

SOCIAL LEARNING THEORY AND CONVALESCENCE OF THE  
MYOCARDIAL INFARCTION PATIENT

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We hereby recommend that the           dissertation           prepared under  
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"If God held all truth concealed in his right hand,  
and in his left hand the persistent striving for the truth,  
and while warning me against eternal error, should say:  
Choose! I should humbly bow before his left hand, and say:  
Father, give thy gift; the pure truth is for thee alone."

Lessing, Werke, Vol. X, 53

Dedicated  
to my loving husband  
Robert

whose love, support, and  
encouragement sustain me.



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## CHAPTER I

### INTRODUCTION

#### Statement of Problem

The psychological response to the occurrence of an acute myocardial infarction can be expected to vary from patient to patient. During the past several years, health professionals have identified and described the more commonly witnessed psychological responses to infarction and have, in some instances, documented relationships between these responses and recovery outcomes. Further knowledge is being developed regarding the effect of these psychological responses, or patient behaviors, on the outcome of recovery. This knowledge, however, could be supplemented by identification of the predictors of the patient behaviors known to affect recovery. This insight could enhance explanation and early prediction of those behaviors and could serve as a guide for the design and delivery of nursing care to the myocardial infarction patient.

The problem of this study was to test the applicability of social learning theory as a framework for the explanation and prediction of early convalescence behavior in the myocardial infarction patient.

### Definition of Terms

For the purposes of this study, the following definitions were utilized:

Locus of Control-- a continuous variable which may be dichotomized into internal and external locus of control;

External Locus of Control-- "When a reinforcement is perceived by the subject as following some action of his own but not being entirely contingent upon his action,...it is typically perceived as the result of luck, chance, fate, as under the control of powerful others, or as unpredictable because of the great complexity of the forces surrounding him" (Rotter, Chance, and Phares 1972, p. 261);

Internal Locus of Control-- "When the person perceives that the event is contingent upon his own behavior or his own relatively permanent characteristics" (Rotter, Chance, and Phares 1972, p. 261);

Perception of the Psychological Situation-- a patient's perception of whether his recovery from myocardial infarction is dependent upon skill or chance;

Myocardial Infarction-- the acute occurrence of myocardial necrosis as diagnosed by typical clinical history, electrocardiographic and serum enzyme changes;

Early Convalescence-- the period which extends from transfer from a coronary unit to the patient's discharge from the hospital;

Convalescence-- the period during which a patient is recovering from the effects of a myocardial infarction;

Recovery-- the process of returning to the highest level of wellness which is possible for the individual following a myocardial infarction;

Behavior-- the patient's psychological, cognitive and attitudinal responses to myocardial infarction.

### Objectives

The objectives of the study were to:

1. Determine the relationships between social learning theory variables (expectancy, reinforcement value, psychological situation) and measures of selected early convalescence behaviors.
2. Test the utility of social learning theory for the identification of patients at risk for poor recovery from myocardial infarction.
3. Determine differences in predictive value between a specific expectancy and a general expectancy measure of locus of control.

### Hypotheses

Based on the objectives, the following null hypotheses were formulated and tested:

1. There is no significant relationship between locus of control and selected psychological, cognitive, attitudinal, recovery, physiological, sociological, and demographic variables.
2. There is no significant relationship between health locus of control and selected psychological, cognitive, attitudinal, recovery, physiological, sociological, and demographic variables.

3. There is no significant relationship between health value and selected psychological, cognitive, attitudinal, recovery, physiological, sociological, and demographic variables.

4. There is no significant relationship between perception of psychological situation and selected psychological, cognitive, attitudinal, recovery, physiological, sociological, and demographic variables.

5. There is no significant relationship between situation-locus of control congruency/incongruency and selected psychological, cognitive, attitudinal, recovery, physiological, sociological, and demographic variables.

6. There is no significant relationship between locus of control, health locus of control, health value, and perception of psychological situation.

7. There is no significant predictive relationship between each of the following dependent variables and the social learning theory variables as independent variables, when multilinear regression models are built: anxiety, depression, denial, health knowledge, information-seeking, perceived health status, incidence of arrhythmia, incidence of pain, days in coronary care, and total days in hospital.



### Significance of The Study

A recent trend in the profession during the past decade has been the development of the specialty practice of cardiovascular nursing (American Nurse's Association 1975), which was prompted by the increasing prevalence of cardiovascular disease in this society. Cardiovascular disease is this nation's most potent killer, resulting in a yearly mortality rate greater than all other causes of death combined (American Heart Association 1976). Despite the significant overall mortality, annually 500,000 people survive myocardial infarction, the most virulent form of cardiovascular disease (Stern, Pascale, and McLoone 1976, Niccoli and Brammell 1976). It is to this group of potential recipients of nursing care that the proposed study is addressed.

An individual who has a myocardial infarction experiences a physiological and psychological insult (Pranulis 1975, Klein 1975, Gullede 1975). Considerable effort has been directed toward investigation of the physiological dimension of the insult, while the psychological dimension remains less well understood. An individual's psychological response to infarction, however, has been increasingly recognized as a significant determinant of his recovery (Cassem and Hackett 1973; Cay et al 1973; Garrity 1973a, 1973b; Garrity and Klein 1975). For example, researchers have found that initial severe psychological distress in

response to infarction is associated with poor recovery outcomes, such as greater six month mortality (Garritty and Klein 1975). Moderate levels of psychological distress following infarction have also been associated with poor recovery (Cay et al 1972, Cassem and Hackett 1973). Additionally, a patient's psychological perception of his health status following infarction, regardless of physiological status, appears to be predictive of level of recovery (Garritty 1973a).

Even though a relationship between psychological state and recovery has been tentatively defined, current knowledge provides a limited basis for the identification of valid predictors of specific psychological states. Without this kind of predictive knowledge, it is difficult to identify those patients who will exhibit the psychological behaviors which place them at various levels of risk for poor recovery (Garritty 1973). For example, even though prolonged psychological distress following infarction is known to be detrimental to successful recovery, the patients who could be expected to exhibit this response cannot currently be identified in time to circumvent or modify the response. If these patients could be identified early during hospitalization on the basis of behavioral predictors, level of risk for poor recovery could be assigned. This differentiation of level of risk for recovery could then serve as a guide

for rehabilitation interventions directed toward reduction of risk.

Nurses have a special interest in the rehabilitation of the myocardial infarction patient (American Nurses Association 1975). Although rehabilitation efforts begin with the patient's admission to the coronary care unit, it is usually after transfer from the specialty unit that more formalized rehabilitation efforts are instituted (Guzzetta 1977). It is during this early convalescence phase that the nurse assumes a major responsibility for the patient's preparation for hospital discharge, and his resumption of the self-care role (Niccoli and Brammell 1976; Guzzetta 1977; Winslow 1976). In fact, the major organization and delivery of services designed to facilitate successful recovery are implemented during this phase of recovery. If these services do not achieve desired outcomes (e.g., an informed patient who understands his illness and treatment, and who exhibits some degree of psychological equilibrium), the patient may never recover fully. The importance of this phase to long-term adjustment (Garritty and Klein 1973) requires that nurses have a sound understanding of the patient behaviors and responses which commonly occur. Increased knowledge of the convalescence period could be expected to result in more effective interventions and improved patient recovery. With this realization, a major

goal for the nurse becomes a search for knowledge which will facilitate the design and implementation of rehabilitation interventions.

If research evidence can be found to indicate specific determinants or predictors of psychological responses known to affect recovery, early identification of those patients who are expected to manifest particular responses could be accomplished. This knowledge could then guide the design and delivery of professional nursing care to the convalescing myocardial infarction patient.

## CHAPTER II

### RESUME OF PRESENT KNOWLEDGE

#### Introduction

The literature was reviewed to determine the psychological behaviors which might be of significance to recovery of the myocardial infarction patient. Following exploration in the initial section of this chapter of the state of knowledge regarding these behaviors, subsequent sections will explore the theoretical framework used in this study. The resume of present knowledge is specifically divided into the following areas: 1) psychological responses of the myocardial infarction patient during convalescence, 2) overview of social learning theory, 3) research with major social learning theory variables, and 4) locus of control in relation to information-seeking and utilization; rehabilitation; anxiety, stress, and response to threat; and situation-specific expectancy.

#### Psychological Response of the Myocardial Infarction Patient During Convalescence

One of the earliest studies to determine the psychological response to infarction during early convalescence was done by Rosen and Bibring (1966). The study hypotheses were derived from a theory of aging so data collection and

analysis were conducted within that framework. The investigators reported that the fifty male myocardial infarction patients who participated in the study showed "...striking differences in their overt psychological responses to their illness" (p. 808). Patient age and social class factors appeared to mediate depression and anxiety levels. Patients over fifty years of age were more depressed than those under fifty, and white-collar workers were found to be more anxious after a first myocardial infarction than were blue-collar workers.

Stern, Pascale, and McLoone (1976) reported their research findings in which psychosocial status was evaluated at five different points during convalescence in a group of sixty-three myocardial infarction patients. Findings revealed that during the hospital stay, 29% of the patients were depressed, 42% had clinically significant anxiety, and 25% exhibited denial, which was defined as a denial of being tense or apprehensive. Of those patients who were classified as depressed or anxious, 28% and 19%, respectively, were considered to have moderate to severe depression and/or anxiety. An attempt to relate the psychological variables to sociodemographic variables resulted in a significant correlation between depression and social class. Depression was found to be significantly associated with those unskilled or semi-skilled workers who had a high school

education or less. Study findings were somewhat conflicting in that ". . . history of previous myocardial infarction and age of patient at time of onset--factors previously cited in the literature as correlated with the extent of patient anxiety or depression--were not of significance in this study" (Stern, Pascale, and McLoone 1976, p. 522). It is of some interest that no new cases of depression or anxiety were discovered after hospital discharge.

Stern, Pascale, and McLoone (1976) also reported that one year following infarction, 13% of the patients were identified as poor responders. These patients had exhibited depression and anxiety throughout the entire period of follow-up and these psychological states were found to be associated with low rates of return to work and sexual functioning.

Another study which focused on psychological response to myocardial infarction was reported by Froese et al (1974) in which they described thirty-six infarction patients' anxiety and depression patterns throughout hospitalization. The investigators also related these behaviors to the occurrence of denial which was defined as " . . . the conscious or unconscious repudiation of part or all of the total available meaning of an event to allay fear, anxiety, or other unpleasant affects" (Forese et al 1974, p. 94). They found that anxiety and depression trajectories did vary, based on

whether a patient was a denier or non-denier. Although deniers were consistently rated as less anxious than were non-deniers, the only statistically significant difference occurred at hospital days three and four. Anxiety scores, which were measured at six points during hospitalization, declined more rapidly for deniers than non-deniers. Deniers also tended to be rated as less depressed than non-deniers. Denial was not found to be significantly related to either the patient's age or sex, and once manifested, it appeared to be consistent throughout hospitalization.

In a discussion of commonly witnessed patient responses to myocardial infarction, Cassem and Hackett (1973) identified depression as a ". . . most formidable psychological problem in cardiac convalescence and recovery" (p. 383). Indeed, Greene, Goldstein, and Moss (1972) found depression to be one of the most significant factors in the occurrence of cardiovascular sudden death in the twenty-six patients they studied.

Two major longitudinal studies were reported in which psychosocial adjustment to myocardial infarction continued as the research focus (Bruhn 1966, Cay et al 1972). The Neurocardiology Research Project, a seven-year study with a two-year follow-up of coronary patients and their matched controls, was conducted at the University of Oklahoma Medical Center from 1961 to 1970 (Bruhn 1966). The study



was designed to investigate the clinical, psychological, sociological, physiological, and dietary aspects of coronary heart disease. Data collection was planned for each dimension the study by the interdisciplinary research team. Only the major psychosocial study findings are reviewed here.

Non-survivors of infarction were found to be significantly more depressed than survivors, as evaluated by the Minnesota Multiphasic Personality Inventory (MMPI) (Bruhn, Chandler, and Wolf 1969). In addition, surviving myocardial infarction patients scored significantly higher than controls on the Depression and Anxiety subscales of the MMPI when tested bi-monthly over the last 18 months of the project (Bruhn, Chandler, and Wolf 1969).

Continued analysis of MMPI test results revealed no significant differences between patients less than fifty years of age and those older than fifty. Also, blue-collar and white-collar patients did not differ appreciably, with the exception of significantly lower anxiety scores for white-collar patients. Participation by some patients in short-term group psychotherapy did not result in any statistical differences in MMPI scores when compared to the scores of those who did not participate.

Another phase of the Neurocardiology Research Project was the investigation of social characteristics to determine

during hospitalization from 203 patients, who comprised four groups: first infarction; subsequent infarction; no infarction this time - no previous infarction; no infarction this time - previous infarction. Considerable emotional upset, manifested as anxiety and/or depression, was evident across all groups. Sixty-one percent of the patients who experienced their first infarction manifested psychological disturbance, as did 63% of those patients with a subsequent infarction. More patients with first infarction had difficulty with anxiety than did patients with subsequent infarction--55% versus 42%. Depression affected 37% of first infarction patients compared to 58% of the group with subsequent infarction. Cay went on to report that as many as 30% of those with first infarction and 42% of those with subsequent infarction had suffered ". . . quite severe emotional upset" (Cay et al 1972, p. 428).

In attempting to better understand the basis for the varying degrees of psychological disequilibrium in infarction patients, Cay related emotional upset to the severity of illness and the social situation. She found no relationship to severity of illness, but did confirm that emotional upset was related to the social problems perceived by the patient. These social problems included concerns about work, finance, and family.

A second phase of the Cay study was initiated after patients were discharged from the hospital. Data concerning work status, psychological status, and medical status were collected at both four months and one year after discharge to determine those factors relevant to return to work after infarction (Cay et al 1973). A majority of patients were working at four months (52%), although only one-third reported they were working as hard as before their illness. Angina and breathlessness were reported by many patients, and often the presence of physical symptoms determined whether an individual decided to return to work. Emotionally, the group was more stable at four months than during hospitalization. The most common symptom at four months was depression, however, rather than anxiety as found earlier. Cay also found that return to work after infarction was highly inversely related to emotional upset. In addition, disturbed patients tended to regard themselves as more physically handicapped than those without emotional disturbance--regardless of actual medical status. Data collected at one year post-discharge were very similar to the four month data, indicating that stabilization after infarction occurred earlier than generally believed.

A major study conclusion advanced by Cay was that ". . . the physical consequences of a heart attack do not by themselves determine success or failure of rehabilitation"

(Cay et al 1973, p. 241). The patient's emotional status and his perception of disability were consistently found to be significant factors in the adjustment process. Cay was able to demonstrate how measures of preliminary adjustment during hospitalization were related, in some instances, to long-term adjustment.

Support for the findings of Cay et al (1973) regarding the significance of perception of disability to recovery outcome was provided by Garrity (1973a, 1973b). He investigated the psychosocial adjustment of myocardial infarction patients in relation to morale and vocational status at six months post-infarction. Data were collected both during hospitalization and at six months post-discharge. It had been predicted in the first study that ". . . heart patients who achieved a high level of activity and social involvement after their attacks would be most likely to experience good morale" (Garrity 1973a, p. 204). This was proved incorrect, as the patient's perception of his health was found to be the most significant predictor of post-attack morale. In the second study, the only variable assessed at six months which correlated significantly with the infarction patient's return to work was his perception of health status (Garrity 1973b). These two studies, documenting the importance of the patient's perception of his health status, signal the need for further research regarding the possible antecedents

and determinants of health perception. In addition, Garrity (1973a) strongly urged investigation of other possible determinants of post-attack psychological status, in light of the paucity of existing empirical data in this area (Rosen and Bibring 1966; Cay et al 1972, 1973).

A major experimental, prospective study by Cromwell et al (1977) was conducted to determine how certain personality, nursing care, stress response, and biological factors affected the recovery of acute myocardial infarction patients. The study consisted of four major parts:

In the first part, called the nursing care study, the interactions of nursing care procedures and personalities of the patients were studied with regard to recovery, comfort, and cooperation during coronary care. In the second part, called the stress experiment, MI and non-MI patients were compared in their steroid, NEFA, and psychophysiological reactions to mild stress. The third part concerned the prediction of recurrence of coronary illness, death, and other relevant factors. The fourth part focused upon ways in which MI and non-MI patients differed from each other (Cromwell et al 1977, p. 93).

Study subjects consisted of 229 patients, of which 131 were myocardial infarction patients and 98 were non-infarction patients. Only those study findings concerned with prediction of recovery outcomes are presented.

Infarction patients were followed after hospital discharge, and death rates from a second myocardial infarction within twelve weeks were determined. A study variable, low social affection, was significantly correlated with death within twelve weeks. This variable was determined by the

Nowlis Mood Adjective Checklist and it was measured during a patient's stay in the coronary care unit. The investigators could not determine whether the underlying physiological status resulted in the unfavorable mood resulting in death, or whether the variable itself was a mediating factor in early death. A nonesterified fatty acid elevation in response to a psychologically stressful period was also found to be related to death within twelve weeks.

Cromwell et al (1977) also reported that psychological factors were more powerful than "blood, electrocardiographic, and measures of clinical symptoms" in predicting those myocardial infarction patients who would reinfarct within twelve weeks of hospital discharge. Extensiveness of scanning (the rate at which an individual processes information) was found to be the most significant predictor of recurrent infarction in study patients. Two additional psychological states, high anxiety and high depression, were also predictive of rehospitalization.

One additional finding from Cromwell et al (1977) was that locus of control was associated with cooperation during recovery. Patients with an internal locus of control were found to have greater attitudes of cooperation than those with an external locus. It can be seen from the Cromwell study that psychological factors can mediate recovery.

In a study which was not limited exclusively to myocardial infarction patients, Gray, Reinhardt and Ward (1969) evaluated psychosocial factors which might differentially affect rehabilitation of persons with cardiovascular disease. Major findings indicated that cardiovascular patients utilized more denial than other disabled patients and that they adopted the sick role less frequently. These patients were less likely to respond to an invitation to participate in a rehabilitation program, but once enrolled in a program, they were rehabilitated as successfully as were other disabled patients. Once again, the impact of psychological factors on the rehabilitation process was determined to be significant.

Substantiating the findings of Gray, Reinhardt, and Ward (1969) were those of Rahe et al (1973), who assessed the potential of group therapy as an adjunct to out-patient management of infarction patients. The investigators repeatedly documented the infarction patient's tendency to deny and repress the seriousness of his illness.

Denial was a focus of yet another study of myocardial infarction patients' adjustment during convalescence (Croog, Shapiro, and Levine 1971). This study of 345 male patients was conducted to explore denial behavior--the presence of denial, its change over time, and its effect on other behaviors. Denial was determined by asking a patient if he

thought he had had a heart attack. Patients were interviewed before hospital discharge, at one month, and at one year after discharge to determine information about symptoms and responses; to evaluate compliance with medical advice; and to describe the work situation, family relationships, and social behavior. Findings indicated that denial tended to persist for the 20% who were initially classified as "deniers". Deniers were also found to be poorer compliers with medical advice than were non-deniers. Finally, denial behavior generalized beyond simply denying the diagnosis of infarction. It also included behaviors such as minimizing symptoms and their effect on life and work, and claiming only positive personality traits. Denial was not found to be related to social variables or to selected personality traits. One significant correlation, however, between denial and ethnic origin was identified. The investigators did not identify other possible determinents of denial.

Further evidence of psychological problems of coronary convalescence was provided by Bilodeau and Hackett (1971). They conducted twelve weekly group sessions with five male cardiac patients, recently discharged from the hospital, and concluded that the patients experienced many emotional difficulties during their convalescence. They emphasized that adjustment to an infarction is an ongoing process that



continued long after hospitalization ends, and that a fuller understanding of this process must be acquired in order to help cardiac patients adjust.

Wishnie, Hackett and Cassem (1971) made home visits to a sample of twenty-four infarction patients who had previously been studied in the coronary care unit. The patients were visited between three and nine months after hospital discharge, and their most common complaint was physical weakness, which they each experienced during the first few weeks at home. Eighty-eight percent of the sample rated themselves as anxious, depressed, or both during the first month at home. Sleep disturbances were experienced by 55% and 38% failed to return to work for psychological reasons. Of those who were advised to stop smoking and lose weight, only a small percentage had been able to comply. One-third of the sample "meticulously" adhered to physician's instructions, and this same subgroup demonstrated overt anxiety and depression. Of the remaining patients, 58% tended to comply with instructions totally. Despite methodological weaknesses in the research, findings did reveal the effect of emotional and behavioral problems on recovery of the convalescing myocardial infarction patient.

Behavior was assessed in eighty-nine myocardial infarction patients who had participated in a comprehensive in-hospital rehabilitation program (Johnston, Cantwell, and

Gentry and Haney (1975) conducted a study to "...examine both inter- and intra-dimensional relationships between patient variables, prehospital behavior, CCU behavior, and outcome in patients hospitalized for acute MI" (p. 739). Data were collected from infarction patients within twenty-four hours of admission, and again at eighteen months after discharge. The data collected at eighteen months included cardiovascular morbidity, mortality, and functional status. The only significant finding involving the three outcome variables was that a lesser functional status was found for those patients (a) who reported less concern for dying while in the coronary care unit, and (b) who were more concerned about hospital finances than self.

Marston (1969) studied patients' compliance to medical regimens as a function of two personality variables, willingness to take risks and belief in personal control (i.e., locus of control). One major study hypothesis was that those patients with a belief in internal control would demonstrate higher compliance than those with an external control. In addition to other research instruments, Rotter's Internal-External Locus of Control Scale was administered to patients shortly before hospital discharge. Four months after hospital discharge, a patient's degree of compliance to his medical regimen was determined. Marston found no significant relationship between locus of control, willingness to take risk, and degree of compliance. Therefore,

the study hypothesis was not supported.

In addition to psychological response, another important factor believed to affect a patient's recovery from myocardial infarction is his understanding of the illness and its treatment (Winslow 1976, Niccoli and Brammel 1976). Preliminary investigation of the relationship between patient knowledge and long-term adjustment indicates that informed patients exhibit higher levels of adjustment (Johnston, Cantwell, and Fletcher 1976; Kercher, Taylor, and Ackerman 1976). This tends to support the fact that degree of patient knowledge has an effect on recovery from infarction. Very few studies were found, however, that identified the patient characteristics which can significantly affect patient learning (Guzzetta 1977).

#### Summary of major findings

From the review of research regarding psychological response during convalescence of the myocardial infarction patient, several behaviors which affect recovery outcomes have been identified. The state of the explanatory and predictive knowledge regarding these behaviors has been explored.

Anxiety and depression are two of the most commonly witnessed patient behaviors following myocardial infarction. Research evidence has shown each behavior to be consistently associated with undesirable recovery outcomes. Currently,

early identification or prediction of those patients who will manifest significant anxiety and depression is difficult. Although age, social class, and social problems have been identified as predictors of emotional upset in some studies, these findings have not been consistent.

Denial behavior is also found following infarction. Approximately 20% to 25% of patients may utilize denial, by either not admitting to having suffered an infarction, or by refusing to face the meaning of the illness situation. While denial has been found to reduce anxiety and depression levels post-infarction, it has also been associated with a decreased functional status during recovery. No consistent predictors of denial have been identified.

The patient's perception of his health status after infarction has been identified in several studies as a significant factor in recovery outcomes. There is limited understanding, however, of the factors which may affect the way in which the myocardial infarction patient views his health.

Finally, it has been shown that informed patients require fewer rehospitalizations, exhibit less psychological upset, and modify more high risk behaviors than uninformed patients. With the exception of anxiety, characteristics which may affect patient learning have not been identified.

In conclusion, although several behaviors have been identified which may have an adverse effect on recovery from myocardial infarction, current knowledge does not facilitate the early identification of the patients who can be expected to manifest these behaviors.

### Overview of Social Learning Theory

Few of the studies which were reviewed explored the myocardial infarction patient's behavior during convalescence from a theoretical perspective. This approach has tended to result in scattered empirical findings which have not yet been systematically integrated and may not, in fact, be capable of integration. This style of knowledge development is of limited heuristic value for the development of nursing interventions.

It would appear to be undesirable for nursing interventions to be developed apart from an explicit theoretical view of man and his behavior, for it is primarily through the utilization of theory that explanation, prediction, and control of behavior can be achieved. Social learning theory was selected as the framework for this study based on its demonstrated relevance to the study of behaviors which are found to occur during the myocardial infarction patient's convalescence. An empirical determination of the theory's applicability to the stated area of concern was the problem of this study.

Social learning theory is generally attributed to Julian Rotter who first presented and described the theory in 1954 (Rotter 1954). The theory was developed to explain complex human social behavior and it attempts this through utilization of an expectancy construct and an empirical law of effect (Rotter 1954, p. 1). Social learning theory may be regarded as a synthesis of two major divergent theoretical orientations in psychology--reinforcement theory and field theory. It attempts to draw from the strengths of each of these two theoretical views of behavior to produce a more powerful theory. Myriad research studies conducted over the past twenty-five years have resulted in extensive empirical confirmation of basic postulates derived from social learning theory, and have served to refine and extend the theory.

There are several major assumptions foundational to social learning theory which are concerned primarily with man and with the nature of his behavior. One of the most basic of these regards the interaction of man and his environment as the unit of investigation for the study of personality (Rotter, Chance, and Phares 1972, p. 4). It is proposed that meaningful study of personality cannot be achieved without consideration of the environment within which behavior occurs. Indeed, prediction and understanding of behavior remain severely limited without regard for situational determinants and influences.

This assumption has special implications for research with patients. A patient often finds himself in situations for which he has had little or no preparation. The influence and meaning of the environment to a patient may exert a profound effect on his behavior. All too often, however, patient behaviors have been explored without concern for possible environmental influences. Social learning theory, however, neither endorses nor utilizes this limited view of behavior. The assertion that the environment is an essential component of behavioral analysis and prediction has long been espoused within nursing (Rogers 1970, Orem 1971) and, in this respect, social learning beliefs and nursing beliefs are congruent.

Two additional assumptions were specified to discount the concepts of reductionism and dualism. Reductionism is discredited by the proposition that personality constructs are not dependent upon constructs in any other discipline for explanation (Rotter, Chance, and Phares 1972, p. 5). This means it is not acceptable to attempt the reduction of one level of description to another. For example, the reduction of psychological descriptions of behavior to physiological descriptions of that same behavior does not result in greater "truth." Rather, one descriptive level may be more useful for a designated purpose. Rotter, Chance, and Phares (1972) contend, ". . . the level of description employed is a function of the questions that need to be

answered," and that one descriptive level is not inherently better than another (p. 5). Efforts of the scientific community directed toward increasing precision of quantification may prompt reductionist tendencies in those who are unaware of the basic fallacy. However, social learning theory continues to avoid this practice.

"In our culture, a strong bias exists toward psychophysical dualism, the view that mind and body are separate yet interacting entities" (Leventhal and Israel 1975, p. 131). A third major assumption of social learning theory related to dualism is that behavior takes place in space and time (Rotter, Chance, and Phares 1972). It is accepted that a given behavior may be described from a variety of perspectives (e.g., psychological, physiological, sociological). Social learning theory posits the view that these different descriptions are of the same behavior and that one description cannot be more "real" than another. Thus, the concept of dualism is rejected.

A theory which embodies the negation of reductionism and dualism as concepts guiding knowledge development seems most appropriate to nursing. Indeed, the repudiation of dualistic and reductionistic thinking is prerequisite to nursing's advocacy of the belief in the wholeness and unity of man (Rogers 1970, Byrne and Thompson 1972, Orem 1971, Paterson and Zderad 1976).



Another major postulate of social learning theory is that personality has unity. Rotter defines this unity in terms of stability and interdependence. He believes that as

. . . the individual becomes more experienced, personality becomes increasingly more stable. [The individual] tends to select new experiences and interpretations of reality on the basis of previous experiences and conceptualizations (Rotter, Chance, and Phares 1972, p. 7).

In other words, the interpretations of new experiences will be influenced by past experiences. This is not meant, however, to obviate change or unprecedented behavioral responses. It does seem to indicate, though, that behavior and personality do become more predictable over time. This assumption emphasizes the need to understand past experiences as a necessary prerequisite to understanding present and future behavior. When viewed in relation to a patient, it becomes necessary to explore past experiences regarding health situations and practices, as these may influence current and future health behavior. Unfortunately, this has not often been done in health-related research.

The assumption that behavior is goal-directed is an important one in social learning theory. "It is the directional nature of behavior, accounting for selective responses to cues and for choice behavior, which is the motivational focus of SLT" (Rotter, Chance, and Phares 1972,

p. 8). It is because of this directionality of behavior that generalizations and behavioral predictions can be determined, if one first assesses the reinforcing properties of a particular event or stimulus complex. In health-related research it would be important to determine the positive and negative reinforcements which are identified by the patient. This would facilitate the prediction of behaviors which are directed toward and away from specific reinforcements in a health situation.

Before moving on from this postulate of goal-directed behavior, it is desirable to define the terms "goals" and "needs" as an understanding of these terms will be assumed in later discussion.

. . . when we focus on the environmental conditions that determine the direction of behavior, we speak of goals or reinforcements. On the other hand, when we focus upon the person determining the direction, then we speak of needs. Both needs and goals are inferred from the same referents--the interaction of the person with his meaningful environment (Rotter, Chance, and Phares 1972, p. 10).

It is apparent that goals and needs are defined essentially in the same way. The only distinction is whether they exist internal or external to an individual.

The last postulate to be presented introduces the concept of expectancy by stating that

the occurrence of a behavior of a person is determined not only by the nature or importance of goals or reinforcement but also by the person's anticipation or expectancy that these goals will occur. Such

expectations are determined by previous experience and can be quantified (Rotter, Chance, and Phares 1972, p. 11).

It is the consideration of expectancies which is central to social learning theory as they are believed to be the prime determinants of behavior. Phares (1976) describes the significance of expectancies in the following way:

. . . behavior is determined by the degree to which people expect that their behavior will lead to goals, as well as by reinforcement through goal achievement. The magnitude of a given expectancy will depend upon the people's previous experiences with certain behaviors and their outcomes. Successful past experience with a given behavior will lead one to expect that it will work in the future. Failure will decrease the individual's expectancy that the behavior will achieve a given goal. Expectancies for the outcomes of behaviors are learned, and they depend upon the degree of success or failure they have enjoyed in the past. Changes in expectancies can be brought about by introducing new experiences that alter previous patterns of success and failure (p. 13).

It seems apparent from the above discussion that an expectancy construct could be of value in the prediction of behavior. Indeed, social learning theory takes advantage of this supposition as will be seen in subsequent discussion.

In addition to social learning theory's major assumptions, there are four fundamental concepts which are utilized in the prediction of behavior. These concepts are (1) behavior potential, (2) expectancy, (3) reinforcement value, and (4) the psychological situation (Rotter, Chance, and Phares 1972, p. 11). The following concept definitions have been given by Rotter:

Behavior potential may be defined as the potentiality of any behavior's occurring in any given situation or situations as calculated in relation to any single reinforcement or set of reinforcements (Rotter, Chance, and Phares 1972, p. 12).

Expectancy may be defined as the probability held by the individual that a particular reinforcement will occur as a function of a specific behavior on his part in a specific situation or situations. Expectancy is systematically independent of the value or importance of the reinforcement (Rotter, Chance, and Phares 1972, p. 12).

The reinforcement value of any one of a group of potential external reinforcements may be ideally defined as the degree of the person's preference for that reinforcement to occur if the possibilities of occurrence of all alternatives were equal (Rotter, Chance, and Phares 1972, p. 13).

Rotter does not explicitly define the psychological situation; however, it is discussed in terms of external and internal environmental stimuli to which an individual selectively reacts (1972, p. 13).

The four concepts are related to one another in the following formula which allows one to conceptualize their predictive potential:

$$BP_{X, S_1, R_a} = f (E_{X, R_a, S_1} \text{ \& } RV_{a, S_1})$$

[The] formula says, The potential for behavior X to occur, in situation 1 in relation to reinforcement a, is a function of the expectancy of the occurrence of reinforcement a, following behavior X in situation 1, and the value of reinforcement a in situation 1 (Rotter, Chance, and Phares 1972, p. 14).

The relationship between the expectancy and reinforcement value of any given behavior in a specific situation can

readily be seen to determine the final behavior which an individual evinces. For example, a behavior has a higher probability of occurring if the individual has a high expectancy for the attainment of a highly valued reinforcement which is believed related to the behavior. If an individual held a high expectancy for a behavior to result in a very lowly valued reinforcement, he probably would not be motivated to exhibit that behavior. Another example would be the individual who held a very low expectancy for achieving a highly valued reinforcement which could result in a state of anxiety and/or depression.

The importance of these essential concepts can be visualized within a health context. For example, a patient who values health (reinforcement) highly and who also holds a low expectation of return to health (expectancy) in a specific illness situation (psychological situation) may be very depressed. Another patient who has a high expectation (expectancy) that his activity will result in pain (reinforcement) may be quite anxious and may reduce his activity depending on the nature of the situation (psychological situation). Although these examples represent simplifications of the concepts, the predictive accuracy for health behavior which could be attained by the simultaneous consideration of expectancy, reinforcement value, and psychological situation can be appreciated.

It is evident that the preceding discussion of fundamental concepts was very specific (i.e., reinforcement a, situation 1, behavior X). Rotter has developed a broader conception of each concept, however, which can be used for molar predictions (Rotter, Chance, and Phares 1972, p. 14). Only one of these will be discussed here--generalized expectancies.

