	.60
Equity	.70	-.11	.09	-.01	.51
Current Psychological Health	.27	.69	.25	-.21	.66
Depressed Affect	-.16	-.86	-.01	.02	.78
Positive Affect	.35	.72	-.06	.20	.67
Enervation	-.05	-.76	-.12	-.30	.69
Anxiety	-.09	-.72	-.14	-.13	.56
Current Physical Health	-.01	.44	.69	-.15	.69
Satisfied with Activity	-.21	.46	.55	.27	.63
Activity Restricted	-.03	.07	-.84	-.12	.72
Level of Tasks	.03	.14	.14	.84	.75
Eigen values	5.26	2.76	1.21	1.14	--
Percent variance	35.0	18.4	8.1	7.6	--

[a]Partner variables, with one exception, entered into confirmatory factor analysis. Level of tasks was not entered as a separate factor.

Table 15. Principal Components Factor Analysis for Patient's Perception of Partner Support (N = 88)

Type of Support	Factor 1	Factor 2	Factor 3	Communality
Information (Method 1)	.83[a]	-.01	-.01	.69
Information (Method 2)	.69[a]	.22	.14	.54
Tangible Aid (Method 1)	.51[a]	.54	.05	.55
Tangible Aid (Method 2)	.46[a]	.62	.28	.68
Expressive (Method 1)	.77[a]	.37	-.04	.73
Expressive (Method 2)	.69[a]	.47	-.08	.70
Closeness	.80	.38	.07	.79
Free Time Together	.62	-.09	.04	.40
Emotional Hindrance	-.07	-.71[b]	.15	.53
Time Spent Arguing	.02	-.78[b]	-.08	.61
Conflict Unrelated to Illness	.08	-.37	-.67	.60
Conflict about Illness	.14	-.22	.78	.67
Satisfied with Support	.48	.77	.11	.83
Committed to Helping	.49	.76	.03	.78
Reciprocity	.56	.31	.03	.41
Eigen value	6.65	1.71	1.16	--
Percent Variance	44.3	11.4	7.8	--

[a] Designates Factor 1 Assignment
[b] Designates Factor 2 Assignment

Table 16. Principal Components Factor Analysis for Partner's Perception of Support from Mate (N = 80)

Support Type	Factor 1	Factor 2	Factor 3	Factor 4	Communality
Information (Method 1)	.27	.07	.77[a]	.15	.70
Tangible Aid (Method 1)	.05	-.18	.72[a]	-.03	.56
Expressive (Method 1)	.33	-.29	.66[a]	-.03	.63
Closeness	.48	-.28	.33	.31	.52
Free Time Together	.09	-.10	.03	.91	.85
Informational Hindrance	-.14	.84[b]	-.05	-.11	.74
Aid Hindrance	-.04	.54[b]	-.26	-.25	.42
Emotional Hindrance	-.15	.83[b]	-.03	-.12	.73
Amount of Arguing	-.18	.67[b]	-.14	.22	.54
Information (Method 2)	.81[a]	.05	.27	-.06	.73
Tangible Aid (Method 2)	.75[a]	-.05	.21	-.12	.63
Expressive (Method 2)	.87[a]	-.16	.16	.02	.82
Satisfied with Support	.83	-.17	.26	.18	.81
Committed to Helping	.80	-.19	.09	.16	.71
Reciprocity	.67	-.32	-.14	.15	.59
Eigen value	5.70	1.91	1.33	1.04	--
Percent Variance	38.0	12.7	8.9	6.9	--

[a] Designates Factor 1 Assignment
[b] Designates Factor 2 Assignment

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