"It is hypothesized in social learning theory that when an organism perceives two situations as similar, then his expectancies for a particular kind of reinforcement, or a class of reinforcements, will generalize from one situation to another" (Rotter 1975, p. 57). Therefore, an expectancy for any specific situation is dependent upon prior experience in that situation, as well as past experience in similar situations. The contribution of the generalized expectancy to the specific expectancy for the situation will depend upon many factors including the novelty of the situation. An important point to be emphasized here is that generalized expectancies do affect behavior.

A special type of generalized expectancy is represented by the label "internal or external control of reinforcement." Those individuals who manifest an internal control of reinforcement believe that what happens to them in life is dependent upon their own behavior and/or control, while externals believe that luck, fate, or powerful others

control the reinforcements they receive (Rotter 1966). Knowledge of how an individual generally views the control of reinforcement in his life, his locus of control, can be helpful in predicting his behavior. Unfortunately, many investigators interested in prediction of behavior have limited themselves to a consideration of only the locus of control variable. Once again it must be emphasized that social learning theory mandates not only the consideration of expectancies in understanding and predicting behavior, but also reinforcement value and the psychological situation.

In summary, a major theory of personality is found in social learning theory. Several important postulates serve as a foundation for the identification of four essential concepts--behavior potential, expectancy, reinforcement value, and psychological situation. The interrelationship of these concepts serves as a conceptual guide to the analysis of human behavior and can allow for the prediction and ultimate control of that behavior.

#### Research with Major Social Learning Theory Variables

Social learning theory has provided a framework for the development of knowledge about man and his behavior. Approximately 1,000 studies conducted since 1954 have derived their hypotheses from social learning theory.

Several studies which have direct relevance to health behavior are reviewed in this section.

Rotter (Rotter, Chance, and Phares 1972) specifically stated that behavior cannot be accurately predicted without knowledge of an individual's expectancy for achieving a reinforcement, the value which he places on the reinforcement, and the nature of the psychological situation. However, the vast majority of research conducted to date does not examine all these variables when attempting to study and predict behavior. In fact, the locus of control construct, a generalized expectancy construct, was the sole focus of most of the research studies which were reviewed.

No study was discovered which had directly measured all three concepts relevant to social learning theory--expectancy, reinforcement value, and the psychological situation. A few studies, however, had directly or indirectly included at least two of the major variables in their research design.

One of the few studies to examine more than the locus of control construct was conducted by Wallston, Maides, and Wallston (1976). The purpose of the study was to "show how social learning theory (could) provide a theoretical perspective for studying individual differences in information-seeking regarding preventive health care" (p. 215). Not only was a generalized measure of expectancy utilized, but



also a specific measure of health expectancy. In addition, the value of the reinforcement (health) was determined. Although the nature of the psychological situation did not appear to be directly examined, at least an attempt was made to hold it constant.

On the basis of their response to two scales, subjects in the Wallston, Maides, and Wallston (1976) study were classified as internals or externals regarding health locus of control, and as having a high or low health value. Statistical analysis revealed that the "internal-high health value group" scored significantly higher on the dependent variable, number of health information pamphlets selected, than any other group. Social learning theory predictions were substantiated by finding that individuals who believed they could affect their health (internal health locus of control), and who valued health highly, were the ones to select more sources of health information, which was the behavior the researchers wanted to predict. It is very likely that the significant findings would not have been obtained had value of health not been considered as a variable. This study emphasizes the predictive accuracy that can be achieved if more than one variable from social learning theory is utilized.

A final point of interest in the Wallston study was that a specific measure of expectancy, Health Locus of

Control Scale, was used in addition to Rotter's Internal-External Generalized Expectancy Scale (Rotter 1966). Had the investigators attempted to predict health behavior solely on the basis of a measure of generalized expectancy, they would not have obtained findings of statistical significance. It is because of this lesser degree of predictability with the generalized expectancy measure that Rotter (1975) has suggested the development of "a specific measure if one's interest is in a limited area and particularly if one seeking some practical application where every increment in prediction is important" (p. 59). It was due to the utilization of a specific measure of expectancy that significant differences in the reported study were found.

Similar findings to those reported in the preceding study were found in another study by Wallston et al (1976) which also utilized the Health Locus of Control Scale, Rotter's I-E Scale, and the Health Value Measure. Once again, the I-E Scale did not result in the degree of prediction that the Health Locus of Control Scale did. However, the significance of prediction was not as strong in this study as in the earlier Wallston, Maides, and Wallston (1976) study.

No other studies reported in the literature directly measured a specific expectancy and a specific reinforcement value as did the Wallston studies. In a few studies,

however, a second variable was accounted for by being held constant. Rotter (1975) made the following important observation regarding research directed by social learning theory:

Without doubt, the most frequent conceptual problem on the part of a number of investigators is the failure to treat reinforcement value as a separate variable. To make a locus of control prediction, one must either control reinforcement value or measure it, and systematically take it into account (p. 59).

Some studies which did not directly measure reinforcement value had good reason to assume that the reinforcement was consistently highly valued by subjects so that, in effect, value was held constant. For example, Seeman and Evans (1962) studied hospitalized tuberculosos patients and assumed the patients all wanted to return to health--that wellness was valued. They found that internal patients, as determined from Rotter's I-E Scale, were more knowledgeable about their disease and that staff considered them to be more highly informed than were external patients. This successful attainment and synthesis of knowledge is more commonly attributed to those with internal control, as later studies have confirmed (Davis and Phares 1967, Phares, 1968, MacDonald 1973, Seeman 1963).

Another example of a study which assumed a highly valued reinforcement for all subjects was conducted by Gore and Rotter (1963). The research subjects were students in a southern Negro college and it was found that Rotter's I-E Scale significantly predicted the type and degree of student

behavior directed toward social change. It is conceivable that if the black students had not been so highly committed to attaining civil rights, the significant prediction of an internal's involvement in social change action might not have been achieved.

There have been several studies which have failed to yield results consistent with social learning theory and its body of confirming research. Although it is entirely probable that some of these contrary findings are accurate, it is also likely that some theoretical hypotheses concerning the behavior of internals or externals were not supported because the reinforcement value variable and the psychological situation variable were not taken into account. If the locus of control variable is studied to the exclusion of other social learning variables, the veracity of findings must be questioned, as accurate predictions cannot be made on the basis of knowledge of locus of control alone. The majority of reported research conducted within a social learning framework, however, has focused primarily on locus of control, while the effects of reinforcement value and the psychological situation have neither been measured nor controlled. The few studies which did utilize more than one variable were identified and discussed.

In the remaining sections of this chapter, major research conducted in relation to locus of control is reviewed.

Studies were selected for inclusion on the basis of their potential relevance to understanding health behaviors in general, and behaviors demonstrated by the myocardial infarction patient in particular.

Locus of Control and Information-  
Seeking and Utilization

Many studies have confirmed the hypothesis that internals demonstrate more initiative, effort, and success in controlling their environments through the acquisition and utilization of relevant information than do externals. Two of the earliest studies to test the hypothesis just stated were by Seeman and Evans (1962) and Seeman (1963). Both studies confirmed the fact that internals had significantly more knowledge regarding their personal conditions than did externals. Internal tuberculosis patients knew more about their condition than did external patients (Seeman and Evans 1962), and internal prison inmates exhibited greater knowledge about attainment of parole than did externals (Seeman 1963). It is evident from both of these studies that internals attempted to gain a greater degree of control over their life situation through the acquisition of knowledge than did externals.

Additional studies which utilized patients as subjects confirmed Seeman's early findings reported above. In a study by Johnson et al (1971), internal-external control

was found to be associated with the ability to influence care. As a part of a larger study of surgical patients, locus of control was investigated in relation to patient's success in controlling their environment. As predicted, internal patients were significantly more successful in controlling their environment as evidenced by their obtaining more doses of analgesics and by influencing the length of their hospitalization.

Lowery (1974) examined disease related learning and disease control in diabetics. She found that diabetics classified as internals knew significantly more about their disease than did externals. The findings regarding disease control also yielded a significant interaction for locus of control and length of illness. From this study, it is apparent that locus of control was a mediating factor in diabetic learning and disease control.

In two previously cited studies (Wallston, Maides, and Wallston 1976; Wallston et al 1976) it was found that students classified as having an internal health locus of control selected significantly more health information pamphlets than did externals. Although the subjects were not patients, health behavior was the major focus of both studies.

Another group of studies, which were non-patient, non-health related, also were found to corroborate the

hypothesis that internals are superior to externals in information-seeking and utilization. A frequently cited study in the literature is one by Davis and Phares (1967). Working with college students, they studied the effect of locus of control on the behavior of students preparing to influence the attitudes of others concerning the war in Vietnam. Internal students were found to seek significantly more information about the people they were expected to influence than did externals. This result was interpreted as confirmation that internals will attempt to actively control their environment by procuring the necessary information to do so.

Phares (1968) conducted a study which attempted to demonstrate that internals were more effective than externals in the utilization of information. He reasoned that

Internals, having a higher generalized expectancy that reinforcements follow as a function of their own efforts, should better utilize information since they would likely see correct utilization as a pathway toward reinforcement (p. 651).

In a rather complex research design, internals and externals were compared in their abilities to use information learned to a similar criterion level for decision-making. Phares found that internals were much more likely to utilize information than externals who were equally aware of the information. He concluded that internals should have greater potential for effectiveness in their environments.

Internals again indicated a greater willingness to engage in information-seeking behavior than did externals during an experiment by Miller (1970). He randomly assigned subjects to either a low-threat or high-threat group created by artificial psychological evaluations. He found that regardless of the nature of the threat, the internal subjects were more willing to seek information about themselves.

Williams and Stack (1972) studied black students and the effect of locus of control on their information-seeking behavior. Although a differential amount of "question asking" was not found between the treatment conditions, the investigators did find that internal subjects in all groups asked significantly more questions to determine information necessary for an anticipated task than did external subjects. They concluded that amount of information-seeking was predictable on the basis of the locus of control construct.

Ducette and Wolk (1973) hypothesized that "internal subjects, in situations where information can be obtained that will lead to problem solution, demonstrate a greater ability to extract information from their environment and then use this information to solve a problem" (p. 421). They used a simple problem-solving task in which a non-verbal cue from the experimenter suggested a solution to



the problem. It was discovered that internals required significantly fewer trials to discover the rule for successful problem solution. In other words, internals were more successful in extracting information from the environment and determining its significance for task solution.

The outcome of another study by Wolk and DuCette (1974) was interpreted by them as having considerable theoretical significance. After studying intentional performance and incidental learning during an experimental task as it related to locus of control, they concluded that the internals were more perceptually sensitive and that they evinced a more attentive and organizing cognitive system than externals. This is their explanation for the differences between internals and externals regarding organization and utilization of information. In fact, Wolk and DuCette suggested generic differences in perceptual and cognitive processes between the two groups.

It would be unfair to review only those findings which were in support of an internal subject's superior ability to acquire and utilize information. Two studies were found which failed to confirm hypotheses regarding behaviors of internal and external subjects.

In 1972, Loren studied locus of control as it related to preference for information about an uncertain but unavoidable outcome. She predicted that internal subjects

" . . . would show a consistent preference for obtaining information about whether an unavoidable, random electric shock was to occur in a series of trials" (p. 2793-B), and that externals would not. She reasoned that this information would help internals prepare for outcomes and allow them some sense of personal control. Interestingly, although a definite pattern in individual differences in information-seeking was observed, the differences were not at all related to a subject's locus of control. Although not mentioned by the investigator, there was a strong possibility that the internal subjects' reaction to the psychological situation, which was a chance situation, may have contributed to the nonsignificant findings.

The second study was specifically designed to determine possible relationships between information-seeking behavior and locus of control (Gibson 1968). Subjects were randomly assigned to one of three success conditions in which they had to guess whether the sum of numbers in sixteen decks of cards was above or below zero after paying to see some of the cards. Gibson found no significant differences between internals and externals on any of the information-seeking types of dependent variables. In attempting to explain his results he decided the study had, indeed, been valid and that I-E "theory" had just not been substantiated. One wonders what findings might have been obtained

if he had considered the value of the reinforcement to the subjects, instead of ignoring this variable.

The research which has been reviewed overwhelmingly supports the hypothesis that internals demonstrate behavior which should allow them to better control their environments. It is important to emphasize that no studies reported differences in intelligence between internals and externals so it is not believed to account for their differential perceptual and cognitive abilities.

The fact that locus of control has been shown empirically to affect degree of knowledge acquisition and utilization makes it a variable of considerable interest to those who wish to explore health behavior. This is because health behavior is believed to be related to the amount of understanding one has in a particular situation. Also, self-care, which is an important health goal, is contingent upon one's ability to utilize knowledge to control a health situation. However, only very limited investigation into the general relation of locus of control to health behavior has been conducted.

Most of the studies presented in this section were conducted as experiments (Davis and Phares 1967; Phares 1968; Miller 1970; Williams and Stack 1972; DuCette and Wolk 1973; Wolk and DuCette 1974; Loren 1972; Gibson 1968; Wallston, Maides, and Wallston 1976; Wallston et al 1976),

with only three studies having been done in the field (Seeman and Evans 1962; Seeman 1963; Lowery 1974). More field work is necessary to determine the external validity of experimental findings. Also, more research which considers reinforcement value and the psychological situation, in addition to locus of control, is needed.

### Locus of Control and Rehabilitation

The fact that locus of control has to do with the perception or expectancy one has for influencing or not influencing his world has made it an attractive variable to those professionals concerned with rehabilitation. It would seem to be a variable relevant to the examination of an individual's adjustment to a disability. As previously discussed, internals have been shown to seek information which might allow them to better control their environment, to be more successful in problem-solving, and to alter undesirable behavior. / Because of the promise the locus of control variable seems to have for prediction of successful rehabilitation, a few investigators have begun to examine it within this context.

Max (1974) attempted to determine the relationship between locus of control and twelve variables considered important to rehabilitation efforts such as tendency to achieve, educational level, community involvement, sex and age. Using a sample of eighty-seven spinal cord injured

persons he concluded that Rotter's I-E scale was useful in assessing some rehabilitation goals. The abstract, in which this study was presented, did not report additional findings.

The patient's recovery from orthopedic surgery as it related to locus of control was studied by Philips (1974) He found there was

a significant association between the personality dimension of internal-external locus of control and anxiety during hospitalization and the number of minor physical complications experienced by the patient. . .there was a suggestive trend in the association of internal-external locus of control and the therapeutic interaction of the patient and the nursing staff. The length of hospitalization was not found to be associated with locus of control (p. 4632-B).

There is no evidence that Philips evaluated reinforcement value and/or the psychological situation.

A recent study by Swenson (1976) examined the relationship between locus of control and successful rehabilitation of spinal cord injured patients. He was attempting to determine if internal patients had less medical complications, more satisfaction with life, and greater productivity than external patients. He did find significant differences in the predicted direction between internals and externals on the above stated behaviors. He concluded that since locus of control had been significantly correlated with desirable rehabilitation behaviors, rehabilitation

counseling should support internality and should promote its development in external patients.

In a well-executed study of vocational adjustment after myocardial infarction, Garrity (1973b) studied numerous variables which could affect a person's return to work. One of these variables was locus of control which was measured by a shortened five-item version of Rotter's I-E Scale. He found, unexpectedly, that patients who were more external were more likely to be working after the infarction. Garrity was unable to explain why this unexpected finding was obtained. It was not possible to discern from the reported data whether there could have been differences in the severity of attack between internals and externals. If there had been differential severity, perhaps it would account for the finding that more externals were at work than internals.

Based on the assumption that successful rehabilitation would be more likely for individuals with an internal locus of control and a positive self-concept, Hagmeier (1973) investigated a method to help develop these attributes in the disabled. His sample, selected from clients at a department of vocational rehabilitation, was exposed to a Born to be Great program which was designed to identify and support individual strengths and encourage constructive attitudes and actions. He found that a disabled person could develop

a more internal locus of control through the training program.

A P. MacDonald of the West Virginia University Rehabilitation Research and Training Center has been involved in locus of control research in relation to disability for many years. One of his earlier studies in 1969 dealt with perception of disability and locus of control. Although aware of research findings which supported an internal's superior cognitive ability, MacDonald was also aware of a finding by Phares (1968) in which "internals were found to recall less negative information about themselves than did externals" (MacDonald 1969, p. 655). His curiosity about how this might affect perception of disability led to a study developed to determine if

internals perceive emotional disorders as more debilitating than externals and...[if] external's view disabilities other than emotional disorders as more debilitating than internals (p. 655).

A scale was developed for the measurement of the subject's (graduate students) perceptions of the seriousness of five disability types--internal and sensory disorders, disfigurements, amputations, and emotional disorders. As expected, internal subjects perceived emotional disorders as more debilitating than externals. This was interpreted to mean that internals, who have a greater sense of control than externals, would view loss of that control through an emotional disorder as more debilitating. No significant

relationship was found between locus of control, however, and the remaining disability types.

In a refinement of the study just reported, MacDonald and Hall (1971) again studied perception of disability. This time subjects were asked to react to types of disability by rating the degree of debilitation which they personally would experience, rather than how they thought a hypothetical person would react. This time the investigators found that externals rated sensory, internal and cosmetic disorders as significantly more debilitating than did internals. It is of interest to note that in this study internals and externals did not differ significantly in their ratings of emotional disorders. Although there was some discussion of why the findings were different in this study, MacDonald urged that no definite conclusions be drawn from the data.

In a summary review of literature later in 1971, MacDonald stated that

Research literature leads to the conclusion that a) externally controlled persons are more threatened by physical disabilities, (and) b) internals, relative to externals, view emotional disorders as more debilitating than physical disabilities,... (p. 111).

He warned that most studies to date had been conducted with well subjects and that different findings might obtain if disabled subjects were used. He encouraged field studies



with the disabled to better understand the effect of the locus of control variable.

Subjects from a rehabilitation unit participated in a study by Lipp, Kolstoe, and James (1968). The investigators proposed that locus of control might be related to acceptance or non-acceptance of disability. Results indicated that disabled people generally found disability unacceptable, and that they commonly utilized denial. Contrary to what had been predicted, externally controlled disabled individuals were less denying of their disability than the internally controlled. Several interpretations of the findings were given including the one that "perhaps physical disability is more threatening to an individual who customarily perceives that he has control of events (internal control)" (Lipp, Kolstoe, and James 1968, p. 74)

A final study which examined locus of control in relation to successful rehabilitation was conducted by Marston (1970). The primary focus of the study was the degree of compliance demonstrated by patients with myocardial infarction. Marston proposed that willingness to take risks and locus of control were two variables which would affect a patient's compliance to his medical regimen. Regarding locus of control, she specifically predicted that internal control would be associated with high degrees of compliance,

and external control with non-compliance. The findings did not support the hypothesis, however,|

Theoretically, the locus of control construct would seem to be an important rehabilitation variable. The empirical findings reviewed in this section tend to support that belief, however, they are far from conclusive. It will be recalled that several studies were presented which did not confirm theoretically based predictions. Much more extensive research is necessary to define the nature of the relationship between locus of control and rehabilitation.

#### Locus of Control and Anxiety, Stress, and Reaction to Threat

Considerable research has been done to determine the relationship between locus of control and anxiety. Early hypotheses predicted that internals would be generally less susceptible to anxiety than externals, because they were known to be more adjusted, more self-confident, and they believed in and demonstrated their ability to control their environment and fate. The findings from several current studies, however, do not totally support the simple direct relationship which was first conceptualized between anxiety and locus of control.

Several studies have reported a strong relationship between externality and a variety of different anxiety measures (Joe 1971, Watson 1967, Gold 1968, Donovan 1975, and

Lowery 1975). Phares (1976) cited the following anxiety measures which had low, but significant correlations with an external locus of control: Alpert-Haber Facilitating-Debilitating Test Anxiety Questionnaire, Mandler-Sarason Test Anxiety Questionnaire, Taylor Manifest Anxiety, Death Anxiety Scale, IPAT Anxiety Scale. Phares summarized by saying

...the relationship between externality and anxiety has been found in so many different anxiety measures, populations and test conditions, that the conclusion now appears inescapable (1976, p. 121).

Joe (1971) also reported on the significant relationship between anxiety and locus of control. Since most of the measures of anxiety which had been used in investigation of the relationship were self-report measures, Joe emphasized that

...Externals describe themselves as anxious, less able to show constructive responses in overcoming frustration, and more concerned with fear of failure than with achievement per se. Internals...describe themselves as more concerned with achievement, more constructive in overcoming frustration, and less anxious (p. 625).

It is of interest that the empirical support for a relationship between externality and anxiety is based primarily upon self-report measures.

A study of theoretical significance regarding anxiety was conducted by Houston (1972). In his research, he examined the relationship between locus of control and anxiety, but he evaluated anxiety by physiological arousal

(heart rate), in addition to a self-report measure (Zuckerman's Affect Adjective Check List). While internals and externals did not differ in their reports of anxiety in stressful situations, the internals did show significantly greater physiological response than did externals. This finding suggested that what internals deny verbally they fail to hide physiologically. Houston (1972) proposed the following explanation:

External-control subjects view forces outside themselves as being responsible for their fate and do not become very aroused when faced with threat because they resign themselves to the situation. Internal-control subjects become highly aroused when threatened, but they are reluctant to report anxiety; hence, a significant difference in heart rate change scores but no significant difference in AACL change scores was found between internal-control and external-control subjects across the threat conditions. The interpretation that internal control subjects are defensive about reporting anxiety is supported by...research findings which indicate that internal-control subjects are more defensive and report less chronic anxiety than external-control subjects (p. 254).

What seemed earlier to be a straight forward relationship between externality and anxiety must be questioned on the basis of these findings. If internals are, indeed, more defensive about the admission of anxiety than are externals, have their anxiety levels been accurately reflected in earlier research?

The possible proclivity of internals toward defensiveness and denial in stressful situations has received some attention. In a previously mentioned study (Lipp, Kolstoe,

and James 1968) denial of disability was explored. In a fairly simple experiment, externally controlled disabled subjects were found to be significantly less denying than were internals. No conclusive explanation for this finding was given.

Two additional studies investigated the relationship of denial and locus of control in subjects who were in chronic renal failure (Goldstein 1971, Tetlow 1974). Goldstein proposed that "patients with a serious medical condition would utilize more denial and would be more external in orientation than patients in the convalescent states of minor medical ailments" (p. 3001-B). He found that hemodialysis patients were significantly more external and more denying than the control group. A significant correlation between denial and externality also was found.

Goldstein concluded by saying

Patients who are seriously ill often assume a large responsibility in their treatment regimen. The present investigation demonstrated that such patients employ an external orientation in the perception of their lives. Such an orientation is counterproductive whenever patients are given responsibilities in their treatment such as rigid diets, modified activities, and participation in regularly scheduled treatment sessions (1971, p. 3001-B).

The results of this study, externality associated with increased denial, conflict with those of Lipp, Kolstoe, and James (1968) who reported externality associated with decreased denial. The explanation for this difference is not

readily apparent.

Investigating an hypothesis similar to that of Goldstein, Tetlow (1974) found no significant correlation between denial and externality in a group of hemodialysis patients--the opposite of Goldstein's finding. The conflicting results of the previous three studies emphasize the need for further research to clarify the relationship between locus of control and denial. This relationship is of particular interest to those concerned with myocardial infarction patients as it has never been investigated, even though infarction patients frequently tend to exhibit denial. Perhaps locus of control could facilitate understanding and prediction of denial in these patients.

A recent multivariate study which involved locus of control was conducted by Naditch, Gargan, and Michael (1975). They were specifically concerned with studying denial, anxiety, locus of control, and the discrepancy between aspirations and achievements as components of depression. After administration of a battery of personality scales which included Rotter's I-E Scale to 547 army recruits, they determined that depression, discontent, and anxiety were positively correlated with externality. Denial, however, was negatively correlated with externality. A comparison of these findings with previously reported research on denial and locus of control must include the fact that this

sample of Army recruits was "healthy" compared to patient samples used in the earlier studies.

Phares, Ritchie and Davis (1968) studied locus of control and reaction to threat in relation to the following three hypotheses:

...when confronted by threatening material which presents a challenge to one's views of himself, an external will react with less anxiety than will an internal.

...when both adverse and positive material is presented, the external will forget less of the adverse material than will the internal, while there will be no differences between the two groups as regards the retention of the positive material.

...when presented an opportunity to take overt remedial action as regards personal shortcomings, internals will show a greater tendency to do so than will externals (p. 403).

The first hypothesis was not supported--internals did not report greater anxiety in response to threat. Externals did recall a greater amount of material as predicted by the second hypothesis. However, the interaction between internal-external orientation and type of material (positive versus negative) did not obtain. As supposed, internals did indicate greater willingness to confront problems. Replication of this study with a larger sample and a more sensitive measure of anxiety would be helpful.

Locus of control and anxiety were examined in relation to success or failure on an experimental task (Siegel and Mayfield 1973). Students, serving as subjects, were

administered two sequences of trails on an angle-matching task for which there was no correct response. After both sequences, subjects were arbitrarily informed they had either succeeded or failed and an anxiety measure was then administered. Results indicated that externals who had failed were lower in anxiety than externals who had succeeded, internals who had failed, and internals who had succeeded. The results seem to demonstrate a rather complex relationship between locus of control and anxiety such that

. . . internals may actually become more anxious in threatening situations than externals because they lack the external's belief that forces outside themselves are responsible for their fate, and therefore, cannot resign themselves to the situation as the externals presumably do. . . . An external orientation may provide greater flexibility in dealing with anxiety from threat (Siegel and Mayfield 1973, p. 1190).

The suggestion that the direct relationship between externality and anxiety may be reversed in conditions of threat merits considerable investigation. Specifically, it would be helpful to know the relationship between locus of control and anxiety for the myocardial infarction patient who experiences a serious threat to life and life-style with the occurrence of an infarction.

It can be seen that the relationship between locus of control and anxiety, depression, denial, and reaction to threat has not been satisfactorily determined. Research has



yielded conflicting findings, with the same hypotheses being both accepted and rejected. It must be stated once again that the inclusion of additional social learning theory variables, such as reinforcement value and the psychological situation, may help to clarify the relationship between locus of control and other psychological variables in a way which the singular study of locus of control cannot.

#### Locus of Control and Situation-Specific Expectancy

An important variable in social learning theory is the psychological situation. The contribution of this variable to behavioral prediction is usually overlooked by researchers as they, instead, focus solely on locus of control. Several studies reviewed in this section demonstrate the dependence of behavior on the situation in which it occurs. The studies demonstrate that behavior is different "when subjects perceive that they control the contingency between behavior and reinforcement and when they perceive that they lack such control" (Phares 1976, p. 25). In other words, behavior is differentially affected when situations are perceived as either skill or chance.

One of the first studies to show that behavior under skill conditions differed from behavior under chance conditions was conducted by Rotter and Mulry (1965). They began the study primarily to examine reinforcement value, another significant variable in social learning theory. They

hypothesized that internals would differ from externals in the value they placed on the same reward based on whether its attainment was perceived as contingent upon skill or chance. It was found that

Individuals who can be characterized as internals from scores on the I-E Control Scale, take longer to decide in a matching task when the task is defined as skill controlled than when it is defined as chance controlled...Externals tend to take longer to decide on the correct match when the task is defined as chance controlled rather than when it is defined as skill controlled. The interaction is highly significant (Rotter & Mulry 1965, p. 603).

These findings reflected a difference in behavior that was not predictable from knowledge of locus of control alone; it was necessary to characterize the nature of the situation as well.

Watson and Bauml (1967) designed a study to test the performance of individuals in congruent and incongruent situations. Congruent situations were considered to be those in which internals were in skill conditions and externals were in chance conditions. Incongruent situations were those with internals in chance conditions and externals in skill conditions. The hypothesis was "that individuals in incongruent situations become anxious, and that this emotion interferes with their performance on complex tasks" (Watson & Bauml 1967, p. 212). This hypothesis was supported when internals were found to make more errors on a learning task in the chance situation than in the skill

situation, while externals made more errors in the skill situation.

The interpretation of the above finding was rather complex. Two additional results must be pointed out, however, before it can be considered. In the incongruent situations the subjects asked for more practice trials than when they were in congruent situations. Also, when the subjects responded to questions about their level of anxiety in each situation, no significant differences were obtained. The investigators concluded that, perhaps, the subjects made more errors in incongruent situations not because they were anxious but, rather, because they were not motivated. This tentative proposition requires further investigation.

The study by Lipp, Kolstoe, and James (1968) of denial of disability by the disabled as a function of locus of control has relevance for situational expectancy. It will be recalled that internal subjects were more denying of their disability than externals. A possible explanation for this difference is that

...The performance of the internally controlled subject who is placed in an external situation, that is, one in which he has no control of the outcome of events, will be more disrupted than the performance of the externally controlled subject who is placed in an internal type situation, that is, one in which he does have control of events. Since the disabled person is in an external type of situation, it would be consistent that the internally controlled subject would be more threatened and hence more denying than the externally controlled subject (Lipp, Kolstoe, and James 1968, p. 74).

Confirmation of the proposed relationship between situation-locus of control incongruence and threat resulting in denial is needed.

A recent study by Srull and Karabenick (1975) considered the effects of various personality and situational differences in locus of control on cheating behavior. The results "demonstrated that congruence between personality and situational determinants of locus of control results in higher rates of cheating than incongruence. . . ." (p. 625). This finding was interpreted to reflect the higher reward value that Rotter and Mulry (1965) proposed occurred under congruent situations. In other words, it was the increased value placed on a reward in congruent situations that motivated subjects to cheat. This significant increase in reinforcement value that obtains with congruency of locus of control and situation has important implications for behavioral prediction.

Studies reviewed in relation to locus of control and situation-specific expectancy have demonstrated that internals perform better than externals under conditions where skill is perceived to control the outcome, while externals perform better than internals in chance-determined conditions. Conflicting explanations have been offered to account for this finding, including an increased reinforcement value and subsequent increase in motivation during

congruent situations, and increased anxiety during incongruent situations which negatively affects performance.

If social learning theory was to be applied in health situations, it would be essential to determine how the nature of the health situation was perceived. It would have to be known whether a situation or outcome was viewed as skill-controlled or chance-controlled. No reported research in the health care area has attempted to characterize the nature of the situation. Only well-designed, future research can clarify the nature of the relationship between personality and situation and their complex effect on behavior.

### Summary

This chapter has reviewed the current state of knowledge of the myocardial infarction patient's convalescence. Inconsistencies and deficiencies in this knowledge have been identified, as well as the need for the utilization of theory to direct practice and research efforts. Social learning theory has been examined as a framework in regard to its possible utility for the explanation and prediction of the infarction patient's behavior during early convalescence. Research findings concerning social learning theory in a variety of situations have been presented.

Based on the review of literature, several variables were identified which are believed important to an

understanding of the recovery process. It is the relationship between these variables and social learning theory variables which will be determined by the proposed study. The identification of existing relationships may enhance the nurse's ability to predict a patient's level of risk for poor recovery.

The psychological variables which will be considered in this study are anxiety, depression, and denial. In several studies these variables were found to affect the course of the myocardial infarction patient's recovery and a determination of their relationship to social learning theory variables will be made.

Health knowledge and information-seeking are the cognitive variables which will be examined. Based on research findings, these variables may be differentially related to social learning theory variables.

An attitudinal variable, self-perception of health status has been demonstrated to be an important determinant of recovery from infarction. Accordingly, it will be studied here to determine its possible relationship to social learning theory.

Four other variables of interest during early convalescence will be related to social learning theory variables in an attempt to identify important relationships. These variables are incidence of arrhythmia, incidence of

pain, days spent in CCU, and total days spent in the hospital.

Several physiological variables will be assessed and their relationship to behavior during early convalescence will be determined. These variables are severity of attack, incidence of myocardial infarction, prior health status, and prior cardiac status.

The sociological variables which will be examined are marital status, family structure, and social status. Lastly, the demographic variables will be age, sex, and education.

## CHAPTER III

### DESIGN AND METHODOLOGY

The design and methodology of this exploratory study is presented under the following headings: 1) overview, 2) setting, 3) sample, 4) independent variables, 5) dependent variables, 6) research instruments, 7) procedure, 8) pilot study, 9) ethical considerations, 10) assumptions, 11) limitations, and 12) data analysis.

#### Overview

The general methodology for this exploratory study involved the collection of the Rotter Internal-External Locus of Control, Health Locus of Control, Multiple Affect Adjective Check List, Knowledge, and Attitude measures from myocardial infarction patients during early convalescence. These measures were then submitted to appropriate correlation and regression analyses.

#### Setting

Six privately owned general hospitals located in a large metropolitan area in the southwestern United States were utilized as study settings. The hospitals ranged in size from 350 to 1,000 patient beds and had similar patient



populations. Each of the hospitals had a coronary care unit and myocardial infarction patients in each hospital were usually transferred from the coronary care unit to a step-down telemetry unit. Study patients were always approached after transfer from the coronary care unit.

At the time of this study, none of the hospitals conducted formal in-patient education programs or counseling programs for patients with myocardial infarction. Patient education and counseling were the responsibility of the private physician and staff nurses assigned to the patient. Two of the hospitals routinely showed the film "My Heart Attack" by Trainex to patients, as well as providing American Heart Association literature on myocardial infarction. Another hospital routinely provided American Heart Association literature.

### Sample

The study sample consisted of ninety-five male and female patients who were hospitalized for an acute myocardial infarction and who consented to participation in the study. The diagnosis of myocardial infarction was documented by clinical history, electrocardiographic changes, and serum enzyme changes. Each patient admitted to the study also met the following criteria: 1) 35 to 70 years of age; 2) no obvious cognitive, psychological, or physical

difficulties which would preclude participation; 3) no extraordinary clinical course which would distinguish the patient from other typical myocardial infarction patients (e.g., prolonged hospitalization, multiple complications, extra-cardiac complications).

Of the ninety-five patients who gave consent and were admitted to the study, only eighty-four patients provided data which could be utilized for study purposes. Those eleven patients not able to complete the data comprised two categories. Six of the patients felt they were unable to complete the data after initial participation, and they withdrew from the study. The remaining five patients were discharged from the hospital earlier than had been anticipated and they were unable to complete the data while hospitalized. They were encouraged to complete the data as soon as possible at home and to return the research instruments in a stamped, self-addressed envelope provided by the investigator. None of these five were returned, however, in time for data analysis.

In addition to the study sample, there were seven patients, eligible for admission to the study, who declined participation when approached by the investigator. Some of these patients said they could not read well enough to participate, some were very depressed and said they did not feel like answering questionnaires, and some said they

would just rather not participate if it was not essential. None of these patients were pressured in any way after indicating they did not wish to participate. It is of interest that only two physicians of 104 who were contacted regarding this study, declined to have their patients approached for study participation.

### Independent Variables

Due to the ex post facto design of this study, there were no directly manipulated independent variables. Rather, there were several attribute, or classification, variables whose values were measured and then correlated with or regressed on selected dependent variables.

Each of the following study variables is both conceptually and operationally defined:

#### Social Learning Theory Variables

##### 1. Locus of Control:

a determination of the degree of internality or externality with which the individual views life in general

score obtained on the Rotter Internal-External Locus of Control Scale (higher scores = externality, lower scores = internality)

##### 2. Health Locus of Control:

a determination of the degree of internality or externality with which the individual views the health situation in general

score obtained on the Health Locus of Control Scale (higher scores = externality, lower scores = internality)

3. Health Value:

the extent to which an individual operationalized past health values regarding selected aspects of preventive health care

score obtained on items 34 through 39 of the Attitude Questionnaire (higher scores = higher health value, lower scores = lower health value)

4. Perception of Psychological Situation:

a determination of the individual's view of the recovery from infarction situation as either skill or chance controlled

score obtained on item 26 of the Attitude Questionnaire (1 = skill-controlled, 2 = chance-controlled)

5. Situation-Locus of Control Congruency/Incongruency

a determination of congruency or incongruency regarding the individual's expressed view of the psychological situation and his locus of control

score obtained from interrelating Locus of Control value and Perception of Psychological Situation value (congruency = internal-skill, external-chance; incongruency = internal-chance, external-skill)

### Physiological Variables

6. Prior Health Status:

a determination of whether an individual has a negative medical history, an acute history, a chronic history, or a combination of an acute and chronic history

7. Prior Cardiac Status:

a determination of whether an individual has a positive or negative history regarding the experience of cardiac symptoms or disease (1 = positive history, 2 = negative history)

## 8. Severity of Attack:

a determination of the clinical severity of the myocardial infarction, based on admitting blood pressure, patient age, heart size, lung fields, location of infarction and previous ischemia

score obtained on the Norris Coronary Prognostic Index (higher scores = greater severity, lower scores = lower severity)

## 9. Incidence of Myocardial Infarction:

a determination of whether an individual had experienced a first or second myocardial infarction

Demographic Variables

## 10. Age:

a determination of the individual's age in years

## 11. Sex:

a determination of the individual's gender

## 12. Education:

a determination of the highest completed level of formal education

Sociological Variables

## 13. Marital Status:

a determination of whether an individual is married, widowed, single, divorced, or separated

## 14. Family Structure:

a determination of whether an individual has a spouse and/or children in the home, others in the home, or lives alone

## 15. Social Status:

a determination of social status on the basis of highest educational level obtained and occupation

score obtained on the Hollingshead Two Factor Index of Social Postion

### Dependent Variables

There were several dependent variables utilized in this study. Each dependent variable is listed with its conceptual and operational definition.

### Psychological Variables

## 1. Anxiety:

an emotional state or condition which is characterized by subjective, consciously perceived feelings of tension and apprehension

anxiety score obtained on the Multiple Affect Adjective Check List (higher scores = higher anxiety, lower scores = lower anxiety)

## 2. Depression:

an alteration of affect which is characterized by a low self-esteem

depression score obtained on the Multiple Affect Adjective Check List (higher scores = higher depression, lower scores = lower depression)

## 3. Denial I:

a determination of whether an individual believes he has experienced a myocardial infarction

score obtained on item 2 of the Attitude Questionnaire

## Denial II:

a determination of the degree to which an individual admits to fear, worry, or concern regarding his myocardial infarction and its possible effects

score obtained on item 22 (f, g, h, i, j, k) of the Attitude Questionnaire (higher scores = greater denial, lower scores = lesser denial)

Cognitive Variables

## 4. Health Knowledge:

a determination of the individual's knowledge in the following areas regarding myocardial infarction: etiology, definition, healing process, risk factors, control of risk factors, and self-care.

score obtained on the Knowledge Questionnaire (higher scores = greater knowledge, lower scores = lesser knowledge)

## 5. Information-Seeking I:

a determination of the amount of information an individual obtained from the doctor or nurse regarding specific areas of care

score obtained on items 10 through 14 of the Attitude Questionnaire (higher scores = more information, lower scores = less information)

## Information-Seeking II:

a specific determination of those items about which an individual wishes more information (higher scores = wish more items of information, lower scores = wish fewer items of information)

score obtained on item 23 of the Attitude Questionnaire

Attitude Variable

## 6. Self-Perception of Health Status:

a determination of an individual's view of the severity of his myocardial infarction, his present state of health, the outcome of his recovery, and his risk for a future myocardial infarction

score obtained on items 3, 4, 5, and 7 of the Attitude Questionnaire (higher scores = poorer perception, lower scores = better perception)

Recovery Variables

## 7. Incidence of Arrhythmia:

a determination of whether a patient required any antiarrhythmic therapy (e.g., medication, pacemaker) during hospitalization (1 = yes, 2 = no)

## 8. Incidence of Pain:

a determination of whether a patient experienced cardiac pain after his first 24 hours in the hospital (1 = yes, 2 = no)

## 9. Days in CCU:

the number of days spent in the coronary care unit determined by subtracting date of CCU admission from date of CCU discharge

## 10. Days in Hospital:

the total number of days spent in the hospital determined by subtracting date of hospital admission from date of hospital discharge

Research Instruments

Five research instruments were utilized in this study.

Three of the instruments were well-known with established validity and reliability. The remaining two instruments



were developed by the investigator with the assistance of a panel of judges and were tested and revised during the pilot study. The instruments discussed in this section include the 1) Rotter Internal-External Locus of Control Scale, 2) Health Locus of Control Scale, 3) Multiple Affect Adjective Check List, 4) Knowledge Questionnaire, and 5) The Attitude Questionnaire.

#### Rotter Internal-External Locus of Control Scale

A description of the historical development of this scale can be found in a monograph by Rotter (1966). The current scale, which has a forced choice format, consists of twenty-nine items of which six items are fillers (Appendix A). Each item consists of an internal statement paired with an external statement. One point is given for each external statement selected as an answer and scores can range from zero to twenty-three. Low scores tend to reflect internality, while high scores reflect increasing externality.

The I-E Scale is additive and is a measure of the generalized expectancy with which persons perceive contingency relationships between their actions and their outcomes. Small negative correlations ( $-.07$  to  $-.35$ ) have been reported between the I-E Scale and the Marlowe-Crowne Desirability Scale suggesting that "...while the I-E Scale

is probably not entirely free from the effects of social desirability, it would be incorrect to conclude that the scale is seriously impaired" (Phares 1976, p. 43).

Correlations between intelligence measures and I-E Scale scores have been found to be negligible (Rotter 1966). On occasions, I-E scores have been related to sex, ethnic, and social class differences. These findings, however, appear to strengthen the construct validity of the scale (Rotter 1966, Phares 1976).

Construct and convergent validity of the scale have been repeatedly documented in the literature over the past ten years and have been summarized in literature reviews (Rotter 1966; Rotter, Chance, and Phares, 1972; Lefcourt 1966, 1972; Joe 1971; Phares 1976).

Reliability data are available for both internal consistency and test-retest. Internal consistency estimates range from .65 to .79, even though the scale is additive in nature (Rotter 1966). Test-retest reliability coefficients have averaged .70 for varying periods of time across groups (Robinson and Shaver 1972). The alpha reliability coefficient computed for the I-E Scale in this study was .72. The split-half reliability coefficient was .77.

Two major criticisms of the I-E Scale are that there is some evidence of social desirability response bias and that the scale is multidimensional (Nowicki and Duke 1974,

Levenson 1975). MacDonald (1972), however, disputed these criticisms by concluding:

...when one considers that (a) the correlations with measures of social desirability response bias are typically low, and (b) results of factor analyses are varied and difficult to compare...one must conclude that methodological questions have been more effectively raised than answered (p. 229).

#### Health Locus of Control Scale

Rotter (1975) encouraged the development of measures of specific expectancy, as opposed to generalized expectancy, if research interest was limited to a circumscribed area and if more precise prediction was desired. Following this suggestion, Wallston, Maides and Wallston (1976) developed the Health Locus of Control (HLC) Scale which they assumed would "...provide more sensitive predictions of the relationship between internality and health behaviors" (p. 580).

The HLC Scale (Appendix B) consists of eleven items to which a subject responds on a six-point Likert-type format. Six items are worded in an external direction and five in an internal direction. The total score is the sum of all items after reversing the scores for the internal items and it can range from eleven to sixty-six. As with the Rotter I-E scores, low HLC scores reflect internality and high scores externality.

Normative data have been reported for approximately 400 persons who are primarily college students and

outpatients (Wallston et al 1976). Mean scores have varied by group from 31.46 to 40.74 with standard deviations from 4.40 to 8.20. No differences attributed to sex have been obtained.

The scale's alpha reliability obtained from the initial sample of 98 students was .72. Based on the findings of this study, the scale's alpha reliability was .69, and the split-half reliability was .74. The discriminant validity of the scale is reflected by a  $-.01$  correlation with the Marlowe-Crown Social Desirability Scale. A correlation of  $.33$  ( $p < .01$ ) with the Rotter I-E Scale, reported for the original sample, supports initial convergent validity without the loss of discriminant validity.

In early research with the scale, significant findings were obtained which would not have been had only Rotter's more general I-E Scale been utilized (Wallston et al 1976). Although preliminary use of the scale has been encouraging, validity and reliability data remain limited.

### Multiple Affect Adjective Checklist

#### "Today" Form

The Multiple Affect Adjective Check List (MAACL) is an extension of the Affect Adjective Check List and it yields three measurements of affect--depression, anxiety, and hostility. The test contains 132 alphabetically arranged

adjectives for which a subject is asked to check all words which describe his feelings (Appendix C). The test manual (Zuckerman and Lubin 1965) provides detailed information on the historical development and norming of the test.

A number of studies testing the validity of the instrument have been reported (Zuckerman and Lubin 1965), particularly regarding anxiety scores. The anxiety subscale has well-established construct validity and statistically significant concurrent validity with several other anxiety measures such as the Taylor Manifest Anxiety Scale. Anxiety scores may range from zero to twenty-one.

The depression subscale was found to be significantly and positively correlated with clinical depression ratings which had achieved an interrater reliability of .76, as well as with depression subscales of the Minnesota Multiphasic Personality Inventory. Depression scores may range from zero to forty. The fact that the hostility subscale has achieved little validity is not of great concern, for it was not used in this study.

Internal reliability coefficient for the "today" form of the MAACL are in the range of .79 to .90. Retest reliability over one week is low, as would be expected for an instrument which measures affect state rather than trait.

A point requiring emphasis is the documentation of high intercorrelations between the anxiety and depression

scales. "...whether this results from a lack of discriminant validity of the instrument or reflects true intercorrelations among anxiety, depression, and hostility is not known" (Kelly 1972, p. 112). Kelly goes on to say, "In spite of the very high interscale correlation...the three scales of the MAACL appear to have sufficient differential validity to reflect meaningful changes in affect... (p. 112).

#### Attitude Questionnaire

The 44-item Attitude Questionnaire was developed by the investigator to determine the values of the following study variables: denial of infarction and illness; perception of health status; perception of the psychological situation, operationalized past health value, and information seeking (Appendix D). Additionally, the Attitude Questionnaire provides data regarding propensity toward adoption of the sick role, stress index, belief in prescribed therapy, source of information regarding illness, amount of family concern, Type A versus Type B behavioral trend, views of recovery, and expected compliance. These latter variables were not of direct concern to this study.

The questionnaire was developed based on prior research which indicated variables related to adjustments and convalescence which were expected to be important to the problem of this study (Kercher, Taylor, and Ackerman

1976; Mechanic and Volkart 1961; Garrity 1973; Sackett and Haynes 1976; Cay et al 1972; Rotter 1966; Davis 1963).

Several questionnaire items were taken directly from the above works while the remaining items were developed by the investigator. The questionnaire was reviewed by a panel of three judges to determine face and content validity. Agreement of two of three judges was required for an item or scale to be included on the questionnaire. The questionnaire was pretested during the pilot study and necessary revisions were made. The subscales or items which were used to determine major study variables are discussed separately.

### Denial

Item 2 of the Attitude Questionnaire was utilized to determine whether an individual believed he had experienced a myocardial infarction. This item has been used in prior research (Croog, Shapiro, and Levine 1971) where it was accepted to have validity and reliability as a measure of this type of denial.

An additional measure of denial was obtained by utilizing a score obtained on item 22 of the Attitude Questionnaire. Responses to the likert scales on parts f, g, h, i, j, and k of item 22 were summed to yield the denial score which could range from six to thirty. This item asked a patient to express how frequently he experienced

fears or worry concerning his myocardial infarction or its possible effects. Higher scores tend to reflect more denial. This item, initially developed by Kercher, Tayler and Ackerman (1976), has not previously been used to obtain a denial score except during the pilot study. It does appear to have the same content validity of other measures used to determine denial of the meaning of a myocardial infarction (Stern, Pascale, and McLoone 1976; Froese et al 1974).

#### Perception of Health Status

A summary score obtained on four items of the Attitude Questionnaire was used to reflect a patient's perception of his health status. These items--3, 4, 5, and 7--determined a patient's view of the severity of his myocardial infarction, his present state of health, the expected outcome of his recovery, and his risk for a future myocardial infarction. The scale was pretested during the pilot study and is believed to have content validity. The score for this variable may range from three to twenty, with higher scores indicating a poorer perception of health status.

#### Perception of the Psychological Situation

A determination of the patient's view of the nature of the recovery situation from infarction as either skill or chance-controlled was obtained by response to item 26 of the



Attitude Questionnaire. A revision, based on pilot findings, of an earlier measure of this variable resulted in the current measure.

#### Operationalized Past Health Value

The extent to which a patient operationalized past health values regarding preventive health care was determined by items 34 through 39 on the Attitude Questionnaire. This scale was developed by the investigator when another measure used in the pilot study resulted in zero variability for value placed on health. This scale seeks to determine in what ways health value may have been reflected or operationalized in selected situations, and scores may range from zero to twenty-one with higher scores indicating a higher health value.

#### Information-Seeking

Information-seeking was measured in two ways for this study. The first measure was a determination of the amount of information a patient had obtained regarding his myocardial infarction and care. Items 10 through 14 of the Attitude Questionnaire were used to obtain the score which could range from one to five, with higher scores reflecting more information.

The second measure was a determination of those specific areas about which a patient sought more information.

Item 23 of the Attitude Questionnaire was used to obtain the score which could range from zero to twelve, with higher scores reflecting a greater identified seeking for information. Both measures were tested in the pilot study and were found acceptable.

### Knowledge Questionnaire

A twenty-six item Knowledge Questionnaire was developed by the author for the purpose of this study (Appendix E). Literature was reviewed to determine appropriate information that is generally included in teaching programs for myocardial infarction patients (Niccoli and Brammell 1976; Johnston, Cantwell, and Fletcher 1976; Aspinal 1968; Firelit 1967; Goldbarg 1973; Groden 1971; Kos 1969; Guzzetta 1977). Other knowledge tests which have been developed for myocardial infarction patients were also reviewed (Kercher, Taylor and Ackerman 1976; Johnston, Cantwell, and Fletcher 1976; Rahe et al 1975; Crawshaw 1974).

The present test includes items from other tests, in addition to items developed by this investigator. The items represent the following content areas: normal cardiac function, myocardial infarction (etiology, damage, healing and recovery, treatment), risk factors for coronary artery disease, early warning signs for infarction, emergency care, and rehabilitation concerns. Scores on the Knowledge Questionnaire can range from zero to thirty seven.

The Knowledge Questionnaire was administered to a heterogeneous sample of ninety-three well adults and the split-half reliability coefficient was determined to be .84. An item analysis was also conducted to determine difficulty and discrimination indices. This information was utilized to delete items not contributing to score variance, and to increase the attractiveness of some item distractors. The Knowledge Questionnaire was then pretested on a group of myocardial infarction patients during the pilot study with satisfactory results.

#### Procedure

Patients who met study criteria were located in six metropolitan hospitals from which permission to conduct the study had been obtained (Appendix F). Written or verbal permission from each patient's private physician was also obtained before the patient was approached (Appendix B). A patient was not approached until he had been out of the coronary care unit for at least five days. This period was decided upon to allow each patient the opportunity for initial adjustment and stabilization following transfer from the coronary care unit. Each potential subject was visited by this investigator for an explanation of the study. Those patients who agreed to participate and who signed consent forms were admitted to the study (Appendix H).

The patient was asked to complete the following research instruments which were provided in a packet: Rotter's Internal-External Locus of Control Scale, Health Locus of Control Scale, Knowledge Questionnaire, Attitude Questionnaire, and the Multiple Affect Adjective Check List. Each instrument was briefly described to the patient and the directions accompanying each instrument were pointed out. The order of presentation for the instruments was randomized for each patient. No patient was requested to fill out research instruments who was judged to be physically uncomfortable, physically unstable, or who was being medicated with other than the usual dosages of tranquilizers. Evaluation of the patient's ability to participate was determined primarily by the investigator, in collaboration with the staff nurse responsible for his care.

The patient was informed that the investigator would check back with him the next day to determine if he had been able to complete the research instruments. The investigator's telephone number was left with the patient for any questions which might arise. The patient was instructed as to the importance of independent completion of the research instruments, and his verbal agreement was obtained.

The investigator would check back the next day to procure the research packet and answer any questions the patient might have regarding the study. The large majority

of patients were able to complete the research instruments within one to two days. On occasion, however, a patient would require extra time and this was granted so that undue pressure was not exerted upon a patient recovering from myocardial infarction.

In addition to the self-report data, the investigator collected the following data from each patient's medical chart: medical history, incidence and type of complications associated with the myocardial infarction, and current health status (Appendix I).

#### Pilot Study

The testing of the research instrument constituted the general design of the pilot study. The Rotter Internal-External Locus of Control Scale, Health Locus of Control Scale, Multiple Affect Adjective Check List, Knowledge Questionnaire, Attitude Questionnaire, and Health Value Scale were administered to seven patients hospitalized for myocardial infarction. In addition, the Medical Record Summary form was utilized to gather information from each patient's chart.

As a result of the pilot study, the Health Value Scale was deleted as a research instrument due to the zero variability resulting from its use. Also, necessary revisions of the Attitude Questionnaire were made. It was concluded

that the remaining research instruments would be used in the final study. Problems in administering the research instruments were identified and procedural proficiency was increased. No statistical analysis was performed on the pilot data due to the small number of subjects.

### Ethical Considerations

A patient was admitted to the study only after implementation of the following ethical considerations. Each patient selected for inclusion in the study was informed of the general nature of the study, as well as the specific nature of his participation. The voluntary nature of participation in the study was also emphasized. In addition, each patient signed a written consent form which included the following basic elements: 1) a description of the study purpose and procedure, 2) a description of any expected risk or discomfort, 3) a description of the expected benefits of participation, 4) an offer to answer any questions concerning the procedure, and 5) an instruction that the subject was free to withdraw his consent and to discontinue participation in the study at any time (Appendix H).

Patients were also informed that data confidentiality would be maintained. Patient anonymity was assured by use of code numbers and the raw data remained under the control of the investigator.

### Assumptions

The assumptions basic to this study were:

1. Behavior can be a function of the individual's expectancy for reinforcement, the reinforcement value, and the psychological situation (Rotter 1954).
2. Systematic understanding of convalescence behavior is necessary for the design of effective rehabilitation interventions.
3. Self-reports of behavior are both valid and reliable.

### Limitations

The following limitations of this study are acknowledged:

1. The population to which the research findings can be generalized will be limited by the use of a non-random sample.
2. The inability to assert rigorous control during data collection in the clinical setting may affect findings in unknown ways.
3. The multiple correlations computed in this investigation may have resulted in some degree of probability pyramiding.

### Analysis of Data

Pearson product-moment and eta correlation coefficients provided the data analysis for hypotheses one through six.

The acceptance or rejection of each null hypothesis was based on the significance or non-significance of the correlation coefficients. The alpha level utilized in this study was .05.

Multilinear regression utilizing the forward stepwise inclusion method provided the data analysis for hypothesis seven. A determination of the significance of  $R^2$ , the coefficient of determination, provided the test of the hypothesis.

Additional data analytic techniques included:

1. Means, median, mode, standard deviation, and range were computed for each interval score variable.
2. Frequency counts and percentages were computed for each interval dichotomous variable and each nominal variable.
3. Kolmogorov-Smirnov One-Sample Test was used to determine the presence of a normal distribution for selected variables.
4. Alpha and split-half reliability coefficients were computed for the Rotter Internal-External Locus of Control Scale and the Health Locus of Control Scale.
5. Analysis of variance was utilized to determine the presence of significant differences in data collected from the six hospitals used as settings for the study.



6. Partial correlation coefficients were computed in selected cases to more clearly determine relationships between variables.

Statistical analyses of data were performed with selected programs from the Statistical Package for the Social Sciences (Nie et al 1975).

## CHAPTER IV

### FINDINGS OF THE STUDY

#### Introduction

This study was conducted to determine the applicability of social learning theory as a framework for the explanation and prediction of early convalescence behavior of the myocardial infarction patient. Data were collected through the use of three scales and two questionnaires administered to study subjects during the latter stage of hospitalization for myocardial infarction.

In the initial section of this chapter, a description of the study sample is provided. Subsequent sections describe the findings of the study resulting from the measurement of study variables and testing of study hypothesis. The adopted level of significance was .05. The raw data are found in Appendix J.

#### Description of the Sample

For the purposes of this analysis, the study sample consisted of eighty-four myocardial infarction patients. The patients were recruited from six private hospitals in a metroplex region of the southwestern United States. Before

patient data from each of the hospitals were pooled, they were examined for statistical differences. Group means were examined on major study variables and no significant differences between patient groups were found.

The study sample is described in this sample in terms of the following demographic and sociological variables: age, sex, education, race, marital status, family structure, and social status.

#### Age

As seen in Table 1, the mean age for the sample was 54.93 + 9.45 SD. Patients ranged in age from thirty-one to seventy, and the large majority of patients were older than fifty years of age (Figure 1).

TABLE 1

#### DESCRIPTIVE STATISTICS FOR AGE\*

Mean	Median	Mode	S.D.	Range
54.93	55.83	55.00	9.45	39

\*N=84

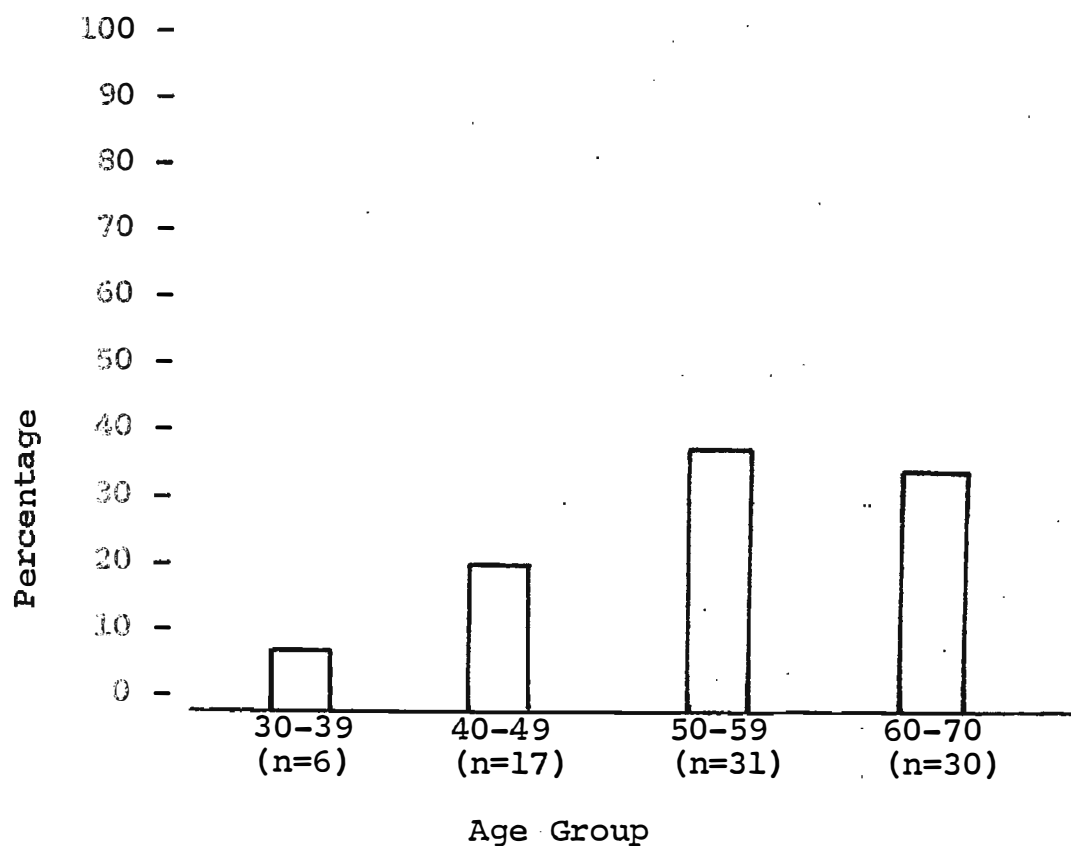


Fig. 1 Distribution of Sample by Age.

### Sex

The sex of study patients is summarized in Table 2. It can be seen that there were six times as many men as women in the sample. This proportional disparity was not unexpected as the incidence of heart disease in this country is much higher in men than in women (American Heart Association 1976).

TABLE 2

## SEX DISTRIBUTION OF SAMPLE\*

Sex	N	Percent
Male	72	86%
Female	12	14%

\*N=84

## Race

An examination of the sample by race revealed that seventy-nine patients (94%) were white, four (5%) were black, and one (1%) was latin. Based on the overwhelming majority of white patients, race was not utilized as a variable in subsequent analyses.

## Education

The unit of measurement for education was the highest number of years completed. In Table 3 it can be seen that the mean level of education completed in years was 12.12 + 2.63SD. Figure 2 provides a more detailed analysis of educational levels and it can be seen that seventy-two percent of the sample completed a high school education or higher.

TABLE 3

## DESCRIPTIVE STATISTICS FOR EDUCATION\*

Mean	Median	Mode	S.D.	Range
12.12	12.05	12.00	2.63	13.00

N=84

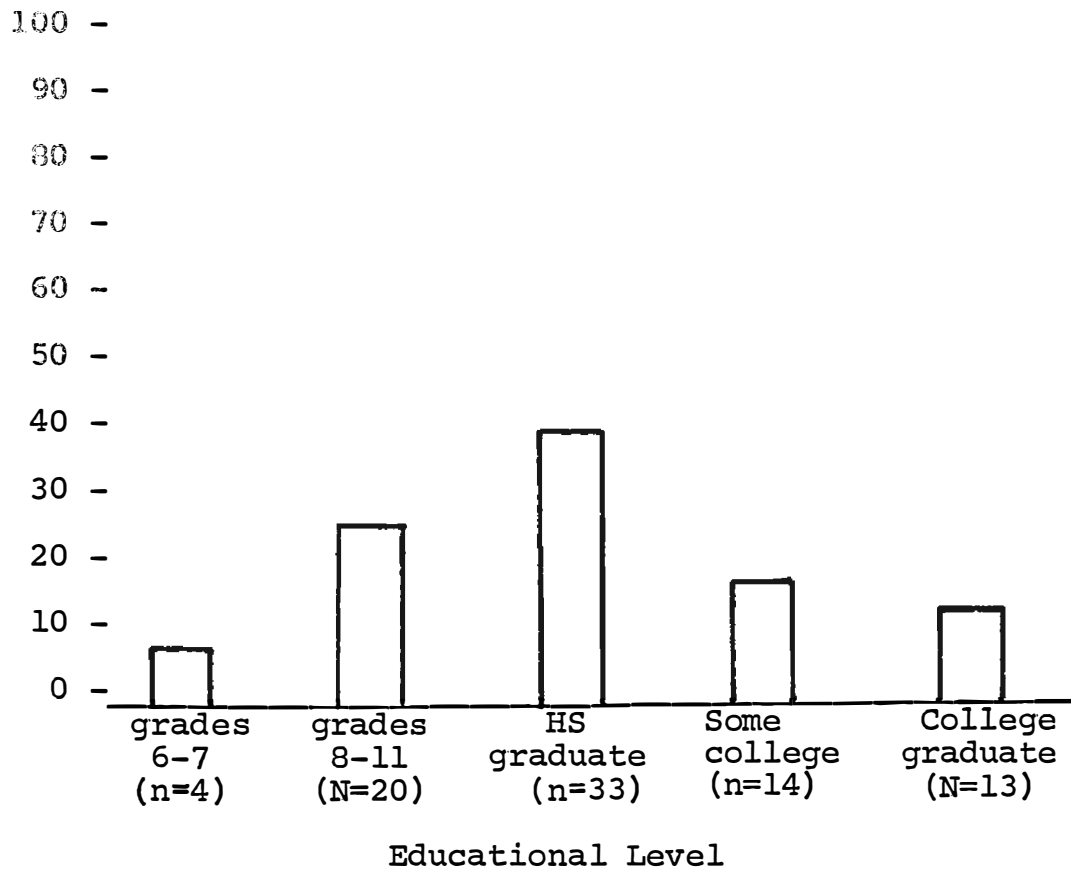


Fig. 2 Distribution of Sample by Education.

## Marital Status

As seen in Table 4, 81% of the sample was married. The remaining 19% was either widowed, divorces, single, or separated. As with race, since the contribution of marital status to variance was limited it was not used in subsequent analyses.

TABLE 4

## MARITAL STATUS DISTRIBUTION OF SAMPLE\*

Marital Status	N	Percent
married	68	81%
widowed	3	4%
single	7	8%
divorced .	5	6%
separated	1	1%
*N=84		

## Family Structure

The variable, family structure, was utilized to determine the nature of the structure within which the patient lived at home. The most frequent family structure (see Table 5) was that of living with only a spouse, which occurred in almost 50% of the cases. An additional 33% of the patients had children, as well as a spouse, living in the home. Only 14% of the patients lived alone.

TABLE 5

## FAMILY STRUCTURE DISTRIBUTION OF SAMPLE\*

Family Structure	N	Percent
Children and Spouse	28	33%
"Others" in Home	3	4%
Spouse Only	41	49%
Alone	12	14%
*N=84		

## Social Status

Social status was determined for this study by the Hollingshead Two Factor Index of Social Position (Hollingshead and Redlich 1958). This index is based upon the summation of a weighted education score and a weighted occupation score. Figure 3 graphically displays the proportion of the sample which was assigned to each level of the education and occupation scales. Almost one-third of the sample was in occupation category 4 which represented clerical and sales workers, technicians, and owners of little businesses. The next two most frequent occupational categories were 3 and 5, of which 3 represented administrative personnel, owners of small businesses, and minor professionals, while 5 represented skilled manual employees.



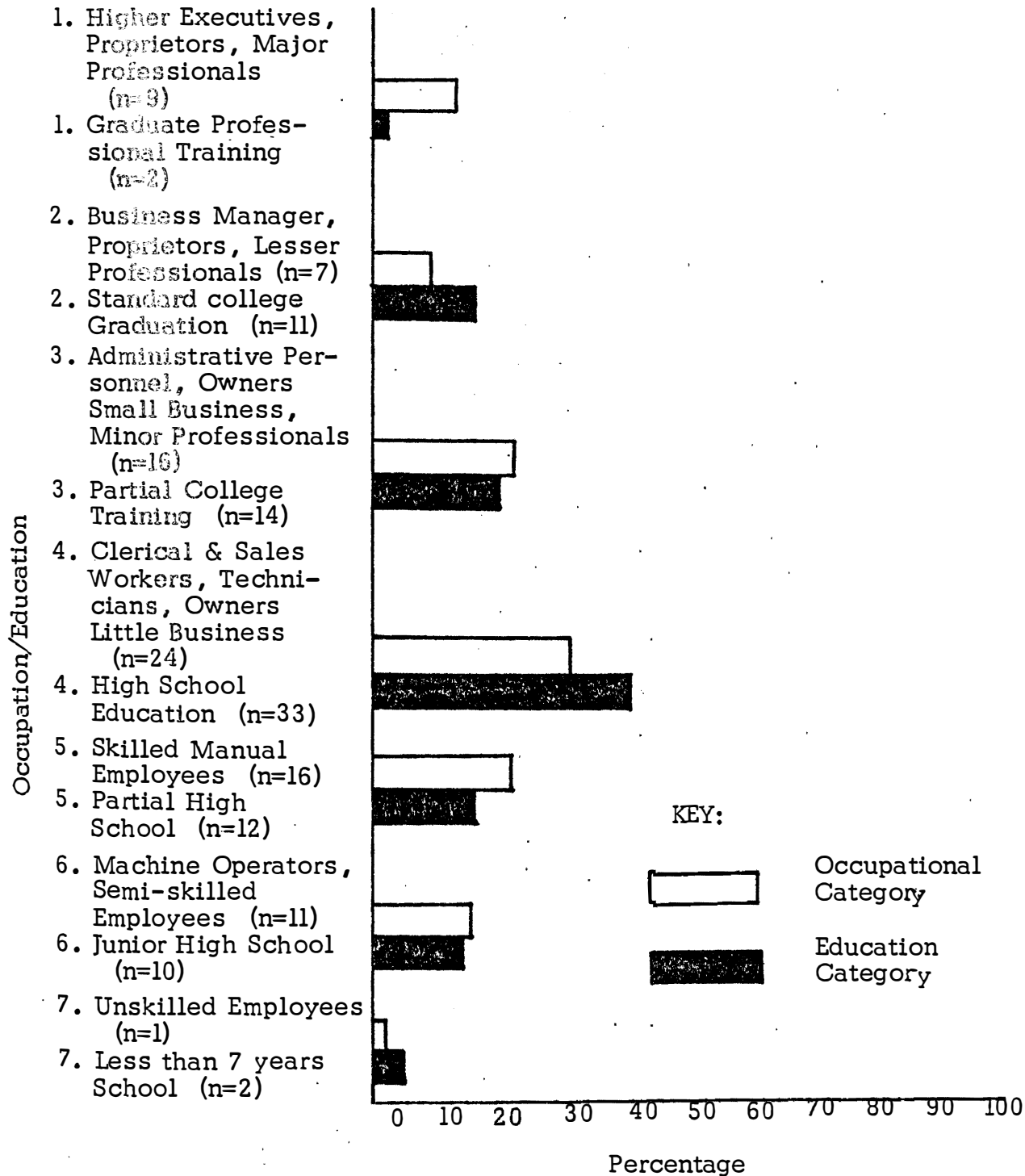


Fig. 3. Distribution of Sample by Education and Occupation

When education completed was rated on the Hollingshead education scale, the sample distribution over the seven categories was approximately symmetrical with high school graduation, category 4, being the most common achievement. Over 70% of the sample had a high school education or higher.

As stated earlier, a patient's weighted rating on occupation and education determined his assignment to one of five social classes, I - V. Table 6 displays the sample distribution of social class based on the Hollingshead Index. It can be seen that Class III accounted for the largest group of subjects, 43%. The distribution appears slightly skewed in that Classes I and II accounted for only 20% while Classes IV and V accounted for 37% of the sample.

TABLE 6

## SOCIAL CLASS DISTRIBUTION OF SAMPLE\*

Hollingshead Index Social Position	N	Percent
I	7	8%
II	10	12%
III	36	43%
IV	29	35%
V	2	2%

\*n=84

### Description of Study Variables

Descriptive data for study variables in the following categories is provided in this section; social learning theory, physiological, recovery, psychological, cognitive, and attitude.

#### Social Learning Theory Variables

The following variables derived from social learning theory were measured for this study: locus of control, health locus of control, health value, perception of psychological situation, and situation-locus of control congruency/incongruency. The nature of each variable, as measured in the study sample, is described in this subsection.

#### Locus of Control

Locus of control was determined by the Rotter Internal-External Locus of Control Scale (I-E Scale). The score obtained on the scale indicated the degree of internality or externality with which a patient viewed life in general. The range of possible values for the scale was zero to twenty-three and the sample scores ranged from one to eighteen. The mean score for the sample was  $7.47 \pm 3.70$  SD.

In Table 7 the sample performance is compared with that of other samples reported in the literature. The sample of myocardial infarction patients utilized for this study

tended to be more internal than presurgical patients and patients experiencing a life crisis. The study sample was also slightly more internal than college students and an overall reported grand mean for multiple samples. The only reported group with a mean I-E score more internal than the study sample was a group of Peace Corp trainees.

TABLE 7

ROTTER INTERNAL-EXTERNAL LOCUS OF CONTROL SCALE  
MEANS AND STANDARD DEVIATIONS FOR  
VARIOUS SAMPLES

Sample	N	Mean	S.D.	Median
*Myocardial Infarction Patients	84	7.47	3.70	7.13
Marston's MI Patients (Marston 1970)	28	-----	-----	8.50
Pre-Surgical Patients (Lowery 1975)	91	10.1	4.2	-----
Crisis Patients (Smith 1970)	30	10.08	---	-----
Non-Crisis Patients (Smith 1970)	30	9.63	---	-----
Ohio State University College Students (Rotter 1966)	1180	8.29	3.97	-----
Kansas State University College Students (Rotter 1966)	113	7.73	3.82	-----
University of Connecticut College Students (Rotter 1966)	303	9.22	3.88	-----

TABLE 7 (Continued)

Sample	N	Mean	S.D.	Median
Peace Corp Trainees	155	5.94	3.36	----
Owen's Review & Summary of Reported Means and S.D.'s (MacDonald 1973)	4433	8.3	3.9	----
*Study Sample				

The sample distribution (Figure 4) appeared positively skewed. When the distribution was checked for normality by the Kolmogorov-Smirnov One-Sample Test (Siegel 1956), the computed statistic was K-S statistic 1.326 which resulted in a .059 2-tailed significance level. Based on this finding, the sample distribution of I-E scores was considered to be marginally normal.

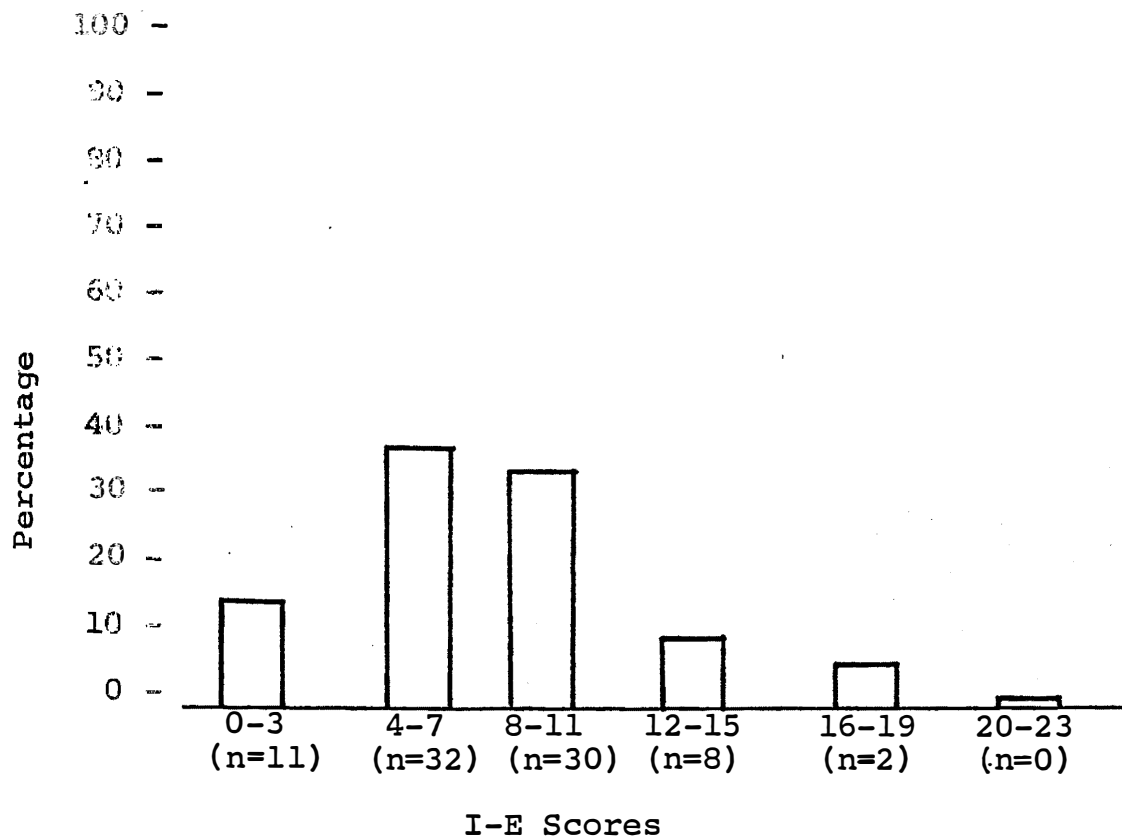


Fig. 4. Distribution of Rotter Internal-External Locus of Control Scores.

#### Health Locus of Control

The Health Locus of Control variable was concerned with how a patient viewed locus of control specifically in relation to health, and it was determined by Wallston's Health Locus of Control Scale (HLC Scale) (Wallston et al 1976). HLC scores could range from eleven to sixty-six. The mean HLC score was  $35.11 \pm 8.96$  S.D.

The sample's performance on the scale is displayed in Table 8 where it is compared with other normative data.

The infarction patients in this study revealed a health locus of control which was very similar to college students and community residents. They were considerably more internal than a group of hypertensive outpatients, however. The sample distribution of HLC scores in Figure 5 is approximately symmetrical and was found to be normal by the Kolmogorov-Smirnov One-Sample Test (K-S statistic .424,  $p = .994$ ).

TABLE 8

HEALTH LOCUS OF CONTROL SCALE  
MEANS AND STANDARD DEVIATION  
FOR VARIOUS SAMPLES

Sample	N	Mean	S.D.	Median	Range
*Myocardial Infarction Patients	84	35.11	8.96	34.83	50.00
College Students (B. Wallston et al 1976)	185	34.94	6.31	-----	-----
College Students (B. Wallston et al 1976)	94	33.08	5.35	-----	-----
Community Residents (B. Wallston et al 1976)	101	35.93	7.11	-----	-----
Hypertensive Outpatients (B. Wallston et al 1976)	38	40.05	6.22	-----	-----
*Study Sample					

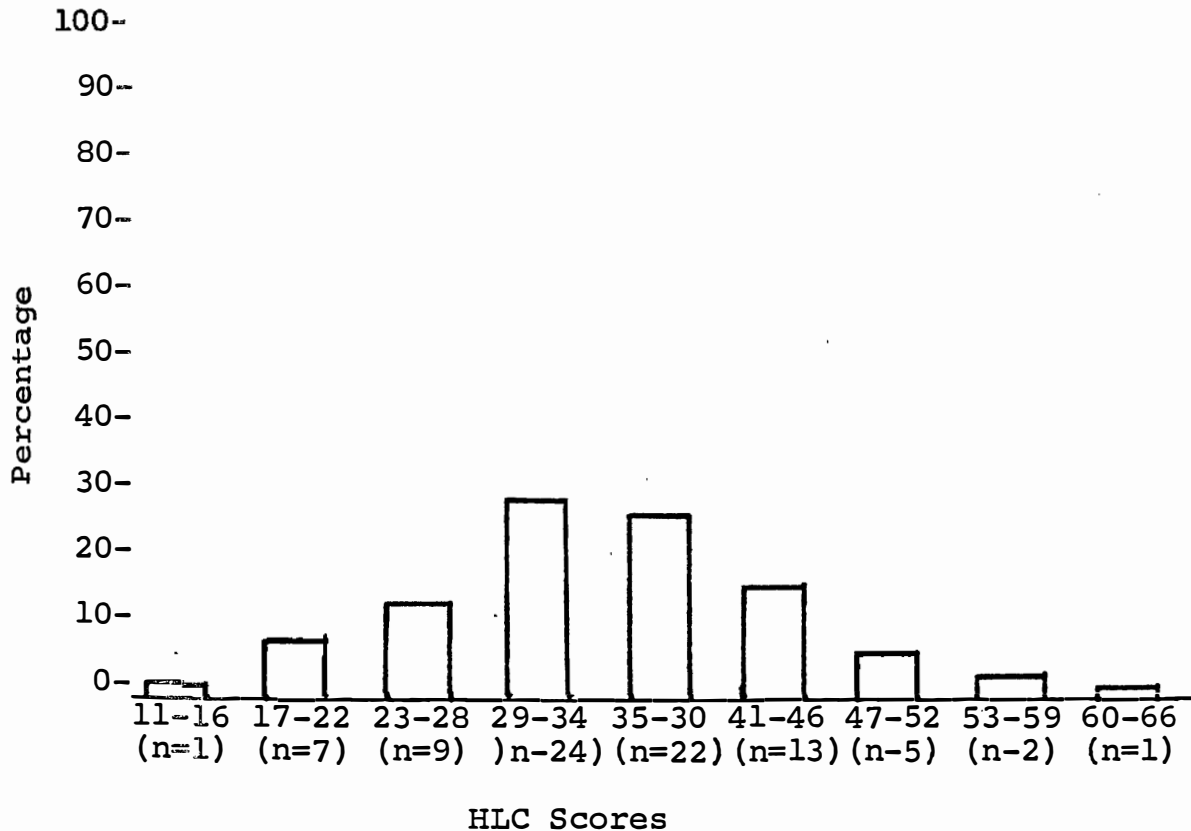


Fig. 5. Distribution of Health Locus of Control Scores.

Based on low correlations initially found during scale development between the internal and external items on the HLC Scale, Wallston recommended that separate scores be computed and examined for each subscale (personal communication). Descriptive statistics for each subscale are reported in Table 9. The range of possible values for the internal scale was five to thirty, and was six to thirty-six for the external scale. The correlation in this study between the internal and external items was  $r = .2510$ ,  $p < .05$ .



TABLE 9

## DESCRIPTIVE STATISTICS FOR HLC SUBSCALES

Subscale	Mean	Median	Mode	S.D.	Range
Internal Items	14.92	14.50	14.00	4.87	20.00
External Items	20.31	20.25	16.00	6.57	30.00

Health Value

The Health Value Scale permitted a range of possible values from zero to twenty-one and patient scores ranged through all possible value. The sample mean on the Health Value Scale was  $9.92 \pm 4.51$  SD with a median of 10.14. The sample distribution in Figure 6 is approximately symmetrical and was found to be normal by the Kolmogorov-Smirnov One-Sample Test (K-S statistic .714,  $p = .688$ ).

TABLE 10

## DESCRIPTIVE STATISTICS FOR HEALTH VALUE\*

Mean	Median	Mode	S.D.	Range
9.92	10.14	13.00	4.51	21.00

\*N=83

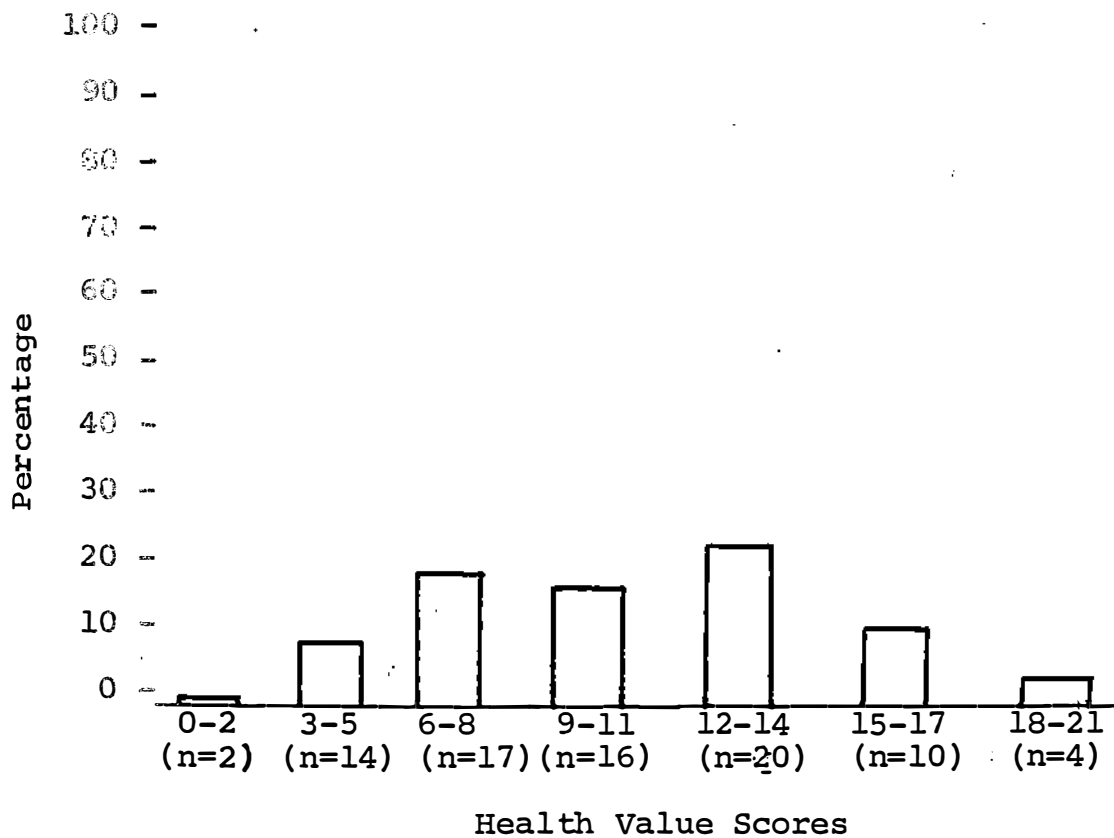


Fig. 6. Distribution of Health Value Scores.

#### Perception of Psychological Situation

Patients were asked to characterize the nature of the recovery from infarction situation as one in which they believed they could or could not control recovery outcomes. After initial examination of the distribution of scores across the four response categories for the original item, it was decided to collapse the categories from four to two. This was considered to be theoretically sound for it continued to permit differentiation of those patients who viewed recovery as skill-controlled from those who

considered it to be more chance-controlled.

It can be seen in Table 11 that 69% of the sample characterized the recovery situation as one in which skill needed to be exerted to achieve recovery, while 31% rated recovery as more dependent upon chance.

TABLE 11  
DISTRIBUTION OF PERCEPTION OF  
RECOVERY SITUATION\*

Recovery Situation	N	Percent
Skill controlled	56	69%
Chance controlled	25	31%
*N=81		

#### Situation-Locus of Control Congruency/Incongruency

A determination was made of situation-locus of control congruency/incongruency by interrelating two previously measured variables--locus of control and perception of the recovery situation. Patients were first classified as internal or external by a median split of locus of control scores. The perception of the recovery situation was then examined to determine whether a patient had characterized it as skill (internal) or chance (external). Finally, a determination was made as to whether a patient manifested a congruent (internal-skill, external-chance) or incongruent (internal-

chance, external-skill) coupling. Table 12 displays the sample distribution of scores for this variable. It can be seen that congruency between perception of the situation and locus of control was the predominant coupling.

TABLE 12

DISTRIBUTION OF SITUATION-LOCUS OF CONTROL  
CONGRUENCY/INCONGRUENCY\*

Coupling	N	Percent
Congruent	51	63%
Internal-Skill		
External-Chance		
Incongruent	30	37%
Internal-Chance		
External-Skill		

\*N=81

### Physiological Variables

The following physiological variables were measured in this study: prior health status, prior cardiac status, incidence of myocardial infarction, and severity of attack.

#### Prior Health Status

This variable was a determination of whether a patient had a negative medical history (no major illnesses or hospitalizations), an acute history (a self-limiting major illness which required hospitalization), a chronic history (a

diagnosis of chronic illness), or a combination of both acute and chronic history. This variable reflected the general past health status of a subject. Only one-fourth of the patients had a negative medical history, while one-half of the patients had experienced either acute or chronic illness. The remaining one-fourth of the sample had both acute and chronic illness history (see Table 13).

TABLE 13  
PRIOR HEALTH STATUS DISTRIBUTION  
OF SAMPLE\*

Prior Health Status	N	Percent
Negative Medical History	22	26%
Acute Illness History	24	29%
Chronic Illness History	16	19%
Acute and Chronic Illness History	22	26%

\*N=84

#### Prior Cardiac Status

A determination of whether a patient had a positive or negative history regarding the experience of cardiac symptoms or disease resulted in the score for prior cardiac status. To be considered to have a positive history, the subject must have had a prior medical diagnosis of cardiac arrhythmia, ischemia, or infarction. As seen in Table 14,

approximately one-third of the patients did have a positive prior cardiac status.

TABLE 14  
PRIOR CARDIAC STATUS DISTRIBUTION  
OF SAMPLE\*

Prior Cardiac Status	N	Percent
Positive Cardiac	26	31%
Negative Cardiac	58	69%
*N=84		

#### Incidence of Myocardial Infarction

A determination was made as to whether a patient had experienced one, two, or more myocardial infarctions. Seventy patients (84%) had experienced their first infarction and only fourteen (16%) had experienced a second infarction. No patients in the sample had suffered more than two infarctions. Due to the limited variability provided by this variable, it was not considered in subsequent analyses.

#### Severity of Attack

The severity of each subject's myocardial infarction was determined by use of the Norris Coronary Prognostic Index (Norris et al 1969). This index provided a severity score based on age, location of infarction, admitting

systolic blood pressure, heart size, lung fields and previous ischemia. Each component was weighted according to the known prognostic outcome for the value of the component. Table 15 contains the descriptive statistics for the Coronary Prognostic Index for which the values ranged from 2.40 to 12.28 with a mean score of  $5.09 \pm 1.99$  SD.

TABLE 15  
DESCRIPTIVE STATISTICS FOR CORONARY  
PROGNOSTIC INDEX\*

Mean	Median	Mode	S.D.	Range
5.09	4.36	3.52	1.99	9.88
*N=84				

The histogram in Figure 7 displays the distribution of the Coronary Prognostic Index variable in the study sample. The distribution (K-S statistic 1.741,  $p = .005$ ) was clearly positively skewed and indicated that the anticipated prognosis for the majority of the sample tended to be favorable. The original distribution from which the Index was developed was also positively skewed.

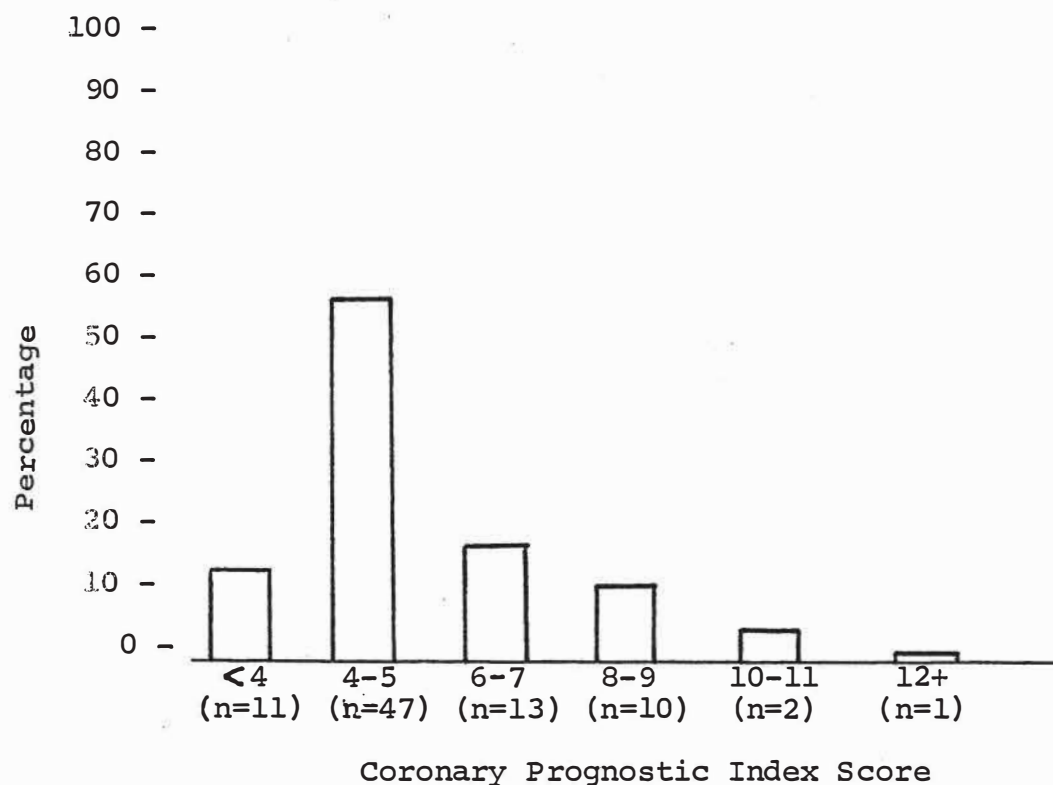


Fig. 7. Distribution of Coronary Prognostic Index Scores.

#### Recovery Variables

Incidence of arrhythmia, incidence of pain, days in CCU, and days in hospital were the variables descriptive of recovery in this study.

#### Incidence of Arrhythmia

A determination was made of whether a patient required antiarrhythmic therapy during hospitalization. Each patient was then categorized as having a positive or negative incidence of arrhythmia. Approximately 60% of the patients



experienced arrhythmias which required treatment. It is of interest that ten patients, or 12% of the sample, experienced ventricular fibrillation and were successfully cardioverted.

### Incidence of Pain

A patient was considered to have a positive incidence of pain if he experienced cardiac pain beyond the initial twenty-four period in the hospital. One-third of the patients experienced pain after twenty-four hours.

### Days in CCU

The number of days each patient spent in CCU was determined and the mean stay was found to be 4.37 days + 1.64 SD. Patients were in CCU from a minimum of two days to a maximum of ten days. The sample distribution (K-S statistic 1.457,  $p = .029$ ) on this variable was positively skewed with approximately 80% of the patients having spent five days or less in CCU.

### Hospital Days

The mean hospital stay for the sample was 13.62 days  $\pm$  4.51 SD. Table 16 displays the descriptive statistics for this variable. The mean stay of thirteen to fourteen days was comparable to the national norm for length of hospitalization for myocardial infarction. In Figure 8 it can be

seen that more than two-thirds of the sample spent fourteen days or less in the hospital. The distribution of this variable departed from normality as evidenced by a K-S statistic of 1.430,  $p = .034$ .

TABLE 16

## DESCRIPTIVE STATISTICS FOR HOSPITAL DAYS\*

Mean	Median	Mode	S.D.	Range
13.61	13.17	13.00	4.51	28.00

\*N=84

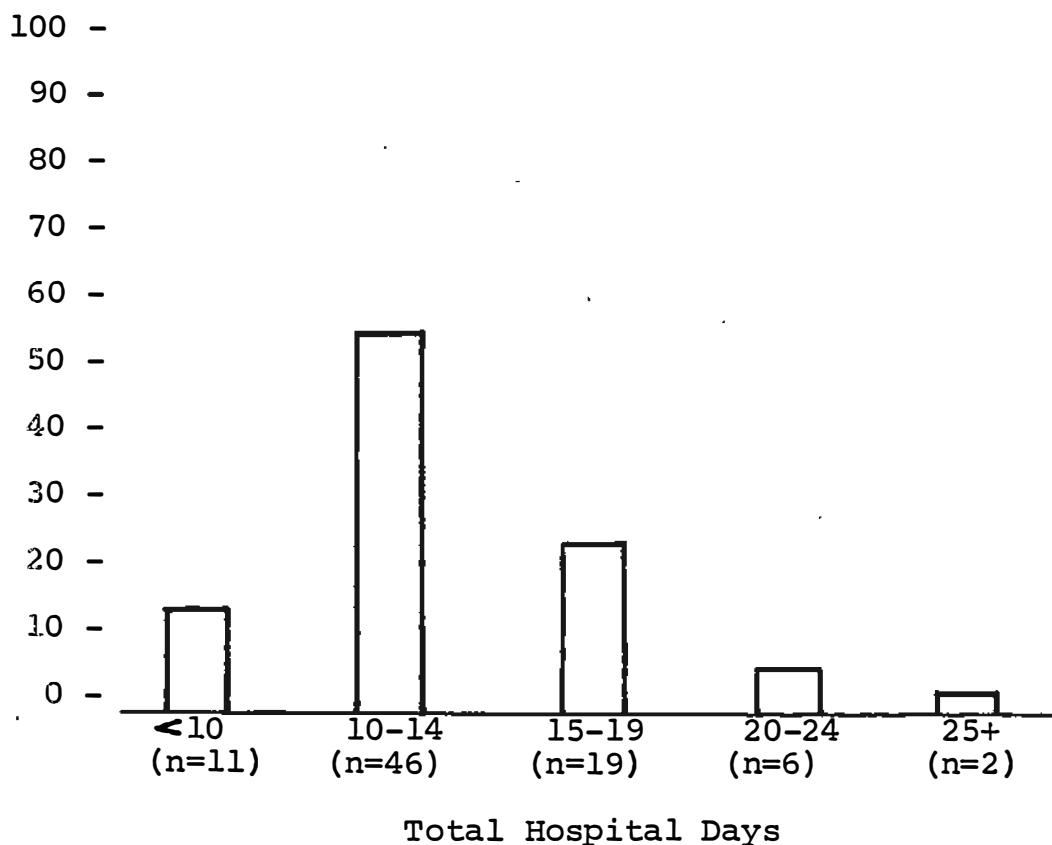


Fig. 8. Distribution of Total Hospital Days.

#### Psychological Variables

The psychological variables measured for this study were anxiety, depression, and denial.

##### Anxiety

Anxiety was measured by the anxiety scale of the Multiple Affect Adjective Checklist (MAACL). Anxiety scores on this scale may range from zero to twenty-one. The mean anxiety score for the myocardial infarction sample was  $7.35 \pm 4.41$  SD. This is compared in Table 17 with normative

data (Zuckerman and Lubin 1965) available for the scale. It can be seen that mean anxiety for the infarction patients was slightly higher than the mean scores for normal, well groups of college students and job applicants, while it was lower than the mean scores of a psychiatric patient.

TABLE 17

MAACL ANXIETY SCALE MEANS AND STANDARD DEVIATIONS OF  
NORMAL AND PATIENT SAMPLES

Sample	N	Mean	S.D.
*Myocardial Infarction Patients	83	7.35	4.41
Job Applications	200	6.25	3.55
College Students	75	6.60	3.65
Psychiatric Patients I	69	10.7	4.90
Psychiatric Patients II	64	8.45	5.00
Pre-Surgical Patients (Lowery 1975)	91	10.3	4.1
*Study Sample			

Table 18 displays additional descriptive statistics for the anxiety variable for which a mean of 7.35 + 4.41 SD was obtained.

TABLE 18

## DESCRIPTIVE STATISTICS FOR MAACL-ANXIETY\*

Mean	Median	Mode	S.D.	Range
7.35	7.67	8.00	4.41	18.00

\*N=83

The distribution of anxiety levels in the study sample is shown in Figure 9. The anxiety distribution was normal as determined by the K-S statistic .832,  $p = .493$ .

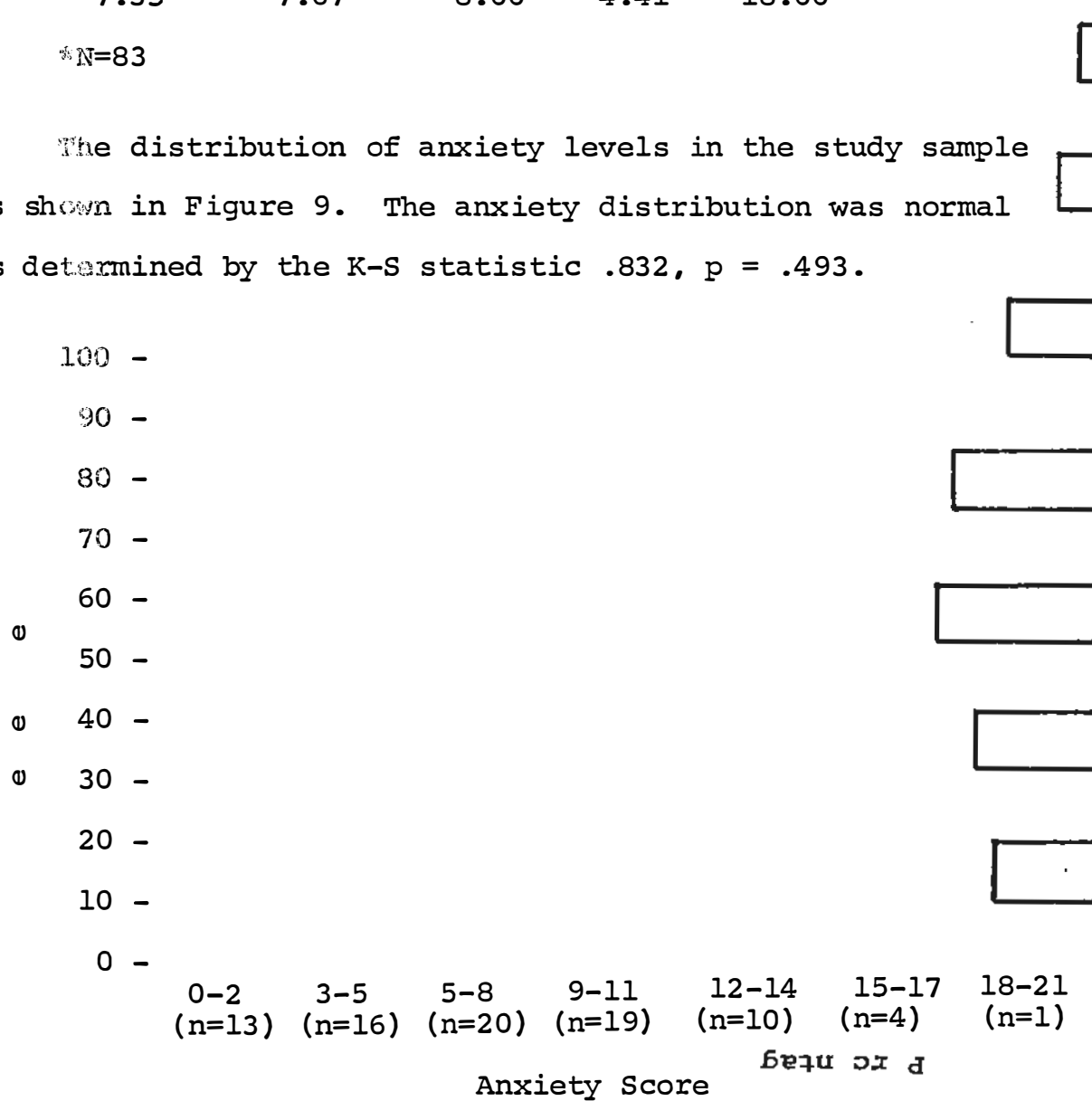


Fig. 9. Distribution of Anxiety Scores.

Depression

Depression was measured by the depression scale of the MAACL (Zuckerman and Lubin 1965), for which values could range from zero to forty. As seen in Table 19, the mean depression score for the study sample was 14.54 + 6.54 SD.

TABLE 19

## DESCRIPTIVE STATISTICS FOR MAACL-DEPRESSION\*

Mean	Median	Mode	S.D.	Range
14.54	15.40	16.00	6.54	31

\*N=83

In Table 20 the mean depression score for myocardial infarction patients is compared with other available normative data (Zuckerman and Lubin 1965). The level of mean depression for myocardial infarction patients was the same or lower than for college students and psychiatric patients, and was considerably higher than for job applicants.

TABLE 20

MAACL DEPRESSION SCALE MEANS AND S.D's OF  
NORMAL AND PATIENT SAMPLES

Sample	N	Mean	S.D.
Myocardial Infarction Patients	83	14.54	6.34
Job Applicants	200	10.55	5.35
College Students	75	14.15	7.15
Psychiatric Patients I	69	18.2	9.35
Psychiatric Patients II	64	15.1	8.35

The distribution of depression scores for the patient sample is graphed in Figure 10 where it is seen to be normally distributed (K-S statistic .733,  $p = .665$ ).

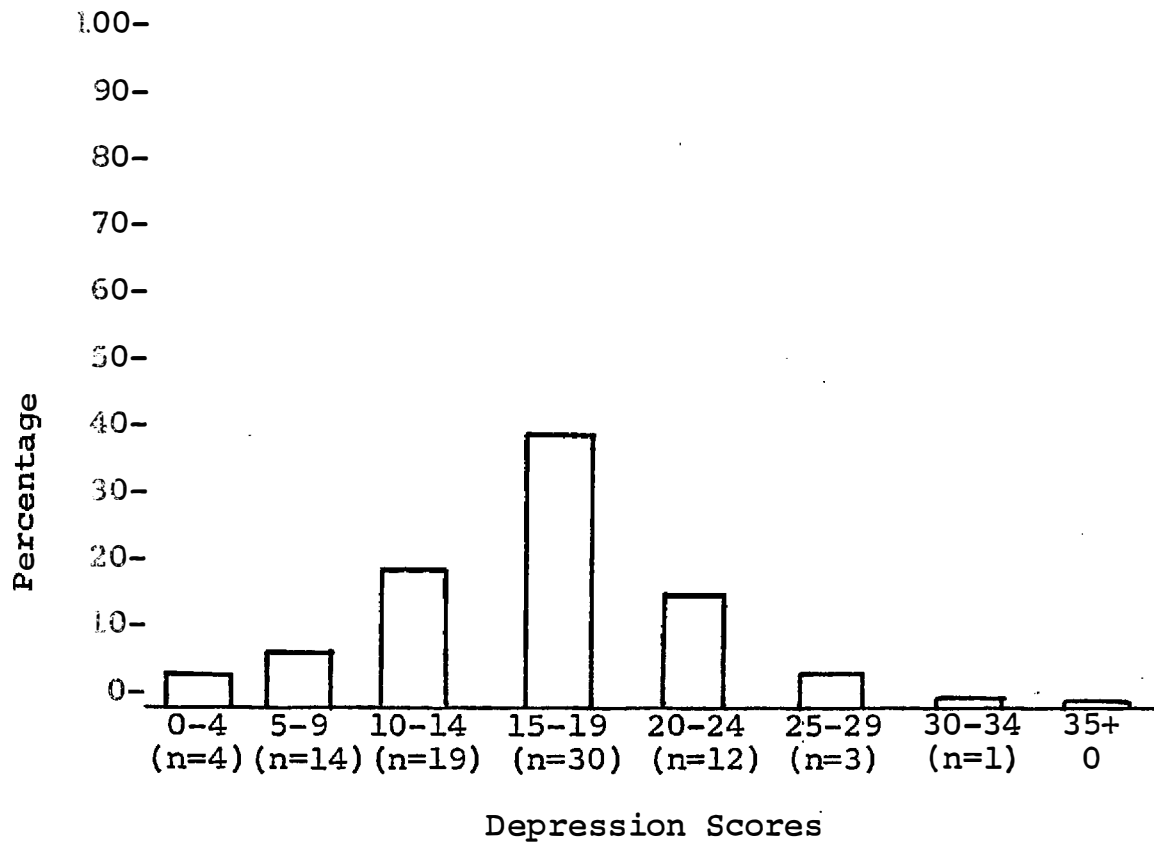


Fig. 10. Distribution of Depression Scores.

### Denial

Denial was defined in two ways for this study. Denial I determined whether a patient admitted to having an infarction, while denial II determined whether a patient admitted to the meaning of the event.

Eighty patients or 96% of the sample admitted they had experienced an infarction. No patient denied the occurrence of infarction and only three patients said they were not sure (see Table 21). This measure of denial was not used in subsequent analyses due to its limited variability.



TABLE 21

## DENIAL I DISTRIBUTION OF SAMPLE

Denial Status	N	Percent
I had a heart attack	80	96%
I did <u>not</u> have a heart attack	0	0
I am not sure whether I had a heart attack	3	4%
*N=83		

There were six items on the Attitude Questionnaire (Item 22) which were used as a scale to determine the degree to which a patient admitted to fear, worry, or concern regarding his myocardial infarction. A patient responded to a likert-type scale for each item and received a total score based on his summated responses. The expected values for denial II could range from six to thirty with higher scores indicating a lesser admission of fear or concern (i.e., more denial). The mean score for denial II was  $22.59 \pm 5.52$  SD. The remaining descriptive statistics for denial II are found in Table 22.

TABLE 22

## DESCRIPTIVE STATISTICS FOR DENIAL II\*

Mean	Median	Mode	S.D.	Range
22.59	22.93	30.00	5.52	24.00
N=78				

The distribution of denial II scores (Figure 11) proved to be normal when submitted to the Kolmogorov-Smirnov One-Sample Test. The obtained K-S statistic was .793,  $p = .556$ .

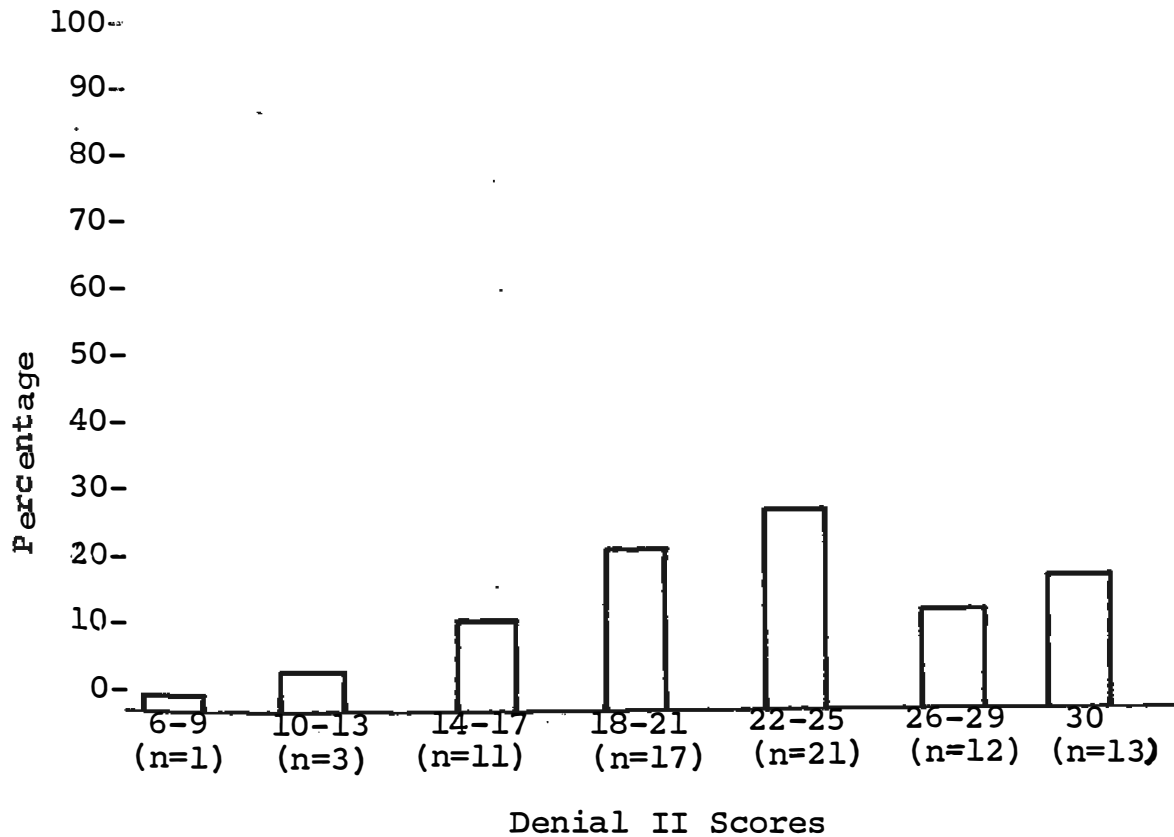


Fig. 11. Distribution of Denial II Scores.

## Cognitive Variables

The cognitive variables for the study were knowledge and information-seeking. Each variable is described below.

Health Knowledge

A 26 item multiple choice test was developed by the investigator and utilized in this study to obtain the data for the knowledge variable. The test, which determined a patient's knowledge regarding myocardial infarction, had a possible range of values from zero to thirty-seven. The mean score for knowledge was 19.64 + 8.07 SD with additional descriptive statistics reported in Table 23. It can be deduced from Table 23 that, on the average, only about 54% of the test items were answered correctly. Figure 12 displays the score distribution for the sample which was normal with a K-S statistic of .986,  $p = .285$ .

TABLE 23

## DESCRIPTIVE STATISTICS FOR KNOWLEDGE\*

Mean	Median	Mode	S.D.	Range
19.64	21.00	26.00	8.07	35.00

\*N=83

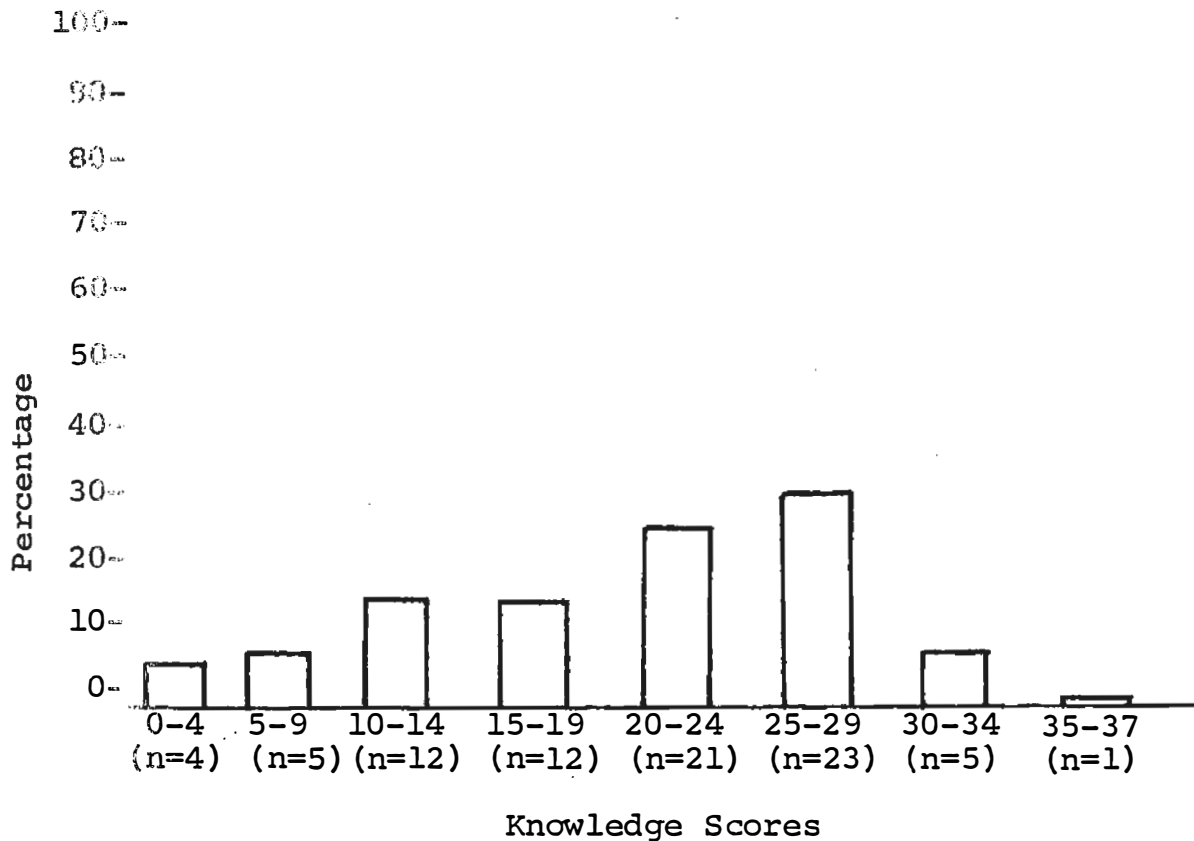


Fig. 12. Distribution of Knowledge Scores

Another section of the knowledge test, Item 27, asked a patient to list the medications he was taking as well as their purpose, side-effect, and timing. This item was not scored as part of the knowledge test because of the tremendous variability in the number of medications taken by the study patients. It is of interest to note, however, that 61% of the sample had no knowledge of their medications.

### Information-Seeking

Information-seeking was defined and measured in two ways for this study. Information I was defined as the

amount of information a patient had obtained from the physician or nurse regarding five specific areas of care. Although an individual nurse's or physician's pattern of giving information to a patient could be expected to vary from situation to situation, it was expected that a patient's information-seeking behavior would ultimately be reflected in the Information-Seeking I scores for the sample. The range of possible values for Information I was zero to five. The sample mean was 1.91 + 1.38 SD with a range of 5.00. These and other descriptive statistics are found in Table 24.

The bimodal nature of the sample distribution is reflected in Figure 13. The computed K-S statistic of 1.586,  $p = .013$ , indicated that information-seeking scores were not normally distributed.

TABLE 24

## DESCRIPTIVE STATISTICS FOR INFORMATION I\*

Mean	Median	Mode	S.D.	Range
1.91	1.88	3.00	1.38	5.00

\*N=84

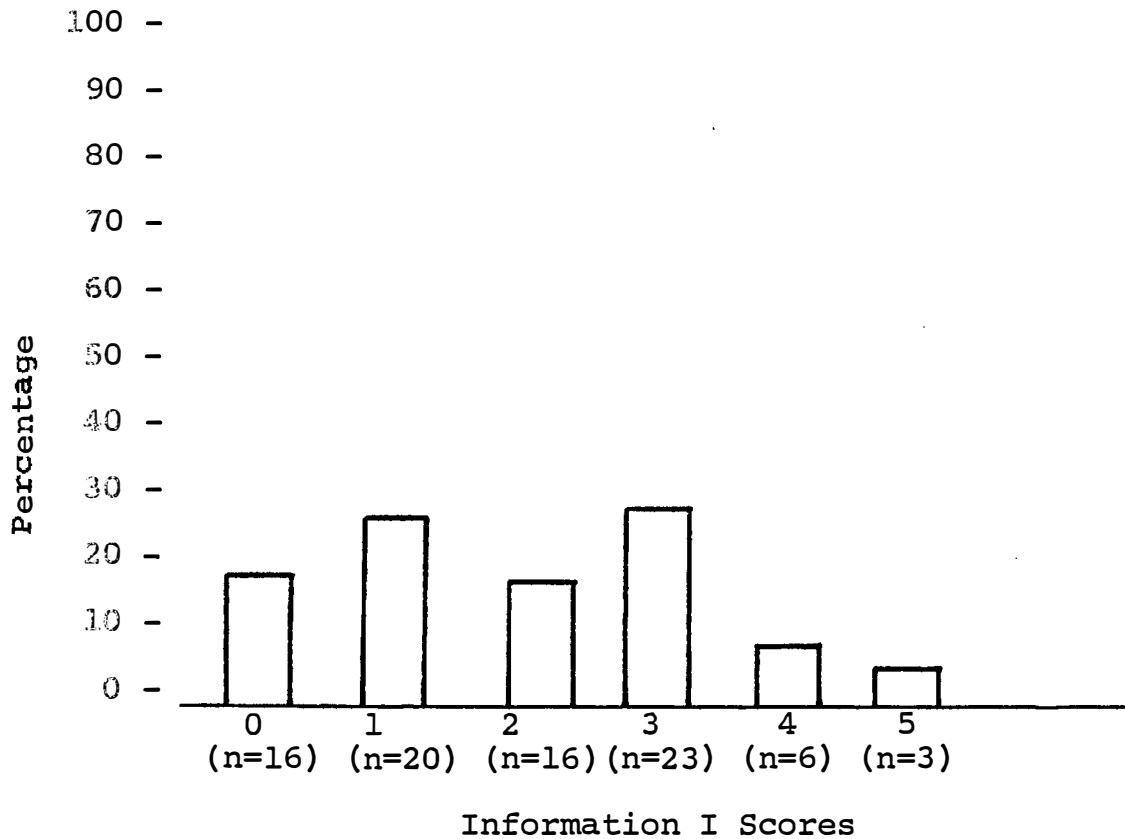


Fig. 13. Distribution of Information I Scores.

Information II was concerned with a specific determination of items or categories about which a patient desired additional information. A high score for Information II indicated a greater desire for information while a low score indicated the opposite. The possible range of values was zero to twelve. Table 25 shows the sample mean for this variable to be  $4.45 \pm 2.83$  SD. The sample distribution in Figure 14 (K-S statistic 1.178,  $p = .125$ ) reflects the sample's low desire for specific information.

TABLE 25

## DESCRIPTIVE STATISTICS FOR INFORMATION II\*

Mean	Median	Mode	S.D.	Range
4.45	4.54	3.00	2.83	9.00
*N=83				

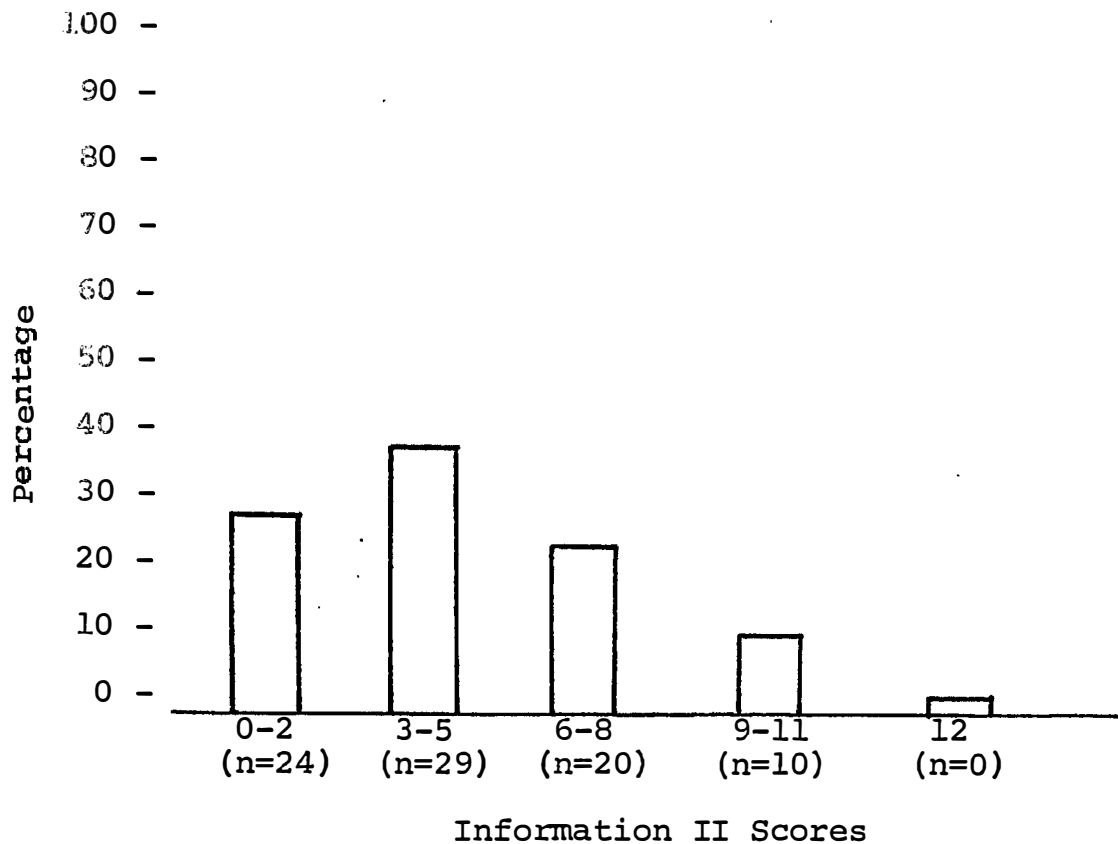


Fig. 14. Distribution of Information II Scores.

## Attitude Variable

The attitude variable for this study was self-perception of health status. The variable score was determined by the patient's view of the severity of his myocardial infarction, his present state of health, the outcome of his recovery,

and his risk of a future infarction. The possible range of values for perceived health status was three to twenty with higher scores indicating a more negative perception of health status. Table 26 displays the descriptive statistics for the sample for which the mean was  $9.56 \pm 2.97$  SD. The sample distribution is seen in Figure 15 and when tested by the K-S statistic was found to be normal (K-S statistic 1.013,  $p = .256$ ).

TABLE 26

DESCRIPTIVE STATISTICS FOR PERCEPTION  
OF HEALTH STATUS\*

Mean	Median	Mode	S.D.	Range
9.56	9.38	11.00	2.97	11.00

\*N=80



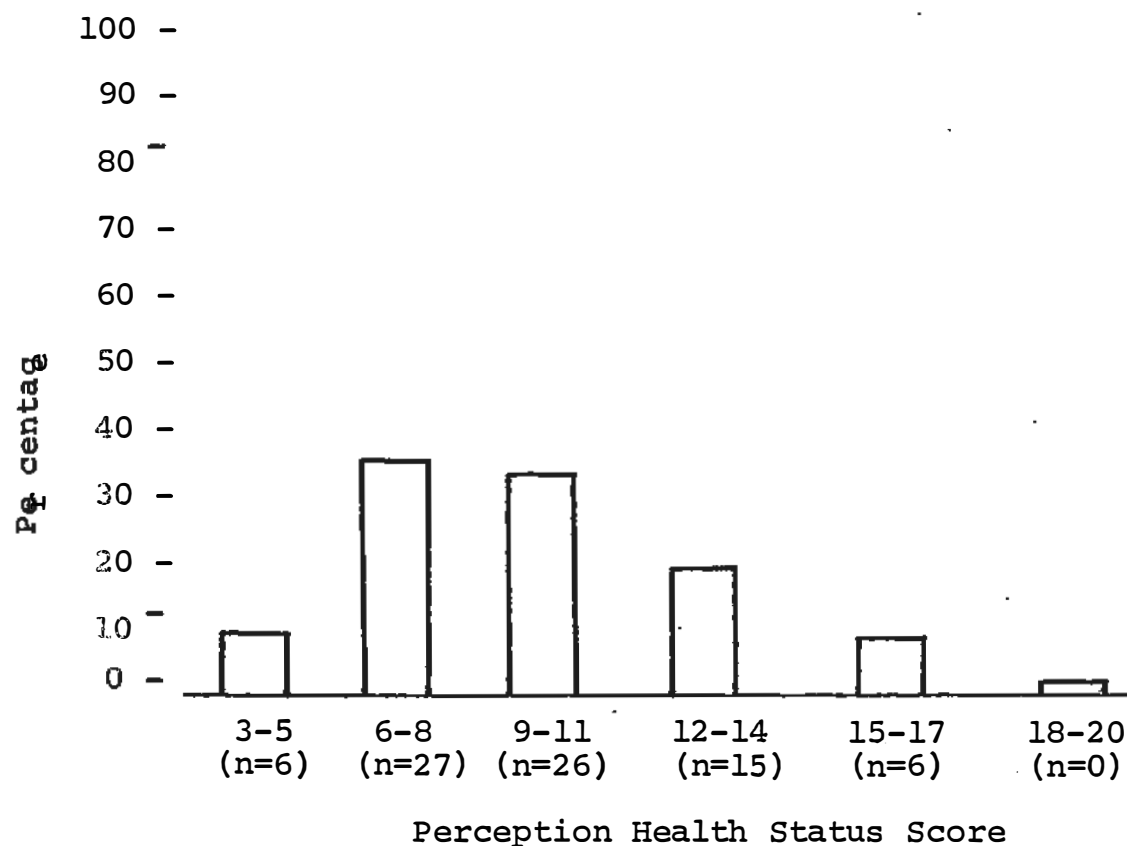


Fig. 15. Distribution of Perception of Health Status Scores.

### Tests of Hypotheses

#### Hypothesis 1

There is no significant relationship between locus of control and selected psychological, cognitive, attitudinal, recovery, physiological, sociological, and demographic variables.

To test hypothesis 1, Pearson product-moment and Eta correlation coefficients were computed between the locus of control variable, measured by the Rotter Internal-External Scale, and each of the other study variables. These correlation coefficients are presented in Table 27 where it can

be seen that locus of control correlated negatively with both health knowledge and education so that higher scores for health knowledge and education tended to be associated with greater internality. Health knowledge and education were statistically unrelated in this sample ( $r=.1934$ ).

Based on the findings, the null hypothesis was rejected and it was concluded that there was a significant relationship between locus of control and the two study variables health knowledge and education.

TABLE 27

CORRELATION COEFFICIENTS FOR LOCUS OF CONTROL  
WITH STUDY VARIABLES

Classification	Variable	N	Pearson r	Eta
<u>Psychological</u>	Anxiety	83	.0991	
	Depression	83	.0110	
	Denial II	77	-.1794	
<u>Cognitive</u>	Health Knowledge	83	-.3494**	
	Information-Seeking I	83	.0437	
	Information-Seeking II	83	-.0727	
<u>Attitudinal</u>	Perceived Health Status	80	.0709	

TABLE 27 (Continued)

Classification	Variable	N	Pearson r	Eta
<u>Recovery</u>	Incidence of Arrhythmia	83	.0536	
	Incidence of Pain	83	.1427	
	Days in CCU	83	-.1199	
	Days in Hospital	83	-.1587	
<u>Physiological</u>	Prior Health Status	83		.0900
	Prior Cardiac Severity of Attack	83	.0369	
		83	-.0402	
<u>Sociological</u>	Family Structure	83		.1400
	Social Status	83		.2700
<u>Demographic</u>	Age	83	-.0339	
	Sex	83	.1339	
	Education	83	-.2572*	

\*Significant at .05 level

\*\*Significant at .01 level

### Hypothesis 2

There is no significant relationship between health locus of control and selected psychological, cognitive, attitudinal, recovery, physiological, sociological, and demographic variables.

Hypothesis 2 was also tested by use of Pearson product-moment and Eta correlation coefficients which are presented in Table 28. No significant relationship was documented between health locus of control and study variables. Therefore, the null hypothesis was accepted as stated.

TABLE 28

CORRELATION COEFFICIENTS FOR HEALTH LOCUS OF  
CONTROL WITH STUDY VARIABLES

Classification	Variable	N	Pearson r	Eta
<u>Psychological</u>	Anxiety	83	.0054	
	Depression	83	.0580	
	Denial II	78	-.1092	
<u>Cognitive</u>	Health Know- ledge	83	-.1484	
	Information- Seeking I	84	.1288	
	Information- Seeking II	83	-.0388	
<u>Attitudinal</u>	Perceived Health Status	80	.0394	
<u>Recovery</u>	Incidence of Arrhythmia	84	.0779	
	Incidence of Pain	84	-.0691	
	Days in CCU	84	-.0899	
	Days in Hospital	84	-.1069	
<u>Physiological</u>	Prior Health Status	84		.2200
	Prior Cardiac Status	84	.1526	
	Severity of Attack	84	-.0567	
<u>Sociological</u>	Family Struc- ture	84		.2600
	Social Status	84		.2000
<u>Demographic</u>	Age	84	.0386	
	Sex	84	-.0698	
	Education	84	-.0200	

## Hypothesis 3

There is no significant relationship between Health Value and selected psychological, cognitive, attitudinal, recovery, physiological, sociological, and demographic variables.

As with the preceding hypotheses, Pearson and Eta correlation coefficients were generated between health value and other study variables. The results, displayed in Table 29, indicate that health value was significantly correlated with incidence of pain so that as health value increased, the incidence of cardiac pain experienced after the first twenty-four hours was decreased. Severity of attack, a variable which might be expected to be related to incidence of pain, was not found to correlate significantly with either health value ( $r=.0858$ ) or incidence of pain ( $r=.1456$ ). The null hypothesis was rejected and it was concluded that health value was significantly related to incidence of cardiac pain.

TABLE 29

CORRELATION COEFFICIENTS FOR HEALTH VALUE  
WITH STUDY VARIABLES

Classification	Variable	N	Pearson r	Eta
<u>Psychological</u>	Anxiety	83	.0411	
	Depression	83	.0959	
	Denial II	78	.0007	

TABLE 29 (Continued)

Classification	Variable	N	Pearson r	Eta
<u>Cognitive</u>	Health Knowledge	83	.1435	
	Information-Seeking I	83	.1178	
	Information-Seeking II	83	.0786	
<u>Attitudinal</u>	Perceived Health Status	80	.1103	
<u>Recovery</u>	Incidence of Arrhythmia	83	.1198	
	Incidence of Pain	83	.2935**	
	Days in CCU	83	-.1368	
	Days in Hospital	83	.1706	
<u>Physiological</u>	Prior Health Status	83		.1300
	Prior Cardiac Status	83	-.1646	
	Severity of Attack	83	.0858	
<u>Sociological</u>	Family Structure	83		.0700
	Social Status	83		.2700
<u>Demographic</u>	Age	83	-.0132	
	Sex	83	.1376	
	Education	83	.1397	

\*\*Significant at .01 level

#### Hypothesis 4

There is no significant relationship between perception of psychological situation and selected psychological, cognitive, attitudinal, recovery, physiological, sociological, and demographic variables.

Hypothesis 4 was also tested by use of Pearson and Eta correlation coefficients. Perception of the psychological situation (recovery from myocardial infarction) was found to be significantly positively correlated with anxiety and depression, perceived health status, and sex (see Table 30).

Because of intercorrelations which existed between anxiety, depression, denial II and perceived health status, partial correlations were computed to determine the direct relationship of the variable to perception of the situation. Anxiety, depression, and perceived health status were each found to have a non-significant relation to the situation when denial II was partialled out.

The only variables which continued to be significantly related to perception of situation were denial II and sex. A skill-controlled view of recovery was associated with high levels of denial and being male while a chance-controlled view was associated with less denial and being female.

The null hypothesis was rejected, and it was concluded that perception of the psychological situation was significantly related to denial II and sex.

TABLE 30

CORRELATION COEFFICIENTS FOR PERCEPTION  
OF SITUATION WITH STUDY VARIABLES

Classification	Variable	N	Pearson r	Eta
<u>Psychological</u>	Anxiety	80	.2745**	
	Depression	80	.2708*	
	Denial II	78	-.2846**	
<u>Cognitive</u>	Health Know- ledge	80	-.0693	
	Information- Seeking I	81	.0811	
	Information- Seeking II	81	.0026	
<u>Attitudinal</u>	Perceived Health Status	78	.2386*	
<u>Recovery</u>	Incidence of Arrhythmia	81	-.0685	
	Incidence of Pain	81	-.0301	
	Days in CCU	81	.0717	
	Days in Hospital	81	-.0109	
<u>Physiological</u>	Prior Health Status	81		.2160
	Prior Cardiac Status	81	-.1517	
	Severity of Attack	81	-.1177	
<u>Sociological</u>	Family Structure	81		.1749
	Social Status	81		.2561
<u>Demographic</u>	Age	81	-.0691	
	Sex	81	.2812**	
	Education	81	.0722	

\*Significant at .05 level

\*\*Significant at .01 level



## Hypothesis 5

There is no significant relationship between situation-locus of control congruency/incongruency and selected psychological, cognitive, attitudinal, recovery, physiological, sociological, and demographic variables.

Pearson and Eta correlation coefficients were used in the test of Hypothesis 5. As seen in Table 31, sex and social status were found to correlate with the congruency/incongruency rating. A negative correlation with sex indicated that being male was associated with an incongruency between locus of control and perception of situation, while being female was associated with a congruency between locus of control and perception of situation. A positive correlation with social status resulted in a higher social status being associated with a tendency toward congruency, while a lower social status was associated with incongruency. The null hypothesis was rejected and it was concluded that situation-locus of control congruency/incongruency was significantly related to social status and sex.

TABLE 31

CORRELATION COEFFICIENTS FOR SITUATION-LOCUS OF  
CONTROL CONGRUENCY/INCONGRUENCY  
WITH STUDY VARIABLES

Classification	Variable	N	Pearson r	Eta
<u>Psychological</u>	Anxiety	81	-.0210	
	Depression	81	-.0384	
	Denial II	78	.1178	

TABLE 31 (Continued)

Classification	Variable	N	Pearson r	Eta
<u>Cognitive</u>	Health Knowledge	81	.0403	
	Information-Seeking I	81	-.0554	
	Information-Seeking II	81	.0207	
<u>Attitudinal</u>	Perceived Health Status	80	.0521	
<u>Recovery</u>	Incidence of Arrhythmia	81	.1990	
	Incidence of Pain	81	-.0165	
	Days in CCU	81	.0842	
	Days in Hospital	81	.0803	
<u>Physiological</u>	Prior Health Status	81		.1058
	Prior Cardiac Status	81	.0649	
	Severity of Attack	81	-.1414	
<u>Sociological</u>	Family Structure			.0635
	Social Status			.2976*
<u>Demographic</u>	Age	81	-.0520	
	Sex	81	-.2438*	
	Education	81	-.1033	

---

\*Significant at .05 level

#### Hypothesis 6

There is no significant relationship between locus of control, health locus of control, health value, and perception of psychological situation.

The presence of significant relationships was determined by testing for the significance of Pearson correlation coefficients. Table 32 displays the correlation matrix generated to test this hypothesis. It is evident that locus of control is positively correlated with health locus of control and perception of the recovery situation.

The relationship between locus of control and health locus of control is such that more external scores on one variable are also associated with more external scores on the second variable. Also, internal scores are associated in the same way. The positive relationship between locus of control and perception of the recovery situation can be interpreted to mean that more external scores for locus of control are associated with a tendency to view the recovery situation as more chance-controlled. Also, internal scores are associated with a perception of recovery as more skill-controlled.

Based on the findings presented in the correlation matrix, the null hypothesis was rejected and it was concluded that there was significant relationship between the social learning theory variables.

TABLE 32

PEARSONIAN CORRELATION COEFFICIENT MATRIX OF  
SOCIAL LEARNING THEORY VARIABLES

Variable	X <sub>2</sub>	X <sub>3</sub>	X <sub>4</sub>
Locus of Control (X <sub>1</sub> )	.4733**	-.1378	.2717*
Health Locus (X <sub>2</sub> )		-.0064	.0582
Health Value (X <sub>3</sub> )			-.2023
Perception of Situation (X <sub>4</sub> )			

\*Significant at .05 level  
\*\*Significant at .01 level

### Hypothesis 7

There is no significant predictive relationship between each of the following dependent variables and the social learning theory variables (locus of control, health locus of control, perception of situation, health value, congruency/incongruency) when multilinear regression models are built: anxiety, depression, denial, health knowledge, information-seeking, perceived health status, incidence of arrhythmia, incidence of pain, days in CCU, and total days in hospital.

Hypothesis 7 was tested using forward stepwise multiple regression models for which the  $R^2$  for an equation was tested at the .05 level of significance. Only those social learning variables which resulted in a significant  $R^2$  were allowed to enter the regression equation.

Anxiety

Only two variables, perception of the recovery situation and health locus of control, entered the regression equation before a non-significant F statistic was obtained (see Table 33).

TABLE 33

ANOVA SUMMARY TABLE FOR SIGNIFICANT  
REGRESSION ON ANXIETY

Source	Df	SS	MS	F
Regression	2	131.14	65.57	3.75*
Residual	71	1240.70	17.47	

\*Significant at .05 level

It can be seen in Table 34 that perception of the recovery situation was the most significant predictor of anxiety as demonstrated by its significant beta weight. It is important to point out, however, that perception of the situation was significantly related to denial II, and that when denial II was partialled out of the relationship of the recovery situation and anxiety, the degree of their correlation was reduced.

Both social learning variables, perception of the recovery situation and health locus of control, accounted for

approximately 10% of the variance in anxiety level. Locus of control, health value, and congruency/incongruency did not enter the equation.

TABLE 34

## REGRESSION SUMMARY TABLE FOR ANXIETY

Variables in Equation	Beta	F	Multiple R	R <sup>2</sup>
Perception of Situation	.3059	7.33**	.3030	.0920
Health Locus	-.0618	.30	.3092	.0956

Depression

Three variables, perception of the recovery situation, health value, and locus of control, entered the regression equation on depression. The test of  $R^2$  is displayed in Table 35.

TABLE 35

ANOVA SUMMARY TABLE FOR SIGNIFICANT  
REGRESSION ON DEPRESSION

Source	Df	SS	MS	F
Regression	3	365.79	121.93	3.01*
Residual	70	2831.36	40.45	

\*Significant at .05 level

As with the regression on anxiety, perception of the recovery situation was the only predictor variable with a significant beta weight. A partial correlation between perception of the recovery situation and depression with denial II held constant, however, resulted in a reduction of the relationship.

The variables displayed in Table 36 explained approximately 12% of the variance found in depression. Health locus of control and congruency/incongruency did not enter the regression equation.

TABLE 36

## REGRESSIONSUMMARY TABLE FOR DEPRESSION

Variables in Equation	Beta	F	Multiple R	R <sup>2</sup>
Perception of Situation	.3526	8.90**	.3082	.0950
Health Value	.1015	.76	.3281	.1076
Locus of Control-	.0364	.54	.3383	.1144
**Significant at .01 level				

Denial

The social learning variables were regressed on denial (denial II) which was defined as the repudiation of the meaning of the myocardial infarction. The results of the F test of the significance of  $R^2$  for the four variables which entered the equation are displayed in Table 37.



TABLE 37

ANOVA SUMMARY TABLE FOR SIGNIFICANT  
REGRESSION ON DENIAL

Source	df	SS	MS	F
Regression	4	292.75	73.19	2.49*
Residual	69	2023.87	29.33	

\*Significant at .05 level

As with the other psychological variables, the perception of the recovery situation was the only variable which achieved a significant beta weight as seen in Table 38. Also, in Table 38, it is evident that the perception of the recovery situation, locus of control, congruency, and health value variables accounted for approximately 13% of the variance in denial of the meaning of myocardial infarction. Health locus of control did not enter the equation.

TABLE 38

## REGRESSION SUMMARY TABLE FOR DENIAL

Variables in Equation	Beta	F	Multiple R	R <sup>2</sup>
Perception of Situation	-.2547	4.43*	.2911	.0847
Locus of Control	-.1719	1.51	.3110	.0968
Congruency/ Incongruency	.1563	1.65	.3410	.1163
Health Value	-.1027	0.76	.3555	.1264

\*Significant at .05 level

Health Knowledge

When the social learning variables were regressed on knowledge of the myocardial infarction and its consequences, four variables entered the prediction equation to produce a significant  $R^2$  (see Table 39). Table 40 reflects the approximately 14% explained variance of health knowledge contributed by locus of control, health value, congruency/incongruency, and perception of the recovery situation variables. Health locus of control did not enter the equation.

TABLE 39

ANOVA SUMMARY TABLE FOR SIGNIFICANT  
REGRESSION ON HEALTH KNOWLEDGE

Source	df	SS	MS	F
Regression	4	647.40	161.85	2.69*
Residual	69	4146.55	60.09	

\*Significant at .05 level

TABLE 40

## REGRESSION SUMMARY TABLE FOR HEALTH KNOWLEDGE

Variable in Equation	Beta	F	Multiple R	$R^2$
Locus of Control	-.3518	7.86**	.3382	.1144
Health Value	.1238	1.13	.3580	.1281
Congruency/ Incongruency	.0744	.38	.3631	.1318
Perception of Situation	.0606	.26	.3675	.135.

\*\*Significant at .01 level

### Information-Seeking

There were two measures of information-seeking used in this study. Information I pertained to the amount of information obtained from professional staff regarding specific areas of care. Information II was concerned with a specific determination of the number of items about which more information was desired. A significant regression equation was not obtained for either measure of the dependent variable when using the social learning variables as predictors.

### Perception of Health Status

A patient's perception during early convalescence of his health status was utilized as a dependent variable for the regression of the social learning variables. Perception of the recovery situation, health value, and congruency/incongruency were the three social learning variables which were in the final significant regression equation (see Table 41).

TABLE 41

ANOVA SUMMARY TABLE FOR SIGNIFICANT  
REGRESSION ON HEALTH STATUS

Source	df	SS	MS	F
Regression	3	85.12	28.37	3.36*
Residual	70	590.89	8.44	

\*Significant at .05 level

As seen in Table 42, the beta weight for perception of the recovery situation was significant. As with anxiety and depression earlier, however, a partial correlation between perception of health status and perception of the recovery situation with denial II held constant resulted in a reduction of the correlation between the two variables.

Approximately 13% of the variance in perception of health status was explained by the regression equation. Locus of control and health locus of control did not enter the equation.

TABLE 42

## REGRESSION SUMMARY TABLE FOR HEALTH STATUS

Variables in Equation	Beta	F	Multiple R	R <sup>2</sup>
Perception of Situation	.3216	7.83**	.2670	.0713
Health Value	.2004	3.06	.3310	.1096
Congruency/Incongruency	.1283	1.31	.3546	.1260
*Significant at .01 level				

Incidence of Arrhythmia

A regression of the social learning variables on incidence of arrhythmia did not result in any significant prediction.

Incidence of Pain

Two social learning variables predicted significantly to incidence of cardiac pain as indicated by the ANOVA summary in Table 43. Health value and locus of control together explained approximately 9% of the variance in incidence of cardiac pain as seen in Table 44. Health locus of control, perception of the recovery situation, and congruency/incongruency did not enter the regression equation.

TABLE 43

ANOVA SUMMARY TABLE FOR SIGNIFICANT  
REGRESSION ON PAIN

Source	df	SS	MS	F
Regression	2	1.46	.73	3.26*
Residual	71	15.94	.22	

\*Significant at .05 level

TABLE 44

## REGRESSION SUMMARY TABLE FOR PAIN

Variables in Equation	Beta	F	Multiple R	R <sup>2</sup>
Health Value	.2525	4.74*	.2731	.0746
Locus of Control	-.0999	.74	.2901	.0842

\*Significant at .05 level

Days in CCU

A regression of the social learning variables on days spent in CCU did not result in any significant prediction.

Days in Hospital

A regression of the social learning variables on total days spent in the hospital did not result in any significant prediction.

Based upon the results of the multiple regression analyses, Hypothesis 7 was rejected and it was concluded that

there was a significant predictive relationship between the social learning theory variables and anxiety, depression, denial II, health knowledge, perception of health status, and incidence of cardiac pain.

### Related Findings

In addition to the relationships identified in this study between social learning theory variables and early convalescence behaviors known to affect recovery, other study variables were also found to be related to early convalescence behaviors. These findings are presented in this section.

### Psychological Variables

The psychological behaviors of concern to this study were anxiety, depression, and denial, for each of these has been shown empirically to affect the myocardial infarction patient's recovery.

### Anxiety

Several variables were significantly associated with anxiety as determined by Pearson correlation coefficients. Table 45 displays these variables.

TABLE 45

## SIGNIFICANT PEARSONIAN CORRELATION COEFFICIENTS FOR ANXIETY AND STUDY VARIABLES

Variable	N	r
Age	83	-.2889**
Depression	83	.8014**
Perceived Health Status	79	.3939**
Denial II	77	-.5497**
Pain	83	-.2436*
Perception of Situation	80	.2745*

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\*Significant at .05 level

\*\*Significant at .01 level

Because several of the variables which were significantly related to anxiety were also found to be intercorrelated, partial correlation coefficients were computed in an attempt to clarify the underlying relationships. Two variables which correlated with anxiety, perception of health status and denial II, were significantly correlated with each other ( $r = -.5155$ ,  $p < .01$ ). When denial II was held constant and the relationship between perception of health status and anxiety was re-examined, the correlation was reduced from  $r = .3939$  ( $p < .01$ ) to  $r = .1544$  ns. It appears that perception of health status was not significantly related to anxiety when the confounding effect of denial II was removed.



Perception of the psychological situation, a social learning variable, correlated significantly with anxiety. However, it also correlated significantly with denial II. When denial II was partialled out and the relationship between anxiety and perception of the situation was re-examined, the correlation was reduced from  $r=.2745$  ( $p < .05$ ) to  $r=.1474$  ns. Perception of the situation was not significantly correlated with anxiety when the effects of denial II were held constant.

Pain experienced after the first day of admission correlated with anxiety as well as with denial II. When denial II was held constant, however, the relationship between anxiety and pain was no longer significant ( $r=.0729$  ns).

The significant correlation between anxiety and depression remained when denial II and perception of health status were individually partialled out. Because age was not correlated with any variable which was also correlated with anxiety, its relationship to anxiety was accepted.

As discussed, the initial relationships between anxiety and perception of health status, pain, and perception of the situation became nonsignificant when denial II was controlled. It appears that only age, depression, and denial II resulted in significant direct correlations with anxiety. This can be interpreted to mean that increased anxiety was associated

with younger age, increased depression, and decreased denial II. The opposite was true for decreased anxiety.

### Depression

Because of the higher correlation found between depression and anxiety, it was not unexpected to find that many of the same variables which had been related to anxiety were also related to depression (see Table 46). Due to intercorrelations which existed between some of these variables, partial correlation coefficients were computed so that those variables with a direct relationship to depression could be identified.

As found earlier with anxiety, neither perception of health status ( $r=.1309$ ), perception of the situation ( $r=.1675$ ), nor incidence of pain ( $r=.1123$ ) retained its significant correlation with depression when denial II was partialled out. In addition, the correlation between sex and depression ( $r=.1614$ ) was nonsignificant after denial II was partialled out.

TABLE 46

SIGNIFICANT PEARSONIAN CORRELATION COEFFICIENTS FOR  
DEPRESSION AND STUDY VARIABLES

Variable	N	r
Anxiety	83	.8014**
Denial II	77	-.4468**
Information-Seeking II	82	-.2255*
Pain	83	-.2460*
Perceived Health Status	79	.4012**
Perception of Situation	80	.2108*
Sex	83	.2399*

\*Significant at .05 level

\*\*Significant at .01 level

In summary, the correlations between depression and incidence of pain, perception of health status, perception of the situation, and sex were found to be nonsignificant when denial II was partialled out. Only anxiety, information-seeking II, and denial II retained significant direct correlations with depression. This means that increased depression was associated with increased anxiety, decreased information-seeking, and decreased denial. The opposite of these relationships was true for decreased depression.

Denial II

Denial II proved to be very significantly associated with psychological upset (i.e., anxiety and depression). Many correlations between anxiety, depression, and other variables which were initially significant lost significance when denial II was partialled out of the relationship.

Denial II was related to the variables displayed in Table 47. It can be seen that denial II correlated positively with incidence of pain, and negatively with the remaining variables. This can be interpreted to mean that as denial II increased it was associated with a lesser incidence of pain; lesser degree of anxiety, depression, and information-seeking; better perception of health status; and a view of recovery as being skilled-controlled. Finally, being male was associated with increased denial II.

Partial correlation analysis with appropriate variables did little to alter existing relationships. In fact, no correlation between denial II and other variables lost significance during partial correlation.

TABLE 47

SIGNIFICANT PEARSONIAN CORRELATION COEFFICIENTS FOR  
DENIAL II AND STUDY VARIABLES

Variable	n	r
Anxiety	83	-.5497**
Depression	77	-.4468**
Information-Seeking II	82	-.2288*
Pain	83	.3390**
Perceived Health Status	79	-.5155**
Perception of Situation	80	-.2846**
Sex	83	-.2217*

\*Significant at .05 level

\*\*Significant at .01 level

#### Cognitive Variables

There were two cognitive variables used for this study--health knowledge and information-seeking. Significant relationships between the cognitive and other variables are identified below.

#### Health Knowledge

Knowledge regarding myocardial infarction and required changes in life style was significantly associated with the variables in Table 48. It is evident that knowledge of the specific health situation was positively related to information-seeking, and negatively related to age, locus of

control, and sex. The negative relationship can be interpreted to mean that increased knowledge was associated with being younger, male, and internal. The opposite was true that decreased knowledge was associated with being older, female, and external.

TABLE 48

SIGNIFICANT PEARSONIAN CORRELATION COEFFICIENTS FOR  
HEALTH KNOWLEDGE AND STUDY VARIABLES

Variable	n	r
Age	83	-.2948**
Information-Seeking I	83	.2445*
Locus of Control	83	-.3494**
Sex	83	-.2804*

\*Significant at .05 level

\*\*Significant at .01 level

#### Information-Seeking

Information-seeking I was positively associated with health knowledge ( $r=.2445$ ,  $p .05$ ). Information-seeking II was negatively associated with severity of attack, depression, and denial II (see Table 49).

TABLE 49

SIGNIFICANT PEARSONIAN CORRELATION COEFFICIENTS FOR  
INFORMATION-SEEKING II AND STUDY VARIABLES

Variable	n	r
Denial II	78	-.2288*
Depression	82	-.2255*
Severity of Attack	83	-.2871**

\*Significant at .05 level

\*\*Significant at .01 level

A partial correlation computed between information-seeking II and depression with denial II held constant still resulted in a significant relationship. Therefore, increased information-seeking was associated with decreased denial, decreased depression, and a less severe myocardial infarction.

## Attitude Variable

The attitude variable for this study was perception of health status. It can be seen in Table 50 that it correlated significantly with several other variables. Because several of the variables with which perception of health status correlated were intercorrelated, partial correlations were computed as indicated.

TABLE 50

SIGNIFICANT PEARSONIAN CORRELATION COEFFICIENTS FOR  
PERCEPTION OF HEALTH STATUS AND STUDY VARIABLES

Variable	N	r
Anxiety		.3939**
Depression		.4012**
Denial II		-.5155**
Perception of Situation		.2386*
Prior Cardiac History		-.2160
*Significant at .05 level		
**Significant at .01 level		

On the basis of the partial correlations, anxiety ( $r=.1544$ ), and perception of the situation ( $r=.1119$ ) were found to have nonsignificant correlations with perception of health status when denial II was partialled out. Denial II and prior cardiac history were negatively related to perception of health status so that poor perception of health status was associated with decreased denial and a positive cardiac history. Those patients utilizing increased denial and who had a negative cardiac history tended to perceive their health status as more favorable. Finally, depression correlated positively with perception of health status so that higher depression levels were associated with poorer perceptions of health status and vice-versa.



Summary

This chapter presented a description of the study sample, study variables, <sup>AND</sup> statistical findings related to the hypotheses, and major related findings.

Patient data which were collected in six private hospitals were pooled for subsequent analysis after it was concluded that the data were not artifactual of individual settings. The sample was described by both descriptive statistics and a presentation of the sample distribution on each of the demographic and sociological study variables. The race and marital status variables were deleted after discovery of their limited variance. Descriptive data were also presented for study variables in the following categories: social learning theory, physiological, psychological, cognitive, attitude, and recovery. When appropriate, the distribution of a variable was tested for normality by the Kolmogorov-Smirnov One-Sample Test.

In the next to the last section of the chapter, results of the tests of the study hypotheses were presented. Hypotheses 1, 3, 4, and 5 were rejected and it was concluded that significant relationships did exist between study variables and locus of control, health value, perception of the recovery situation and congruency/incongruency. Hypothesis 6 was also rejected when significant relationships were discovered between locus of control, health locus of control, and perception of the recovery situation. Hypothesis 7 was

rejected when the social learning variables which were used as independent variables predicted significantly to anxiety, depression, denial II, health knowledge, perception of health status, and incidence of pain.

Finally, related findings of the study were presented. Significant associations between study variables and those patient behaviors known to affect recovery were identified.

## CHAPTER V

### INTERPRETATION AND DISCUSSION

#### Introduction

This chapter is concerned with a discussion and interpretation of the findings of the study. The initial section presents a brief overview of the characteristics of the study sample. The second section is a discussion of each of the study hypotheses under investigation. The final section is directed toward a discussion of the related findings.

#### Overview of Sample

Eighty-four myocardial infarction patients comprised the sample for this study. The mean patient age was fifty-five and the sample was predominantly white (94%). The average level of education completed by sample participants was high school, with almost three-fourths of the sample completing a high school or higher education. The large majority of the sample, of which 86% were males and 14% females, were married. Thirty-three percent still had children in the home. Sixty-three percent of the sample was of middle-class or higher social status.

Almost three-fourths of the sample had experienced acute and/or chronic medical problems prior to participation in the study, while only one-third had ever experienced a cardiac problem. Approximately 85% of the patients had experienced their first myocardial infarction. The sample's ratings for severity of infarction tended to be less severe and, in fact, the distribution of severity scores was positively skewed.

### Hypotheses

#### Hypothesis I

The first hypothesis, which proposed that there was no significant relationship between locus of control and selected study variables, was rejected. Locus of control was found to be negatively associated with health knowledge and level of education. Internality was associated with increased knowledge regarding myocardial infarction and with higher levels of education, while externality was associated with decreased levels of health knowledge and education. It is important to note that when education was held constant, the inverse relationship between locus of control and health knowledge remained significant at the .01 level.

The inverse relationship discovered between locus of control and health knowledge supports social learning theory predictions and previous investigational findings

(Rotter, Chance, and Phares 1972; Seeman and Evans 1962; Seeman 1963; Lowery 1974; Wallston, Mardes, and Wallston 1976; Davis and Phares 1967; DuCette and Wolk 1973; Wolk and DuCette 1974; Shapiro 1973; Auerbach et al 1976), and indicates that locus of control is an important indicator of the amount of knowledge a myocardial infarction patient will acquire about his condition.

The inverse relationship between locus of control and education requires comment. No previous studies have reported an examination of the relationship between locus of control and education in the adult. Several studies have, however, reported inverse relationships between social status and locus of control. Although social status was not related to locus of control in this study, it was very significantly related to education (Eta coefficient = .7100,  $P < .001$ ). It is not clear whether the study finding of an association between locus of control and education occurred because of a possible confounding effect of social status, or whether a patient with a higher level of education really tended to be more internal.

It was surprising to find that locus of control was not related to any other variables in this study. Based on social learning theory and previous research findings, it was expected that locus of control would be related to anxiety, depression, and denial. The direction of the

expected relationships was difficult to predict because of the variability which has been found in associations between locus of control and psychological behaviors. This variability has been shown to be related to whether a situation is perceived to be threatening and, also, whether measures of affect are subjective or objective (Joe 1971; Lowery 1974; Phares 1976; Houston 1972; Lipp, Kolstoe and James 1968; Goldstein 1971; Naditch, Gargan, and Michael 1975; Phares, Ritchie, and Davis 1968).

There are several possible explanations of why relationships were not discovered between locus of control and the psychological variables. The instrument used to measure locus of control (Rotter Internal-External Locus of Control Scale) may not have exhibited the same degree of validity when utilized with older subjects in the non-experimental study situation. Also, the fact that locus of control scores tended toward internality may have affected the magnitude of the correlation coefficients which were obtained, as it is known that a homogeneous performance on one measure reduces possible correlations between that measure and others (Anastasi 1976). Additionally, the sample's performance on the anxiety, depression, and denial measures tended to reflect considerable denial, little anxiety and little depression. Perhaps this tendency

toward homogeneity on the psychological measures also acted to reduce correlation coefficients. Finally, an individual's psychological response to myocardial infarction may be such a complex phenomenon that a single variable, locus of control, may not explain much variance.

A last point regarding locus of control deserves consideration. It was surprising to find that this group of myocardial infarction patients tended toward an internal locus of control. This was surprising, because it was expected that most people who had recently experienced a sudden, unexpected, major threat to their existence might feel somewhat out of control. This did not appear to be the case, however. It is not known whether the coronary prone individual might have a tendency toward an internal locus of control in a way which is similar to his tendency toward Type A personality (Jenkins et al 1971). If so, this could mean that many people with atherosclerotic heart disease might be quite internal, with the internality possibly causing or accelerating the atherosclerotic process in some ways.

Another possible interpretation of the sample's tendency toward internality might be that it is the result of an overcompensation by patients who are really feeling out of control in the particular situation. Perhaps a feeling of decreased control results in denial, which in turn

results in the patient's selection of items on the Rotter Internal-External Locus of Control Scale which yield a more internal score. This could mean that the patient does not acknowledge the vulnerability or lack of control he might really be experiencing. Clearly, this tendency of recent myocardial infarction patients toward internality requires further investigation.

### Hypothesis II

Hypothesis II was accepted upon finding no significant relationship between health locus of control and selected study variables. One objective of this study was to determine differences in predictive value between a specific (Health Locus of Control Scale) and a general (Rotter Internal-External Locus of Control Scale) measure of locus of control. It was surprising to find that the more specific measure of locus of control did not result in improved association with study variables. In fact, it resulted in less association than Rotter's more general measure.

The alpha and split-half reliability coefficients of .69 and .74 computed for this study indicated reasonable scale reliability. However, the established validity for the Health Locus of Control Scale was limited, as was discussed in Chapter III. Perhaps the scale does not clearly measure the degree of control a patient feels over his



health state. Or, perhaps, a knowledge of a patient's general health locus of control is not helpful in understanding his response to a specific health situation, such as myocardial infarction.

### Hypothesis III

Although Hypothesis III was rejected upon finding a significant relationship between health value and incidence of pain, the rejection appears to be of limited consequence. It was determined that an increased health value was associated with a lesser incidence of cardiac pain after the first day in the hospital, while a decreased health value was associated with increased pain. No explanation for this relationship is proposed.

The finding that health value was not associated with other study variables may be related to the fact that health value, as measured in this study, referred to how a patient had operationalized his past health value in specific health situations. It may be that the value of health which guided actions in the past is not pertinent to behavioral response during the crisis situation of myocardial infarction.

It was ascertained during the pilot study that each patient ranked health as being of the highest personal value. Because of this, it may not be possible to accurately

differentiate levels of health value during early convalescence, as was attempted for this study.

#### Hypothesis IV

The fourth hypothesis was formulated to determine if a significant relationship existed between perception of the psychological situation and selected study variables. The results of the study indicated there was a positive correlation of perception of the situation with anxiety, depression, perception of health status, and sex, and a negative correlation with denial II. Therefore, the null hypothesis was rejected.

Upon finding intercorrelations between the variables which were related to perception of the situation, partial correlations were computed in an attempt to clarify the underlying relationships between study variables and perception of the situation. When denial II was held constant, the significant relationships between perception of the situation and anxiety, depression, and perception of health status were reduced. The only variables which continued to correlate significantly with perception of the situation were denial II and sex. A skill-controlled view of recovery was associated with greater denial II and being male, while a chance-controlled view of recovery was associated with less denial II and being female.

There are several things which merit discussion regarding the findings for this hypothesis. It was not particularly surprising to find the inverse relationship of denial II with anxiety and with depression. It was not expected, however, that holding denial II constant would significantly diminish the relationships between these psychological variables and perception of the situation. It is not clear why this happened, unless denial II represented a stronger measure of psychological upset than anxiety and depression did.

It is not known whether denial of the psychological meaning of an event can be measured independently of anxiety and/or depression. It may be that increased discriminant validity between measures of psychological upset and measures of denial II, as defined in this study, cannot be achieved.

An understanding of how a patient views his recovery could be extremely important. The patient who views recovery and return to wellness as a process which is skill-controlled may participate more fully in rehabilitation and may, as a result, experience a longer and richer life following infarction (Humphries 1977). On the other hand, the patient who views recovery as chance-controlled, or as a process over which he can have little influence, will

probably not accede to rehabilitation plans and may, therefore, jeopardize his live and well-being. It should be clear that a knowledge of the patient's view of recovery, as well as the factors which may determine or affect that view, would be important to professional nurses who are responsible for assisting the patient during recovery.

In this study, denial II and sex were the two variables which were significantly associated with a patient's perception of the recovery situation. Because of the correlational design of the study there is no bias for a determination of causation between denial II and a patient's view of recovery. Even though it is clear that varying degrees of denial II were associated with different views of recovery, it is impossible to say whether the degree of denial II resulted in a specific view of the situation or whether the view of the situation resulted in the degree of denial II which was manifested. There may be, in fact, other variables responsible for the observed relationship between denial II and perception of the situation which have not yet been documented, such as an underlying personality construct. For example, although locus of control did not correlate significantly with denial II ( $r = -.1794$ ), the relationship was in the expected direction. Locus of control did, however, correlate significantly with perception of the situation ( $r = .2717$ ). Perhaps locus of control,

or some other psychological construct, will be found to account for both degree of denial II and perception of the situation, so that individual differences on these two variables can be seen to result from an underlying personality structure. Whatever the findings from future research, it is important to continue to investigate the relationship between denial and perception of the recovery situation.

When the relationship between perception of the situation and sex is examined it is not clear why males tended to view recovery as more skill-controlled, while females viewed it as more chance-controlled. There were no variables measured in this study which were discovered to confound the relationship between sex and perception of the situation. Perhaps males tend to view situations in general as more skill-controlled because of social conditioning, while females do not (Rotter, Chance, and Phares 1972). Or perhaps, females, aware that myocardial infarctions in the United States tend to occur mainly in males (American Heart Association 1976), may feel "struck down" and as though there is little they can do to control recovery outcomes.

## Hypothesis V

Hypothesis V was rejected upon finding significant relationships between situation-locus of control congruency/incongruency and social status and sex. This indicates that being male was associated with incongruency between perception of the situation and locus of control, while being female was associated with situation-locus of control congruency. Also, a higher social status was associated with congruency of situation-locus of control, while a lower social status was associated with incongruency. These findings are very difficult to interpret, particularly in light of other study findings.

It will be recalled that the results of the test of Hypothesis IV indicated that being male was associated with a perception of the recovery situation which was skill-controlled (i.e., internal), while being female was associated with a chance-controlled perception (i.e., external). It would seem that for maleness to be associated with incongruency of situation-locus of control (i.e., internal situation-external locus of control or external situation-internal locus of control) as was found for Hypothesis V, being male would also have to be significantly related to an external locus of control. Then, maleness would be associated with an internal situation and an external locus of control (i.e., incongruency). Exactly the opposite

would be expected for females. However, not only was sex not significantly associated with locus of control, the relationship was not in the expected inverse direction. This investigator proposes no explanation for this finding. Perhaps, future investigation can clarify the relationships.

It is surprising that the congruency/incongruency variable was not associated with additional study variables. It was expected that congruency/incongruency might correlate positively with anxiety and depression, and negatively with health knowledge and information-seeking (Watson and Baumal 1967; Rotter and Mulry 1965; Lipp, Kolstoe and James 1968). It would seem that an internal patient who finds himself in a situation over which he believes himself to have limited control would experience greater psychological upset than if he believed he could control the relationship between behavior and reinforcement as he is used to doing. The opposite would also be anticipated for the external patient who views the recovery situation as skill-controlled. There is no ready explanation for the failure to support this hypothesis. Perhaps during early convalescence, which was the period of data collection for this study, a patient has not had sufficient time to assimilate the implications of an incongruent coupling between situation-locus of control. Therefore, the effects of incongruency would not be apparent until a later phase of convalescence. Also, another

possible explanation for negative findings might be that the categorization of a patient in this study as either congruent or incongruent might have resulted in too gross a measure of this variable to be able to subsequently discern relationships with other variables.

#### Hypothesis VI

Hypothesis VI, which proposed that there was no significant relationship between locus of control, health locus of control, health value, and perception of the situation, was rejected. Locus of control was found to be significantly related to both health locus of control ( $r=.4733$ ,  $p<.01$ ) and perception of the situation ( $r=.2717$ ,  $p<.05$ ). The identification of these relationships was not surprising.

The Health Locus of Control Scale (HLC Scale), which served as a measure of health locus of control for this study, was developed on the basis of Rotter's construct of locus of control (Wallston et al 1976). The correlation of  $r=.4733$  found in this study between the HLC Scale and the Rotter I-E Scale is supportive of the HLC Scale's concurrent validity, as was documented during initial scale development. It can be seen that there was approximately a 23% common variance found between the two scales in this study. It is quite surprising that even with acceptable concurrent validity, the HLC Scale did not correlate significantly



with any study variable; not even the two variables with which locus of control was found to correlate. The construct validity of the HLC Scale must be seriously questioned based on these findings.

Locus of control also was found to correlate significantly with perception of the recovery situation. It is not surprising that a patient who tended toward internality might also view the recovery situation as skill-controlled, and that a more external patient might view recovery as more chance-controlled. This finding indicates that a patient tends to generalize from past life experiences, which helped to determine his locus of control, to the present situation of recovery from infarction (Phares 1976). On the basis of this finding, it would be important to assist a patient in formulating an accurate view of recovery, for he might tend to rely on generalizations from past experiences and not perceive the situation accurately.

#### Hypothesis VII

Hypothesis VII was formulated to determine if significant predictive relationships existed between social learning variables and psychological, cognitive, attitudinal, and recovery variables. The hypothesis was rejected when predictive relationships were identified.

It will be recalled that a deficit identified during the literature review was that many investigators attempted to use hypotheses derived from social learning theory without proper consideration of other social learning variables and their relationships to behaviors of concern. For example, many investigators studied only the locus of control variable in an attempt to understand behavior, without consideration of the other social learning variables of which a knowledge is considered essential for enhanced prediction. Hypothesis VII, which included all the major social learning variables (locus of control, health value, perception of the situation, and situation-locus of control congruency/incongruency), was formulated to ascertain the contribution of these multiple variables to prediction of selected recovery behaviors. Health locus of control also was included with the social learning variables as a more specific measure of locus of control.

Multiple variables were found to explain significantly more variance than single variables in every instance in which social learning variables were significantly regressed on convalescence behaviors. Selected social learning variables accounted for 9% to 14% of the variance in the behaviors of concern. Perception of the situation and health locus of control predicted 10% of the variance in anxiety. A more chance-controlled perception of the situation and a

more external health locus of control were associated with greater anxiety. Perception of the situation, health value, and locus of control predicted 12% of the variance in depression. A more chance-controlled view of recovery, greater health value, and a more external locus of control were associated with greater depression. Perception of the situation, health value, and situation-locus of control congruency/incongruency predicted 13% of the variance in perceived health status. A more chance-controlled view of recovery, higher health value, and more incongruency of situation-locus of control were associated with a poorer perception of health status. It should be emphasized that the social learning variable which contributed most heavily to explanation of variance for anxiety, depression, and perceived health status, was perception of the situation.

It is necessary to briefly elaborate on the relationship between perception of the situation and the dependent variables just discussed. Recall that denial II was highly correlated with anxiety, depression and perceived health status. When it was held constant and relationships between perception of the situation and anxiety, depression, and perceived health status were re-examined, they became nonsignificant, as discussed under Hypothesis IV. It seems that perception of the situation does account for a significant proportion of variance in anxiety, depression, and

perceived health status, but that the scale used in this study to measure denial II may have been a better indicator of anxiety, depression, and perception of health status than the measures that were used to determine these variables.

Social learning variable predictions to the remaining dependent variables in Hypothesis VII were straightforward. Perception of the situation, locus of control, situation-locus of control congruency/incongruency, and health value accounted for 13% of the variance in denial II. A more skill-controlled view of recovery, a more internal locus of control, a more incongruent coupling between situation-locus of control, and a higher health value were associated with greater denial II. Locus of control, health value, situation-locus of control congruency/incongruency, and perception of the situation accounted for 14% of the variance in health knowledge. A more internal locus of control, greater health value, more incongruency between situation-locus of control, and a skill-controlled view of recovery were associated with greater health knowledge. Health value and locus of control accounted for 9% of the variance in incidence of pain. Greater health value and a more internal locus of control were associated with a lesser incidence of cardiac pain. Social learning variables did not predict significantly to information-seeking, incidence of arrhythmia, days in CCU, or total days in the hospital.

An overall assessment of the statistical findings for Hypothesis VII seems to indicate that although it would certainly be desirable to account for even greater variance in dependent variables, the 10% to 14% which was accounted for by the social learning variables was impressive. In fact, Cohen (1977) proposed that for the behavioral sciences a 13% proportion of explained variance represented a medium effect size as contrasted with 2% for a small effect size and 26% for a large effect size. Also, the magnitude of the significant correlations between the social learning variables and other variables is comparable to those reported in the literature for other studies concerned with myocardial infarction patients (Cromwell et al 1977, Garrity and Klein 1975, Gentry and Haney 1975).

It appears that social learning theory may be useful as a preliminary framework for the explanation and prediction of early convalescence behaviors known to affect recovery in the myocardial infarction patient. It is important to emphasize, however, that increased validity and reliability must be achieved for measures of the social learning variables. Additionally, it must be pointed out that this study did not provide a determination of the direction of association between social learning variables and the variables on which they were regressed.

Related Findings

## Anxiety

Age, depression, and denial II were found to correlate significantly with anxiety. This indicates that increased anxiety was associated with younger age, increased depression, and decreased denial II, while decreased anxiety was associated with older age, decreased depression, and increased denial II.

The significant relationship between age and anxiety is contrary to the findings of Rosen and Bibring (1966) and Bruhn (1966). A possible explanation may be related to the fact that more young people (i.e., thirty to fifty years of age) are now experiencing myocardial infarctions than a decade ago. It is reasonable that it is these individuals, struck unexpectedly during the prime of life, who respond with greater anxiety than older individuals.

The relationship of anxiety with depression and denial II supports previous findings and was expected (Froese et al 1974). The correlation ( $r=.8014$ ) between anxiety and depression indicates that these two psychological states shared approximately 64% common variance. As discussed in Chapter III, it is unknown whether this correlation represents lack of discriminant validity between the measurement scales used or whether anxiety and depression do, in fact,

have common underlying psychological dynamics. The correlation of anxiety with denial ( $r = -.5497$ ) indicates that 30% of anxiety was accounted for by denial II. Other than depression, denial II was the best single indicator of anxiety state.

### Depression

Denial II and anxiety were significantly correlated with depression. In addition, information-seeking II also was correlated with depression. The significant relationships indicate that increased depression was associated with increased anxiety, decreased denial II, and decreased information-seeking, while decreased depression was associated with decreased anxiety, increased denial II and increased information-seeking.

The relationship between anxiety and depression was discussed in the preceding subsection and will not be discussed again here. Denial II accounted for approximately 20% of the variance in depression which is similar to what was found for anxiety. Information-seeking II accounted for only 5% of depression variance. As found with anxiety, the best single indicator of level of depression in this study other than anxiety, was denial II.

Aside from being a significant indicator of both anxiety and depression, denial II also was associated with perceived health status, perception of the situation, information-seeking II, incidence of pain, and sex. This can be interpreted to mean that as denial II increased it was associated with a lesser incidence of cardiac pain; lesser degrees of anxiety, depression, and information-seeking II; a more positive perception of health status; and a view of recovery as being skill-controlled. Finally, denial II also was associated with being male.

It would seem from the description of the observed relationships between denial II and other study variables that denial II was, perhaps, the single best indicator of a patient's risk for poor recovery outcomes. The fact that a patient with increased denial of the threat of myocardial infarction was less emotionally upset, perceived his present health status more positively, and viewed recovery as skill-controlled, tended to enhance his chance for favorable recovery outcomes (Stern, Pascale, and McLoone 1976; Cromwell et al 1977; Garrity 1973a, 1973b; Cay et al 1973). For patients with decreased denial II the exact opposite would be expected. The discovery of these important relationships indicates that the influence of denial II on recovery outcomes must be further investigated to determine the role of this important variable.



It was not surprising that denial II was associated negatively with sex so that males were more denying of the psychological meaning of myocardial infarction. This finding can probably be attributed to social conditioning of males for whom it is customarily a sign of weakness to admit fears and concerns. Also, the finding that those patients with increased denial sought less specific information was not unexpected. In light of this, however, it was surprising to find that health knowledge and denial II were not associated. It appears that level of denial II does not significantly affect the amount of health knowledge acquired.

#### Health Knowledge

Health knowledge was found to be negatively associated with age, sex, and locus of control, while it was positively associated with information-seeking I. These findings indicate that increased knowledge was found in those patients who were younger, male, and who had a more internal locus of control, while decreased knowledge was found in those who were older, female, and who had a more external locus of control.

The variable which accounted for the most explained variance in health knowledge was locus of control (12%). As discussed earlier in this chapter under Hypothesis I, locus of control has proved to be an important predictor of

knowledge acquisition. Hopefully, the confirmation of the relationship with myocardial infarction patients will be helpful for the planning and implementation of patient education efforts. The fact that age and sex were also associated with health knowledge should suggest their importance in educational planning as well.

#### Information-Seeking

As described above, health knowledge was the only variable which correlated significantly with information-seeking I so that increased knowledge was associated with increased information regarding specific areas of care. Information seeking II was significantly associated with denial II, depression, and severity of attack so that an increased desire for additional information regarding specific areas of care was related to decreased denial II, decreased depression, and a less severe myocardial infarction. Those patients with increased denial II, increased depression, and a more severe myocardial infarction tended to exhibit less of a desire for specific information. Awareness of these relationships should assist the nurse to identify those patients who may not be active seekers of information, yet who may require it.

### Perception of Health Status

Denial II, depression, and prior cardiac history were the variables which were significantly related to a patient's perception of his health status. A patient with a low level of denial II, a past history of cardiac problems, or who was more depressed, tended to view his current health status less favorably than a patient who denied more, had a negative cardiac history, or who was less depressed. It is of considerable interest that there was no relationship discovered between a patient's perception of his health status and the severity of his myocardial infarction.

Based on the consistent finding that a patient's perception of his health status following myocardial infarction is one of the most important determinants of recovery outcomes (Garritty 1973a, Cay et al 1973), it seems essential for nurses to develop a better understanding of this patient behavior. Although this study could not determine causation or direction of relationships between variables, it does seem reasonable that low denial II and prior cardiac history may have resulted in poorer perception of health, just as high denial II and a negative cardiac history may have resulted in a better perception of health. It is not clear whether degree of depression might have affected the formulation of a perception of health status, or whether it resulted from it.

These findings related to perception of health status can assist the nurse to begin to identify those patients who might have inappropriate perceptions of their health status, and who may require special interventions directed toward developing a more accurate perception.

### Summary

This chapter has presented a discussion and interpretation of the characteristics of the study sample, the hypotheses, and related findings. Chapter VI will present the conclusions, implications, and recommendations of the investigation.

## CHAPTER VI

### CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

#### Conclusions

Based on the findings from the study, the following conclusions related to the null hypotheses were made:

1. Hypothesis I was rejected upon finding a significant relationship between locus of control and health knowledge, and locus of control and level of education. It was concluded that locus of control was an important variable affecting the amount of health knowledge acquired, and that level of education was not a confounding factor in the relationship between locus of control and health knowledge.

2. Hypothesis II failed to be rejected upon finding no significant relationships between health locus of control and selected study variables. It was concluded that health locus of control, as measured in this study, was not an important variable in determining a patient's response to myocardial infarction.

3. Hypothesis III was rejected upon finding a significant relationship between health value and incidence of cardiac pain. It was concluded that health value, as measured in this study, was not an important variable in determining a patient's response to myocardial infarction,

even though it did correlate significantly with incidence of cardiac pain.

4. Hypothesis IV was rejected upon finding a significant relationship of perception of the recovery situation with denial II and with sex. It was concluded that perception of the situation was an important variable which affected, or was affected by, a patient's degree of acceptance of the potential implications of a myocardial infarction. It was also concluded that a patient's sex was an important determinant of the way in which the recovery situation was viewed.

5. Hypothesis V was rejected upon finding a significant relationship of situation-locus of control congruency/incongruency with social status and with sex. It was concluded, however, that situation-locus of control, congruency/incongruency was not an important variable in determining a patient's response to myocardial infarction--at least during the period of early convalescence. It was also concluded that both social status and sex merit further investigation to more fully determine their influence on situation-locus of control congruency/incongruency.

6. Hypothesis VI was rejected upon finding a significant relationship of locus of control with health locus of control and with perception of the situation. It was concluded that there was concurrent validity between the Rotter

Internal-External Locus of Control Scale and the Health Locus of Control Scale. It was also concluded that a patient tended to generalize from past experiences, which were instrumental in determining his locus of control, to the present recovery from infarction situation.

7. Hypothesis VII was rejected upon finding significant predictive relationships between social learning variables and each of the following variables: anxiety, depression, denial II, health knowledge, perception of health status, and incidence of cardiac pain. It was concluded that social learning theory has some documented applicability as a preliminary framework for the explanation and prediction of early convalescence behaviors known to affect recovery in the myocardial infarction patient. It was also concluded that an effort to achieve enhanced validity and reliability of measures of social learning variables is required.

Other conclusions were formulated based on an analysis of related findings. These conclusions are listed below:

1. There was a significant relationship between anxiety and the following variables: age, depression, and denial II. It was concluded that these variables were important to an understanding of the phenomenon of anxiety during early convalescence.

2. There was a significant relationship between Depression and the following variables: anxiety, denial II,

and information-seeking II. It was concluded that these variables were important to an understanding of the phenomenon of depression during early convalescence.

3. There was a significant relationship between denial II and the following variables: anxiety, depression, perception of health status, perception of the recovery situation, information-seeking II, incidence of cardiac pain, and sex. It was concluded that the denial II variable was the single best indicator of a patient's level of risk for poor recovery outcomes.

4. There was a significant relationship between health knowledge and the following variables: locus of control, age, sex, and information-seeking I. It was concluded that locus of control was the single best indicator of amount of knowledge acquired regarding health state. It was also concluded that age and sex were important variables influencing knowledge regarding myocardial infarction.

5. There was a significant relationship between information-seeking I and health knowledge. It was concluded that this relationship enhanced the validity of the measures used to determine information-seeking I and health knowledge, as the score on one scale was directly related to the score on the other scale.

6. There was a significant relationship between information-seeking II and the following variables: denial II,



depression, and severity of attack. It was concluded that the degree of a patient's desire for specific information regarding his health state may be a function of his psychological, as well as his physiological, state.

7. There was a significant relationship between a patient's perception of his health status and the following variables: denial II, depression, and prior cardiac history. It was concluded that psychological status and perception of health status had a significant influence upon each other, the direction of which was indeterminable from this study. It was also concluded that a patient's prior cardiac history was an important variable which affected the perception of present health status.

#### Implications for Nursing

An important implication of this investigation is that social learning theory was determined to have some applicability as a framework for the explanation and prediction of early convalescence behaviors known to affect recovery of the myocardial infarction patient. Although some findings of this investigation failed to support predictions derived from social learning theory, several findings were supportive of the theory.

The identification of locus of control as the most significant indicator of the amount of knowledge a patient

possesses regarding his myocardial infarction implies that utilization of this variable by nurses in planning and implementing cardiac rehabilitation programs may be important. The finding that a patient with a more internal locus of control appears to learn more than a patient who is more external, and that this learning is independent of setting and educational program, provides direction to the nurse who is responsible for patient education.

The relationship discovered between a patient's perception of the recovery situation and denial II also has important implications for nursing. If it can be determined that perception of the recovery situation results in varying degrees of denial II, as distinguished from degree of denial II determining the perception of the situation, then the way in which a patient views the recovery situation would become an even more important variable. It would mediate degree of denial II which has been shown in this investigation to be the single best indicator of level of risk for poor recovery. The nurse's awareness, for instance, that a patient who views recovery as chance-controlled would tend to manifest lower degrees of denial II would alert the nurse to expect that this patient might also be more anxious, depressed, and might be unnecessarily pessimistic regarding his health status. This kind of knowledge would be helpful

in the formulation of specific nursing intervention designed to promote successful recovery. Even if denial II is found to mediate a patient's perception of the recovery situation, in contrast to the direction of the relationship proposed above, it would remain important to determine the effects of a specific perception of the situation on long-term recovery outcomes.

Another important implication derived from this study is that multiple variables were found to explain significantly more variance than single variables in every instance when social learning variables were regressed on convalescence behaviors. This indicates that the nurse must develop and utilize a broad knowledge of multiple patient factors which affect behaviors if he wishes provide more effective care.

The finding that the severity of a patient's infarction was not related to degree of anxiety, depression, and denial II indicates that nurses cannot assume that a patient interprets his clinical situation as would be expected, or in the way in which health professionals do. In fact, a patient's perception of his current health status post-infarction is not related in any way to the severity of the infarction. These findings have important implications for nursing in that the patient cannot be expected to accurately assess his clinical condition. His overestimation or

underestimation of his health status could result in many undesirable consequences. The nurse who is responsible for assisting the patient to adapt to his level of wellness, should help the patient to formulate an accurate understanding of his health state and its implications.

The present investigation also indicates that age and sex are helpful variables in determining some of the patient behaviors which occur during early convalescence. It appears that for age, the younger the patient, the greater the anxiety, and the younger the patient, the greater the health knowledge. When sex is considered, being male is associated with greater denial II, and greater health knowledge. Knowledge of these relationships can be expected to provide greater direction for nursing care of the myocardial infarction patient during convalescence.

In summary, the results of this study have provided nursing with a theoretical framework for rehabilitation of the myocardial infarction patient which has demonstrated a limited, but important contribution to the explanation and prediction of selected convalescence behaviors known to affect recovery outcomes. This preliminary documentation of social learning theory's applicability to convalescence of the myocardial infarction patient should encourage coordinated investigation to more definitively define the theory's utility to nursing practice.

### Recommendations

The findings of the present study, as well as the need to further determine the empirical and pragmatic adequacy of social learning theory for nursing practice, support the necessity for further investigation in this area. Specific recommendations for additional investigation include:

1. Social learning theory should be utilized and evaluated as a theoretical framework for a cardiac rehabilitation program. One focus of evaluation should include a determination of the theory's practical significance in terms of cost-effectiveness, patient benefit, and staff satisfaction.

2. A longitudinal study should be conducted to determine social learning theory's applicability to later stages of convalescence, specifically from hospital discharge through the first year.

3. Further investigation of the validity of the measure selected to determine patient locus of control should be instituted.

4. Exploration of the relationship between locus of control and the coronary prone personality should be initiated.

5. A prospective study should be initiated to obtain measures of locus of control before the occurrence of a myocardial infarction. This would allow a determination of

the effect of myocardial infarction upon locus of control.

6. The development of valid and reliable measures of a specific expectancy for locus of control for health and for recovery from myocardial infarction is encouraged.

7. A longitudinal study should be conducted to determine the effects of a patient's perception of the recovery situation during early convalescence upon recovery outcomes.

8. A longitudinal study should be conducted to determine the effects of denial II upon recovery outcomes.

9. The present study should be replicated using different measures of anxiety, depression, and denial II to determine the reliability of study findings involving these variables.

10. A valid and reliable measure of health value should be developed to ascertain the degree of consistent value placed upon health.

11. Perception of health status following myocardial infarction should be the focus of continued investigation to further elucidate its determinants as well as its effects upon recovery outcomes.

12. Nursing should continue to seek and develop theoretical formulations which facilitate the attainment of professional practice goals.

## APPENDIX A

Rotter Internal-External Locus of Control Scale

No. \_\_\_\_\_

## ROTTER'S INTERNAL-EXTERNAL LOCUS OF CONTROL SCALE

The following statements seek your opinions in areas of general social concern. Each item consists of a pair of alternatives lettered a or b. Please select the one statement of each pair (and only one) which you more strongly believe to be the case. Be sure to select either a or b on each item - do not leave any unanswered. Indicate your selection by drawing a circle around the letter a or b, whichever is closer to your own opinion.

1.   a.    Children get into trouble because their parents punish them too much.  
      b.    The trouble with most children nowadays is that their parents are too easy with them.
2.   a.    Many of the unhappy things in people's lives are partly due to bad luck.  
      b.    People's misfortunes result from the mistakes they make.
3.   a.    One of the major reasons why we have wars is because people don't take enough interest in politics.  
      b.    There will always be wars, no matter how hard people try to prevent them.
4.   a.    In the long run people get the respect they deserve in this world.  
      b.    Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.
5.   a.    The idea that teachers are unfair to students is nonsense.  
      b.    Most students don't realize the extent to which their grades are influenced by accidental happenings.
6.   a.    Without the right breaks one cannot be an effective leader.  
      b.    Capable people who fail to become leaders have not taken advantage of their opportunities.
7.   a.    No matter how hard you try some people just don't like you.  
      b.    People who can't get others to like them don't understand how to get along with others.
8.   a.    Heredity plays the major role in determining one's personality.  
      b.    It is one's experiences in life which determine what they're like.



9.    a.    I have often found that what is going to happen will happen.  
      b.    Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.
10.   a.    In the case of the well prepared student there is rarely if ever such a thing as an unfair test.  
      b.    Many times exam questions tend to be so unrelated to course work that studying is really useless.
11.   a.    Becoming a success is a matter of hard work, luck has little or nothing to do with it.  
      b.    Getting a good job depends mainly on being in the right place at the right time.
12.   a.    The average citizen can have an influence in government decisions.  
      b.    This world is run by the few people in power, and there is not much the little guy can do about it.
- 13    a.    When I make plans, I am almost certain that I can make them work.  
      b.    It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.
14.   a.    There are certain people who are just no good.  
      b.    There is some good in everybody.
15.   a.    In my case getting what I want has little or nothing to do with luck.  
      b.    Many times we might just as well decide what to do by flipping a coin.
16.   a.    Who gets to be the boss often depends on who was lucky enough to be in the right place first.  
      b.    Getting people to do the right thing depends upon ability, luck has little or nothing to do with it.
17.   a.    As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.  
      b.    By taking an active part in political and social affairs the people can control world events.
18.   a.    Most people don't realize the extent to which their lives are controlled by accidental happenings.  
      b.    There really is no such thing as "luck".

19.   a.    One should always be willing to admit mistakes.  
      b.    It is usually best to cover up one's mistakes.
20.   a.    It is hard to know whether or not a person really likes you.  
      b.    How many friends you have depends upon how nice a  
            person you are.
21.   a.    In the long run the bad things that happen to us are  
            balanced by the good ones.  
      b.    Most misfortunes are the result of lack of ability,  
            ignorance, laziness, or all three.
22.   a.    With enough effort we can wipe out political corruption.  
      b.    It is difficult for people to have much control over the  
            things politicians do in office.
23.   a.    Sometimes I can't understand how teachers arrive at the  
            grades they give.  
      b.    There is a direct connection between how hard I study and  
            the grades I get.
24.   a.    A good leader expects people to decide for themselves what  
            they should do.  
      b.    A good leader makes it clear to everybody what their jobs  
            are.
25.   a.    Many times I feel that I have little influence over the things  
            that happen to me.  
      b.    It is impossible for me to believe that chance or luck plays  
            an important role in my life.
26.   a.    People are lonely because they don't try to be friendly.  
      b.    There's not much use in trying too hard to please people,  
            if they like you, they like you.
27.   a.    There is too much emphasis on athletics in high school.  
      b.    Team sports are an excellent way to build character.
28.   a.    What happens to me is my own doing.  
      b.    Sometimes I feel that I don't have enough control over the  
            direction my life is taking.
29.   a.    Most of the time I can't understand why politicians behave  
            the way they do.  
      b.    In the long run the people are responsible for bad govern-  
            ment on a national as well as on a local level.

## ROTTER INTERNAL-EXTERNAL LOCUS OF CONTROL SCALE KEY

1.	filler item	21.	A
2.	A	22.	B
3.	B	23.	A
4.	B	24.	filler item
5.	B	25.	A
6.	A	26.	B
7.	A	27.	filler item
8.	filler item	28.	B
9.	A	29.	A
10.	B		
11.	B		
12.	B		
13.	B		
14.	filler item		
15.	B		
16.	A		
17.	A		
18.	A		
19.	filler item		
20.	A		

Score is the number of external item responses chosen. The higher the score, the more external the locus of control.

## APPENDIX B

### Health Locus of Control Scale

No. \_\_\_\_\_

## HEALTH LOCUS OF CONTROL SCALE

This is a questionnaire to determine the way in which different people view certain important health-related issues. Each item is a belief statement with which you may agree or disagree. Beside each statement is a scale which ranges from strongly disagree (1) to strongly agree (6). For each item you are to circle the number that represents the extent to which you disagree or agree with the statement. The more strongly you agree with a statement, then the higher will be the number you circle. The more strongly you disagree with a statement, the lower will be the number you circle. Please circle only one number. This is a measure of your personal beliefs; obviously there are no right or wrong answers.

Please answer these items carefully but do not spend too much time on any one item. Be sure to answer every item. Also, try to respond to each item independently when making your choice; do not be influenced by your previous choices. It is important that you respond according to your actual beliefs and not according to how you feel you should believe.

		Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1.	If I take care of myself, I can avoid illness.	1	2	3	4	5	6
2.	Whenever I get sick it is because of something I've done or not done.	1	2	3	4	5	6
3.	Good health is largely a matter of good fortune.	1	2	3	4	5	6
4.	No matter what I do, if I am going to get sick I will get sick.	1	2	3	4	5	6
5.	Most people do not realize the extent to which their illnesses are controlled by accidental happenings.	1	2	3	4	5	6

		Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
6.	I can only do what my doctor tells me to do	1	2	3	4	5	6
7.	There are so many strange diseases around, that you can never know how or when you might pick one up.	1	2	3	4	5	6
8.	When I feel ill, I know it is because I have not been getting the proper exercise or eating right.	1	2	3	4	5	6
9.	People who never get sick are just plain lucky.	1	2	3	4	5	6
10.	People's ill health results from their own carelessness.	1	2	3	4	5	6
11.	I am directly responsible for my health.	1	2	3	4	5	6

## HEALTH LOCUS OF CONTROL SCALE KEY

Items 3, 4, 5, 6, 7, and 9 are worded in the external direction and are scored from 1 - 6 as they are circled by the subject.

Items 1, 2, 8, 10, and 11 are worded in the internal direction and are reversed scored (by subtracting the circled response from the Number 7).

Total HLC score is the sum of all 11 items after reversing the scores for the internal items.. The higher the total score, the more external the beliefs.

## APPENDIX C

### Multiple Affect Adjective Checklist



## MULTIPLE AFFECT ADJECTIVE

## CHECK LIST

DIRECTIONS: On the next sheet you will find words which describe different kinds of moods and feelings. Mark an X in the boxes beside the words which describe how you have been feeling during this hospitalization. Some of the words may sound alike, but I want you to check all the words that describe your feelings. Work quickly.

- |  |  |  |
|--|--|--|
| 1 <input type="checkbox"/> active        | 45 <input type="checkbox"/> fit          | 89 <input type="checkbox"/> peaceful       |
| 2 <input type="checkbox"/> adventurous   | 46 <input type="checkbox"/> forlorn      | 90 <input type="checkbox"/> pleased        |
| 3 <input type="checkbox"/> affectionate  | 47 <input type="checkbox"/> frank        | 91 <input type="checkbox"/> pleasant       |
| 4 <input type="checkbox"/> afraid        | 48 <input type="checkbox"/> free         | 92 <input type="checkbox"/> polite         |
| 5 <input type="checkbox"/> agitated      | 49 <input type="checkbox"/> friendly     | 93 <input type="checkbox"/> powerful       |
| 6 <input type="checkbox"/> agreeable     | 50 <input type="checkbox"/> frightened   | 94 <input type="checkbox"/> quiet          |
| 7 <input type="checkbox"/> aggressive    | 51 <input type="checkbox"/> furious      | 95 <input type="checkbox"/> reckless       |
| 8 <input type="checkbox"/> alive         | 52 <input type="checkbox"/> gay          | 96 <input type="checkbox"/> rejected       |
| 9 <input type="checkbox"/> alone         | 53 <input type="checkbox"/> gentle       | 97 <input type="checkbox"/> rough          |
| 10 <input type="checkbox"/> amiable      | 54 <input type="checkbox"/> glad         | 98 <input type="checkbox"/> sad            |
| 11 <input type="checkbox"/> amused       | 55 <input type="checkbox"/> gloomy       | 99 <input type="checkbox"/> safe           |
| 12 <input type="checkbox"/> angry        | 56 <input type="checkbox"/> good         | 100 <input type="checkbox"/> satisfied     |
| 13 <input type="checkbox"/> annoyed      | 57 <input type="checkbox"/> good-natured | 101 <input type="checkbox"/> secure        |
| 14 <input type="checkbox"/> awful        | 58 <input type="checkbox"/> grim         | 102 <input type="checkbox"/> shaky         |
| 15 <input type="checkbox"/> bashful      | 59 <input type="checkbox"/> happy        | 103 <input type="checkbox"/> shy           |
| 16 <input type="checkbox"/> bitter       | 60 <input type="checkbox"/> healthy      | 104 <input type="checkbox"/> soothed       |
| 17 <input type="checkbox"/> blue         | 61 <input type="checkbox"/> hopeless     | 105 <input type="checkbox"/> steady        |
| 18 <input type="checkbox"/> bored        | 62 <input type="checkbox"/> hostile      | 106 <input type="checkbox"/> stubborn      |
| 19 <input type="checkbox"/> calm         | 63 <input type="checkbox"/> impatient    | 107 <input type="checkbox"/> stormy        |
| 20 <input type="checkbox"/> cautious     | 64 <input type="checkbox"/> incensed     | 108 <input type="checkbox"/> strong        |
| 21 <input type="checkbox"/> cheerful     | 65 <input type="checkbox"/> indignant    | 109 <input type="checkbox"/> suffering     |
| 22 <input type="checkbox"/> clean        | 66 <input type="checkbox"/> inspired     | 110 <input type="checkbox"/> sullen        |
| 23 <input type="checkbox"/> complaining  | 67 <input type="checkbox"/> interested   | 111 <input type="checkbox"/> sunk          |
| 24 <input type="checkbox"/> contented    | 68 <input type="checkbox"/> irritated    | 112 <input type="checkbox"/> sympathetic   |
| 25 <input type="checkbox"/> contrary     | 69 <input type="checkbox"/> jealous      | 113 <input type="checkbox"/> tame          |
| 26 <input type="checkbox"/> cool         | 70 <input type="checkbox"/> joyful       | 114 <input type="checkbox"/> tender        |
| 27 <input type="checkbox"/> cooperative  | 71 <input type="checkbox"/> kindly       | 115 <input type="checkbox"/> tense         |
| 28 <input type="checkbox"/> critical     | 72 <input type="checkbox"/> lonely       | 116 <input type="checkbox"/> terrible      |
| 29 <input type="checkbox"/> cross        | 73 <input type="checkbox"/> lost         | 117 <input type="checkbox"/> terrified     |
| 30 <input type="checkbox"/> cruel        | 74 <input type="checkbox"/> loving       | 118 <input type="checkbox"/> thoughtful    |
| 31 <input type="checkbox"/> daring       | 75 <input type="checkbox"/> low          | 119 <input type="checkbox"/> timid         |
| 32 <input type="checkbox"/> desperate    | 76 <input type="checkbox"/> lucky        | 120 <input type="checkbox"/> tormented     |
| 33 <input type="checkbox"/> destroyed    | 77 <input type="checkbox"/> mad          | 121 <input type="checkbox"/> understanding |
| 34 <input type="checkbox"/> devoted      | 78 <input type="checkbox"/> mean         | 122 <input type="checkbox"/> unhappy       |
| 35 <input type="checkbox"/> disagreeable | 79 <input type="checkbox"/> meek         | 123 <input type="checkbox"/> unsociable    |
| 36 <input type="checkbox"/> discontented | 80 <input type="checkbox"/> merry        | 124 <input type="checkbox"/> upset         |
| 37 <input type="checkbox"/> discouraged  | 81 <input type="checkbox"/> mild         | 125 <input type="checkbox"/> vexed         |
| 38 <input type="checkbox"/> disgusted    | 82 <input type="checkbox"/> miserable    | 126 <input type="checkbox"/> warm          |
| 39 <input type="checkbox"/> displeased   | 83 <input type="checkbox"/> nervous      | 127 <input type="checkbox"/> whole         |
| 40 <input type="checkbox"/> energetic    | 84 <input type="checkbox"/> obliging     | 128 <input type="checkbox"/> wild          |
| 41 <input type="checkbox"/> enraged      | 85 <input type="checkbox"/> offended     | 129 <input type="checkbox"/> willful       |
| 42 <input type="checkbox"/> enthusiastic | 86 <input type="checkbox"/> outraged     | 130 <input type="checkbox"/> wilted        |
| 43 <input type="checkbox"/> fearful      | 87 <input type="checkbox"/> panicky      | 131 <input type="checkbox"/> worrying      |

## APPENDIX D

### Attitude Questionnaire

ATTITUDE QUESTIONNAIRE

In order to help patients like yourself, I would like to know how YOU FEEL about your illness and its causes. I would also like to know what things YOU FEEL will help you get better. There are no right or wrong answers - what I am interested in is YOUR OPINION.

No. \_\_\_\_\_

DIRECTIONS: In the following questions circle the one response which most closely represents your opinion.

1. Since coming to the hospital, has anyone told you that you had a heart attack?

Yes ( ) No ( )

If Yes indicate who told you (circle all who did).

- a. private doctor
- b. nurse
- c. spouse
- d. friend
- 3. other \_\_\_\_\_

2. Regarding your illness, which of the following statements do you believe to be true?

- a. I had a heart attack
- b. I did not have a heart attack
- c. I am not sure whether or not I had a heart attack

3. If you believe you had a heart attack, how severe do you think it was?

- a. very severe
- b. severe
- c. moderate
- d. mild
- e. very mild

4. What do you consider to be your present state of health in light of this illness?

- a. superior
- b. above average
- c. average
- d. below average
- e. considerably below average

5. Because of this illness, do you believe you will

- a. always be weak
- b. gain some strength, but never return to normal
- c. recover completely

6. Apart from your present illness, what do you consider to be your typical overall state of health?

- a. superior
- b. above average
- c. average
- d. below average
- e. considerably below average

7. What do you think are the chances of your having a heart attack in the future?

- a. great
- b. moderate
- c. small
- d. none

8. After a heart attack, most people

- a. are not able to return to work
- b. are able to return to work, but don't
- c. do return to their old jobs
- d. do return to work, but to a less demanding job

9. What do you plan to do about your job?

- a. return to old job, part time, in \_\_\_\_ weeks
- b. return to old job, full time, in \_\_\_\_ weeks
- c. return to work, but different job in \_\_\_\_ weeks
- d. retire
- e. not applicable, I'm retired already
- f. don't know

10. What have you discussed with the doctor or nurse regarding diet?

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11. What have you discussed regarding activity at home?

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12. What have you discussed regarding smoking?

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---

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13. What have you discussed regarding medication?

---

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14. Have you received any special instruction not included in the preceding questions?

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15. I personally feel that lowering my blood cholesterol decreases my risk of having a heart attack.

- a. greatly
- b. somewhat
- c. very little
- d. not at all
- e. not applicable

16. I personally feel that losing weight decreases my risk of having a heart attack.

- a. greatly
- b. somewhat
- c. very little
- d. not at all
- e. not applicable

17. I personally feel that keeping my blood pressure under control decreases my risk of having a heart attack.

- a. greatly
- b. somewhat
- c. very little
- d. not at all
- e. not applicable

18. I personally feel that taking my medications as prescribed decreases my risk of having a heart attack.

- a. greatly
- b. somewhat
- c. very little
- d. not at all
- e. not applicable

19. I personally feel that following my doctor's instructions about activity decreases my risk of having a heart attack.

- a. greatly
- b. somewhat
- c. very little
- d. not at all
- e. not applicable

20. I personally feel that trying to reduce stress in my life decreases my risk of having a heart attack.

- a. greatly
- b. somewhat
- c. very little
- d. not at all
- e. not applicable

21. Most of what you know about heart disease you learned from

- a. friend who has had a heart attack
- b. friend who knows a lot about heart attacks
- c. spouse
- d. private doctor
- e. nurse
- f. own reading
- g. television
- h. other \_\_\_\_\_



22. During this hospitalization, have you experienced any of the following: (check appropriate space)

	Very Fre- quently (1)	Fre- quently (2)	Occasion- ally (3)	Rarely (4)	Never (5)
a. <u>trouble sleeping</u>	( )	( )	( )	( )	( )
b. <u>lack of energy</u>	( )	( )	( )	( )	( )
c. <u>chest pains</u>	( )	( )	( )	( )	( )
d. <u>overprotective family</u>	( )	( )	( )	( )	( )
e. <u>money worries</u>	( )	( )	( )	( )	( )
f. <u>worry about de- pendency on others</u>	( )	( )	( )	( )	( )
g. <u>worry about re- turning to work</u>	( )	( )	( )	( )	( )
h. <u>worry about not regaining health</u>	( )	( )	( )	( )	( )
i. <u>worry about another heart attack</u>	( )	( )	( )	( )	( )
j. <u>worry that I may die suddenly</u>	( )	( )	( )	( )	( )
k. <u>worry about effects of heart attack on family</u>	( )	( )	( )	( )	( )

23. Check the items you feel you need some more information about:

- |                                   |                                     |
|-----------------------------------|-------------------------------------|
| ( ) a. activity after discharge   | ( ) g. meaning of "take it easy"    |
| ( ) b. explanation of diet        | ( ) h. when to return to work       |
| ( ) c. explanation of medications | ( ) i. resources for financial help |
| ( ) d. what to expect in future   | ( ) j. how my family can help me    |
| ( ) e. ways to quit smoking       | ( ) k. what to do in an emergency   |
| ( ) f. sexual activity            | ( ) l. other                        |

24. How satisfied are you with the information you have received from doctors and nurses about your illness and treatment?

- a. very satisfied
- b. satisfied
- c. not satisfied
- d. very dissatisfied

25. Do you feel a need to have a place where you can get information and learn more about your health after you are discharged from the hospital?

- a. yes
- b. no
- c. not sure

26. Do you feel that your recovery from this illness depends pretty much upon things that you have the ability to control?

- a. strongly agree I can control recovery outcomes
- b. slightly agree I can control recovery outcomes
- c. slightly disagree I can control recovery outcomes
- d. strongly disagree I can control recovery outcomes

27. Before this illness, would you have consulted a doctor or gone to a clinic in any of the following hypothetical situations?

a. You have been feeling poorly for a few days

- ( ) certainly
- ( ) probably
- ( ) not very likely
- ( ) very unlikely

b. You felt you had a temperature of about 100 degrees

- ( ) certainly
- ( ) probably
- ( ) not very likely
- ( ) very unlikely

c. You felt you had a temperature of about 101 degrees

- ( ) certainly
- ( ) probably
- ( ) not very likely
- ( ) very unlikely

28. During the past one year how often were you bothered by:

a. Nervousness

b. Loneliness

( ) very often

( ) very often

( ) fairly often

( ) fairly often

( ) not very often

( ) not very often

( ) never

( ) never

29. Do you feel the past year has been

a. a "typical" year

b. more stressful than usual

c. less stressful than usual

30. In your opinion, your family's concern about your health status could be best described as

a. very concerned

b. concerned

c. not concerned

31. If you tell your wife or a friend that you will meet them somewhere at a definite time, how often do you arrive late?

a. frequently

b. once in a while

c. I am never late

32. How would your wife (or closest friend) rate you?

a. definitely hard-driving and competitive

b. probably hard-driving and competitive

c. probably relaxed and easy going

d. definitely relaxed and easy going

33. Are you content to remain at your present job level for the next five years?

a. yes

b. no

c. definitely no--I strive to advance and would become dissatisfied if not promoted in that length of time

d. not applicable.

34. Have you ever had a routine physical examination done for preventive health care and not because you were ill or experiencing symptoms at the time:

- a. yes, within the past one year
- b. yes, within the past three years
- c. not within the past five years
- d. I only see a doctor when I am ill, not for check-ups

35. In general, do you do any special things to try to keep healthy?

- a. yes
- b. no

What special things do you do? \_\_\_\_\_

36. In general, would you say you pay attention to your health:

- a. a great deal
- b. a moderate amount
- c. a little
- d. hardly at all

37. How would you describe your typical daily diet (before this illness)?

- a. I ate foods I enjoyed without concern for weight gain and/or rich food
- b. Usually I ate whatever I wanted to, but on occasion I worried about foods probably not good for me
- c. I was usually careful about my diet and tried to limit the amount of calories and/or cholesterol that I consumed
- d. I followed a fairly strict dietary program to protect my health

38. How would you describe your general level of physical exercise (before this illness):

- a. I engaged in very little physical exercise
- b. Occasionally I engaged in physical exercise, but not real frequently
- c. I engaged in moderate amounts of physical exercise, but it could have been more consistent
- d. I followed a planned program to ensure adequate amounts of physical exercise

39. How much overweight do you consider yourself to be?
- a. not at all
  - b. 5 to 10 pounds overweight
  - c. 10 to 20 pounds overweight
  - d. greater than 20 pounds
40. In general, how closely do you tend to follow a doctor's advice?
- a. very closely
  - b. moderately closely
  - c. somewhat closely
  - d. not very closely
  - e. not at all
41. In the past you have found you have to use your own judgment in deciding how much of the doctor's advice to follow:
- a. strongly agree with statement
  - b. moderately agree with statement
  - c. neither agree nor disagree with statement
  - d. moderately disagree with statement
  - e. strongly disagree with statement
42. How likely do you think it is that the treatment you will be given will help your illness?
- a. very likely
  - b. moderately likely
  - c. somewhat likely
  - d. not very likely
  - e. not at all likely
  - f. don't know
43. What things do you think will help your recover from this illness?
- 
- 
-

44. What are some things that you think might keep you from following the physician's advice after hospital discharge?

---

---

---

45. What is the highest level of education that you have completed?

---

## ATTITUDE QUESTIONNAIRE KEY

There are no correct answers for the Attitude Questionnaire. Rather patient responses are scored for selected items.

Perception of Health Status Scale - summation of weighted values for responses to Items 3, 4, 5, 7.

- |    |             |    |             |
|----|-------------|----|-------------|
| 3. | a. 5 points | 5. | a. 5 points |
|    | b. 4 points |    | b. 3 points |
|    | c. 3 points |    | c. 1 point  |
|    | d. 2 points |    |             |
|    | e. 1 point  |    |             |
| 4. | a. 1 point  | 7. | a. 5 points |
|    | b. 2 points |    | b. 3 points |
|    | c. 3 points |    | c. 1 point  |
|    | d. 4 points |    | d. 0 points |
|    | e. 5 points |    |             |

Higher scores represent a poorer perception of health status.

Information-Seeking I

- |     |                      |     |                      |
|-----|----------------------|-----|----------------------|
| 10. | 1 point if discussed | 13. | 1 point if discussed |
| 11. | 1 point if discussed | 14. | 1 point if discussed |
| 12. | 1 point if discussed |     |                      |

Higher scores represent greater information-seeking.

Information-Seeking II

23. 1 point for each item checked

Higher scores represent greater information-seeking.

Denial II

22. f, g, h, i, j, k - Summation of likert scale responses  
Higher scores represent greater denial.

Perception of Situation

26. 1 = response 1 (skill)  
2 = response 2, 3, 4 (chance)

Health Value Scale

34. a. 3 points  
b. 3 points  
c. 0 points  
d. 0 points
35. a. 2 points  
b. 0 points  
if list items add 1
36. a. 5 points  
b. 3 points  
c. 1 point  
d. 0 points
37. a. 0 points (if A or B on Item 39, then score 1)  
b. 1 point  
c. 3 points  
d. 5 points
- 38.. a. 0 points  
b. 1 point  
c. 3 points  
d. 5 points
39. Modifier for Item 37.

Higher scores represent a higher health value



## APPENDIX E

### Knowledge Questionnaire

KNOWLEDGE QUESTIONNAIRE

You may not have had an opportunity to learn about heart disease before, so you probably do not know a lot about heart problems at this time. In answering the questions, IF YOU ARE UNSURE, PLEASE DO NOT GUESS--SIMPLY ANSWER DON'T KNOW.

PLEASE CIRCLE THE BEST ANSWER FOR EACH QUESTION.

1. The heart muscle gets its own blood supply to do work from:
  - a. the chambers of the heart
  - b. the coronary arteries
  - c. the tissues surrounding the heart
  - d. don't know
2. In atherosclerosis, a buildup of fatty materials on inside of coronary blood vessels, the amount of blood that can be delivered to the heart muscle is usually:
  - a. increased
  - b. decreased
  - c. the same
  - d. don't know
3. A heart attack is caused by:
  - a. blood that is too thick
  - b. complete blockage of narrowed artery
  - c. spasm of heart muscle
  - d. don't know
4. A heart attack means:
  - a. a part of your heart muscle is damaged
  - b. your heart has been overworked
  - c. you have had chest pain
  - d. don't know
5. After a heart attack, healing takes place by a process which:
  - a. is never complete, leaving a "soft spot"
  - b. leads to a firm strong scar
  - c. leads to growth of new muscle
  - d. don't know
6. The average time necessary for the heart to heal after a heart attack is:
  - a. it never heals
  - b. three weeks
  - c. eight weeks
  - d. six months
  - e. don't know

7. Please list five (5) factors that research has shown contribute to causing a heart attack. If you cannot list five, list as many as you can:
- a. \_\_\_\_\_
  - b. \_\_\_\_\_
  - c. \_\_\_\_\_
  - d. \_\_\_\_\_
  - e. \_\_\_\_\_
8. After a heart attack, the process of atherosclerosis in the coronary arteries:
- a. is decreased
  - b. continues at the same rate
  - c. is increased
  - d. don't know
9. In atherosclerosis, the deposits inside the artery are composed of:
- a. sodium
  - b. cholesterol
  - c. iron
  - d. don't know
10. When cholesterol in the blood is increased, atherosclerosis is:
- a. less severe
  - b. not affected
  - c. more severe
  - d. don't know
11. The intake of saturated fats is:
- a. encouraged in your diet
  - b. discouraged in your diet
  - c. doesn't make any difference
  - d. don't know
12. Saturated fats are found in:
- a. animal foods that are usually solid at room temperature
  - b. vegetable foods that are usually liquid at room temperature
  - c. animal foods that are usually liquid at room temperature
  - d. don't know

13. For each food listed below, decide whether it will increase or will not increase blood cholesterol. If you don't know, don't guess.

	<u>Food</u>	<u>Increases</u> <u>cholesterol</u>	<u>Does not increase</u> <u>cholesterol</u>	<u>Don't</u> <u>know</u>
a.	corn oil	( )	( )	( )
b.	bread	( )	( )	( )
c.	fruit	( )	( )	( )
d.	butter	( )	( )	( )
e.	margarine	( )	( )	( )
f.	Pork	( )	( )	( )
g.	egg whites	( )	( )	( )
h.	egg yolks	( )	( )	( )
i.	shrimp	( )	( )	( )
j.	liver-	( )	( )	( )
k.	vegetable	( )	( )	( )
l.	cheese	( )	( )	( )
m.	whole milk	( )	( )	( )
n.	coconut oil	( )	( )	( )

14. When your blood pressure is high, your heart:

- a. does the same amount of work
- b. works harder
- c. works less
- d. don't know

15. With high blood pressure, atherosclerosis:

- a. becomes less severe
- b. is not affected
- c. becomes more severe
- d. don't know

16. People who smoke cigarettes have:

- a. the same number of heart attacks as non-smokers
- b. more heart attacks than non-smokers
- c. less heart attacks than non-smokers
- d. don't know

17. Some of the effects of cigarettes are due to nicotine. Nicotine inhales into the body makes the:
- a. heart beat faster
  - b. blood pressure rise
  - c. heart work harder
  - d. blood vessels constrict
  - e. all of the above
  - f. none of the above
  - g. don't know
18. When you quit smoking your risk of having a heart attack:
- a. soon falls below that of a non-smoker
  - b. is not changed
  - c. soon falls to that of a non-smoker
  - d. don't know
19. When you lose excess weight which of the following happens:
- a. cholesterol in the blood decreases
  - b. blood pressure decreases
  - c. work of the heart decreases
  - d. all of the above
  - e. none of the above
  - f. don't know
20. Many authorities consider high levels of emotional stress:
- a. an important cause of heart attack
  - b. a questionable cause of heart attack
  - c. not related to heart attack risk
  - d. don't know
21. Regarding resumption of sexual activity after a heart attack:
- a. most patients never have sex again
  - b. most patients return to a normal sex life after recovery
  - c. most patients have to greatly modify sexual activity
  - d. don't know

22. Circle "T" for TRUE or "F" for FALSE for each of the following statements about the medication Nitroglycerine which is frequently prescribed following heart attack.
- T F a. Nitroglycerine should be carried with you only if you have experienced recurring chest pain.
  - T F b. A bottle of Nitroglycerine remains fresh up to one year and need not be replaced sooner.
  - T F c. Nitroglycerine should relieve chest pain within 2 to 3 minutes after placed under the tongue.
  - T F d. A Nitroglycerine tablet should cause a little burning sensation when placed under the tongue.
  - T F e. Nitroglycerine frequently causes a headache when taken.
23. Chest pain (angina) means that:
- a. you are having a heart attack
  - b. the heart muscle is getting reduced oxygen supply for some reason
  - c. you have eaten too much acid food
  - d. don't know
24. If chest pain should occur after you have been discharged, the first thing you should do is:
- a. call your doctor immediately
  - b. immediately go to an emergency room
  - c. try a Nitroglycerine tablet under the tongue
  - d. don't know
25. The following symptoms are most commonly associated with the pain of heart attack:
- a. diarrhea and headache
  - b. fainting and pallor
  - c. coughing and difficulty talking
  - d. nausea, sweating, and shortness of breath
  - e. don't know

26. For which of the following should you notify your doctor or go to the nearest emergency room:

- a. fainting or "black out"
- b. a very slow or very fast heart rate
- c. chest pain which lasts longer than 15 minutes even though you have taken Nitroglycerine (one tablet every 5 minutes)
- d. all of the above
- e. don't know

27. In the space below name each of the prescribed medicines you take, how often you should take it, and what it does. If you do not know or cannot remember, please write that in the space.

- a. Name of medicine \_\_\_\_\_  
How often \_\_\_\_\_  
Purpose \_\_\_\_\_  
Side effects \_\_\_\_\_
- b. Name of medicine \_\_\_\_\_  
How often \_\_\_\_\_  
Purpose \_\_\_\_\_  
Side effects \_\_\_\_\_
- c. Name of medicine \_\_\_\_\_  
How often \_\_\_\_\_  
Purpose \_\_\_\_\_  
Side effects \_\_\_\_\_
- d. Name of medicine \_\_\_\_\_  
How often \_\_\_\_\_  
Purpose \_\_\_\_\_  
Side effects \_\_\_\_\_



## KNOWLEDGE QUESTIONNAIRE KEY

1. B
2. B
3. B
4. A
5. B
6. C
7. male, familial history stress, smoking, hypertension, sedentary life, hypercholesterolemia, overweight
8. B
9. B
10. C
11. B
12. A
13. 

a. does not increase	h. increases
b. does not increase	i. increases
c. does not increase	j. increases
d. increases	k. does not increase
e. does not increase	l. increases
f. increases	m. increases
g. does not increase	n. increases
14. B
15. C

- 16. B
- 17. E
- C
- 19. D
- 20. A or B
- 21. B
- 22. a. false
- b. false
- c. true
- d. true
- e. true
- 23. B
- 24. C
- 25. D
- 26. D
- 27. unscored

Scoring

Item 1-12 = 1 point each  
 Item 13, a-n =  $\frac{1}{4}$  point each  
 Item 14-21 = 1 point each  
 Item 22, a-e = 1 point each  
 Item 23-26 = 1 point each  
 Item 27 = unscored

## APPENDIX F

Hospital Permission to Conduct Study

TEXAS WOMAN'S UNIVERSITY

COLLEGE OF NURSING

Agency Permission for Conducting Study

The Baylor University Medical Center

GRANTS TO Reni Courtney  
(student)

enrolled in a program of nursing leading to a Doctor of  
Philosophy degree at Texas Woman's University, the privilege  
of its facilities in order to study the following problem:

Social Learning Theory and Convalescence of the Myocardial  
Infarction Patient

A. Shofner R.N.  
Signature of Agency Personnel

10-13-77  
Date

Reni Courtney  
Signature of Student

Anne Gudmundsen, Ph.D., R.N.  
Signature of Faculty Advisor

TEXAS WOMAN'S UNIVERSITY

COLLEGE OF NURSING

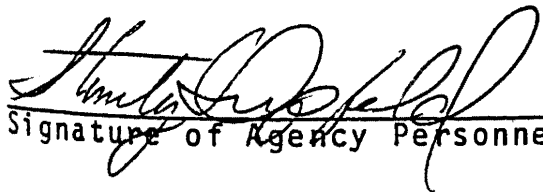
Agency Permission for Conducting Study

The ALL SAINTS EPISCOPAL HOSPITAL

GRANTS TO RENI COURTNEY  
(student)

enrolled in a program of nursing leading to a Doctor of  
Philosophy degree at Texas Woman's University, the privilege  
of its facilities in order to study the following problem:

Social Learning Theory and Convalescence of the Myocardial  
Infarction Patient

  
\_\_\_\_\_  
Signature of Agency Personnel

September 20, 1977  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Signature of Student

 Ph.D., R.N.  
\_\_\_\_\_  
Signature of Faculty Advisor

TEXAS WOMAN'S UNIVERSITY

COLLEGE OF NURSING

Agency Permission for Conducting Study

The Research Committee of St. Paul Hospital, Dallas, Texas

GRANTS TO Reni Courtney

(student)

enrolled in a program of nursing leading to a Doctor of Philosophy degree at Texas Woman's University, the privilege of its facilities in order to study the following problem:

Social Learning Theory and Convalescence of the Myocardial Infarction Patient

E.P. Jenevein M.D.

E.P. Jenevein, M.D., Chairman  
Signature of Agency Personnel

August 9, 1977

Date

Reni Courtney  
Signature of Student

Dr. Anne Sudmanson  
Signature of Faculty Advisor

TEXAS WOMAN'S UNIVERSITY

COLLEGE OF NURSING

Agency Permission for Conducting Study

The St. Joseph Hospital  
GRANTS TO Reni Courtney, R.N.  
(student)

enrolled in a program of nursing leading to a Doctor of  
Philosophy degree at Texas Woman's University, the privilege  
of its facilities in order to study the following problem:

Social Learning Theory and Convalescence of the Myocardial  
Infarction Patient

Mary Mulline  
Signature of Agency Personnel

7/29/77  
Date

R. Courtney  
Signature of Student

Dr. Anne Hedlundson  
Signature of Faculty Advisor

TEXAS WOMAN'S UNIVERSITY

COLLEGE OF NURSING

Agency Permission for Conducting Study

The HARRIS HOSPITAL

GRANTS TO RENI COURTNEY  
(student)

enrolled in a program of nursing leading to a Doctor of  
Philosophy degree at Texas Woman's University, the privilege  
of its facilities in order to study the following problem:

Social Learning Theory and Convalescence of the Myocardial  
Infarction Patient

*Ronald L. Smith*  
Signature of Agency Personnel

8/12/77  
Date

*Reni Courtney*  
Signature of Student

*Dr. Anne Gudmundson*  
Signature of Faculty Advisor



TEXAS WOMAN'S UNIVERSITY  
COLLEGE OF NURSING

Agency Permission for Conducting Study

The Methodist Hospitals of Dallas

GRANTS TO Reni Courtney

(student)

enrolled in a program of nursing leading to a Doctor of  
Philosophy degree at Texas Woman's University, the privilege  
of its facilities in order to study the following problem:

Social Learning Theory and Convalescence of the Myocardial  
Infarction Patient

G. Anne L. Mann  
Signature of Agency Personnel

Oct 3, 1977  
Date

R. Courtney  
Signature of Student

Anne Gudmundsen R.N. Ph.D.  
Signature of Faculty Advisor

## APPENDIX G

Written Permission from Physician

Sept. 10, 1977

Dear Dr.

In partial fulfillment of the requirements for a PhD degree from Texas Woman's University, I am conducting a study to determine behavior patterns of the convalescing myocardial infarction patient. I am planning the administration of research questionnaires to a patient a few days before his hospital discharge. My study has been approved by the \_\_\_\_\_ Hospital Research Committee.

It is expected that this study will facilitate understanding of the psychosocial adjustment of the convalescing infarction patient, as well as the early prediction of those patients at high risk for poor psychosocial recovery. This kind of knowledge can be used in the future to develop more effective rehabilitation efforts.

I request permission to include several of your uncomplicated myocardial infarction patients in the study. If you agree, please sign below and return this letter in the envelope provided.

Thank you for your cooperation. If you are interested in the study findings I will be happy to share them with you when they are available.

Sincerely,

Reni Courtney R.N., M.S.

---

Physician Signature

## APPENDIX H

### Patient Consent Forms

## TEXAS WOMAN'S UNIVERSITY

(Form A -- Written presentation to subject)

Consent to Act as a Subject for Research and Investigation:

(The following information is to be read to or read by the subject);

1. I hereby authorize Maureen R. Courtney, R.N.  
 (Name of person(s) who will perform  
 procedure(s) or investigation(s))

to perform the following procedure(s) or investigation(s):  
 (Describe in detail)

I am being asked to participate in a study which is designed to help nurses and other health professionals better understand how patients do after having a heart problem. I am being asked to complete two questionnaires and three scales which are designed to obtain information about how I feel and what I understand about my illness. I am being asked to complete these forms during my hospitalization. It has been explained to me that this information will help provide the basis for better cardiac rehabilitation efforts in the future.

I understand that the information I give will be strictly confidential and will be coded by a number--not by my name. This information will be in the hands of the researcher at all times. I also understand that my physician and this hospital have given their permission for this study to be conducted.

2. The procedure or investigation listed in Paragraph 1 has been explained to me by Maureen R. Courtney.  
 (Name)
3. I understand that the procedures or investigations described in Paragraph 1 involve the following possible risks or discomforts:  
 (Describe in detail)

There is no anticipated risk for any subject in this study.

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(Form A - continuation)

3. I understand that the procedures and investigations described in Paragraph 1 have the following potential benefits to myself and/or others:

Efforts to assist a patient to recover fully from a cardiac illness can be made more appropriate if nurses and physicians better understand what convalescence is really like for the patient. My participation in this study will help health professionals to better understand the recovery process so that they may provide better services to future patients like myself.

4. An offer to answer all of my questions regarding the study has been made. If alternative procedures are more advantageous to me, they have been explained. I understand that I may terminate my participation in the study at any time.

---

Subject's signature

---

Date

APPENDIX I

MEDICAL RECORD SUMMARY FORM

MEDICAL RECORD SUMMARY FORM

CODE NO. \_\_\_\_\_

HEIGHT/WEIGHT

<u>PREVIOUS MEDICAL HISTORY</u>		<u>PREVIOUS CARDIAC HISTORY</u>	
<u>DATE</u>	<u>PROBLEM</u>	<u>DATE</u>	<u>PROBLEM</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Arrhythmia--        Yes        NoTreatment:                                  med.                                 pacer                                 otherPain after first 24 hours:MED.       Yes        No
                                 kind  
                                 amt  
                                 freq.
Enzymes
Date      CPK      SCOT      LDH



CURRENT DIET

### CURRENT ACTIVITY

## NORRIS INDEX

## TOTAL SCORE

Factor						X	Y
Age (yr.) ( $X_2, Y_1$ ):							
50	..	..	..	..	..	0-2	
50-59	..	..	..	..	..	0-4	
60-69	..	..	..	..	..	0-6	3.9
70-79	..	..	..	..	..	0-8	
80-89	..	..	..	..	..	1-0	
Position of infarct ( $X_1, Y_1$ ):							
Anterior transmural	..	..	..	..	..	1-0	
Left bundle-branch block	..	..	..	..	..	1-0	
Posterior transmural	..	..	..	..	..	0-7	2.8
Anterior subendocardial	..	..	..	..	..	0-3	
Posterior subendocardial	..	..	..	..	..	0-3	
Admission systolic blood pressure (mm.HG)							
( $X_1, Y_1$ ):							
55	..	..	..	..	..	1-0	
55-64	..	..	..	..	..	0-7	
65-74	..	..	..	..	..	0-6	
75-84	..	..	..	..	..	0-5	
85-94	..	..	..	..	..	0-4	10.0
95-104	..	..	..	..	..	0-3	
105-114	..	..	..	..	..	0-2	
115-124	..	..	..	..	..	0-1	
125	..	..	..	..	..	0	
Heart size ( $X_1, Y_1$ ):							
Normal	..	..	..	..	..	0	
Doubtfully enlarged	..	..	..	..	..	0-5	1.5
Definitely enlarged	..	..	..	..	..	1-0	
Lung fields ( $X_1, Y_1$ ):							
Normal	..	..	..	..	..	0	
Venous congestion	..	..	..	..	..	0-3	
Interstitial edema	..	..	..	..	..	0-6	3.3
Pulmonary edema	..	..	..	..	..	1-0	
Previous ischemia ( $X_1, Y_1$ ):							
No ischemia	..	..	..	..	..	0	
Previous angina or infarction	..	..	..	..	..	1	0.4

## APPENDIX J

### Raw Data

## RAW DATA

KEY: Sex

- 1 = male
- 2 = female

Race

- 1 = white
- 2 = black
- 3 = latin
- 4 = other

Marital Status

- 1 = married
- 2 = widowed
- 3 = single
- 4 = divorced
- 5 = separated

Family Structure

- 1 = children and spouse
- 2 = others in home
- 3 = spouse only
- 4 = alone

Prior Cardiac History

- 1 = positive history
- 2 = negative history

Incidence of MI

- 1 = first
- 2 = second

Prior Health Status

- 1 = negative medical history
- 2 = acute history
- 3 = chronic history
- 4 = acute and chronic history

## RAW DATA (Continued)

KEY: Arrhythmia

1 = yes

2 = no

Pain

1 = yes

2 = no

Perception of Situation

1 = strong skill

2 = slight skill

3 = slight chance

4 = strong chance

I.D. Number	Hospital	Age	Sex	Race	Marital Status	Family Structure	Education Years Completed	Hollingshead Index	Severity of MI	Prior Cardiac History	Incidence of MI	Prior Health Status	Days in CCU	Days in Hospital
001	1	39	1	1	3	4	15	3	04.24	2	1	4	04	06
002	1	64	1	1	1	3	12	3	06.89	2	1	4	03	10
003	2	59	1	1	1	3	12	3	02.80	1	2	1	03	10
004	3	48	2	2	1	1	10	4	03.98	1	1	2	04	16
005	2	68	1	1	1	3	08	4	04.70	2	1	3	04	14
006	2	54	2	1	2	4	08	5	08.81	1	1	1	03	09
007	1	55	1	1	2	1	12	3	04.36	2	1	2	04	11
008	2	40	1	1	1	1	11	4	03.14	2	1	3	04	08
009	1	48	1	1	1	3	15	3	03.73	2	1	4	02	08
010	1	45	1	1	1	1	14	3	07.63	2	1	1	06	17
011	3	54	1	1	1	3	12	4	03.92	1	1	4	06	28
012	3	44	1	1	1	1	12	3	07.75	1	2	2		10
013	1	51	1	1	1	1	12	3	04.51	2	1	1		13
014	2	67	1	1	1	3	07	2	07.52	1	2	4	07	12
015	2	56	1	1	1	3	12	4	09.76	1	2	3	02	12
016	1	55	1	1	4	2	12	4	03.52	2	1	1	03	10
017	1	45	1	1	1	1	13	3	04.48	2	1	2	04	13
018	3	60	1	1	1	3	12	3	03.91	2	1	4	03	12
019	1	57	2	1	1	3	10	4	05.92	2	1	1	03	12
020	5	62	1	1	1	3	07	3	04.30	2	1	4	10	16
021	1	51	1	1	1	3	10	4	04.27	2	1	1	03	10
022	2	63	1	1	1	3	10	4	08.14	2	1	3	04	08
023	2	35	1	1	1	4	10	4	06.98	1	1	1	04	07
024	2	51	1	1	1	3	14	3	03.39	2	1	3	04	13
025	6	66	1	1	1	3	11	4	04.30	2	1	3	05	10
026	3	55	1	1	1	3	13	3	03.52	2	1	2	06	13
027	5	63	1	1	1	3	09	4	08.35	1	1	1	08	16
028	5	60	2	1	3	4	09	4	05.05	2	1	4	05	34
029	1	47	1	2	1	1	11	4	03.58	2	1	3		15
030	4	56	1	1	1	1	12	3	08.81	1	2	2	03	20
031	3	40	1	1	1	1	12	4	05.98	1	2	2	07	16
032	4	55	1	1	1	3	19	1	05.35	2	1	2	04	12
033	4	45	1	1	1	1	17	1	03.14	1	1	4	05	18
034	2	64	2	1	2	4	10	4	10.05	2	1	2	03	12
035	2	64	1	1	1	1	16	2	04.70	1	2	4	06	13

Arrhythmia	Pain	I-E Score	HLC Score	EHLC Score	IHLC Score	Perception of Situation	Health Value Score	Anxiety Score	Depression Score	Denial I Score	Knowledge Score	Information Seeking I	Information Seeking II	Perception of Health Status
2	2	06	32	16	16	1	13	09	06	1	25	3	5	09
2	2	03	41	27	14	1	15	03	05	3	25	4	6	07
2	2	05	24	16	07	1	09	01	10	1	13	1	1	06
1	1	15	30	16	14	2	05	08	18	1	06	2	9	09
2	1	04	24	13	11	2	07	08	16	1	13	1	5	11
1	2	16	39	25	14		15	16	23	1	05	3	0	11
2	2	07	42	25	17	1	01	03	10	1	24	2	5	10
1	1	06	48	25	23	1	10	12	23	1	35	3	2	15
2	2	10	39	26	13	1	12	11	19	1	12	0	9	05
1	1	09	45	33	12	1	13	03	10	1	19	3	9	12
1	1	04	31	21	10	2	12	10	14	1	31	2	3	15
2	2	11	41	20	21	2	12	06	11	1	26	3	5	09
2	2	08	26	17	09	1	10	04	02	1	25	2	8	05
1	1	09	32	22	10	1	09	09	15	1	20	3	2	09
1	2	07	39	20	19	1	10	11	20	1	22	1	2	13
2	2	08	53	31	22	1	10	01	02	1	13	1	9	06
2	1	09	22	14	08	1	03	13	19	1	23	2	5	11
2	2	10	51	34	17	1	10	01	03	1	21	2	6	08
2	2	03	30	10	20	1	13	09	16	1	07	3	1	07
1	2	11	35	28	07	1	12	00	06	1	26	1	7	06
2	1	18	61	36	25	1	13	03	07	1	12	2	3	08
1	1	06	43	23	20		05	03	11	1	15	0	7	11
2	2	04	34	17	17	2	06	12	24	1	24	2	2	07
2	2	13	34	18	16	2	16	16	23	1	06	0	5	14
1	2	05	37	21	16	1	08	05	10	1	00	2	0	07
1	1	13	39	22	17	2	04	08	26	1	00	3	2	08
1	2	07	39	30	09	1	05	02	11	1	17	2	3	
1	1	04	29	16	13	1	15	10	19	1	20	0	6	08
2	2	11	33	14	19	1	19	05	12	1	25	1	7	12
1	2	05	33	15	18	1	21	08	16	1	30	4	0	11
1	2	05	35	21	14	2	05	04	16	1	26	2	0	14
2	2	11	48	28	20	1	15	06	14	1	32	4	2	09
2	2	02	30	18	12	1	19	00	10	1	21	1	8	08
1	1	11	35	19	16	3	04	11	20	1	12	3	3	11
1	2	03	27	13	14	2	09	07	17	1	21	1	5	08

I.D. Number	Hospital	Age	Sex	Race	Marital Status	Family Structure	Education Years Completed	Hollingshead Index	Severity of MI	Prior Cardiac History	Incidence of MI	Prior Health Status	Days in CCU	Days in Hospital
035	2	64	1	1	1	1	16	2	04.70	1	2	4	06	13
037	6	46	1	1	5	4	12	3	07.14	1	2	2	05	09
038	6	47	1	1	1	1	16	1	02.74	2	1	1	07	14
039	4	56	1	1	1	1	12	3	04.27	2	1	4	03	13
041	4	70	2	1	3	2	15	3	04.36	1	2	2	07	24
042	5	62	1	1	1	1	16	3	05.54	1	1	4	05	15
043	6	50	1	1	1	1	16	1	03.52	2	1	1	05	12
044	1	67	2	1	3	4	09	4	04.30	2	1	3	02	15
045	3	58	1	1	1	3	12	3	03.52	2	1	3	04	09
046	2	41	2	1	1	1	13	3	02.74	2	1	1	03	12
047	5	31	1	1	1	1	12	4	02.74	2	1	2	04	13
048	4	34	1	1	3	2	16	1	02.74	2	1	3	05	14
049	4	44	1	1	1	1	10	4	05.47	1	2	4	04	24
050	4	61	1	1	1	3	12	4	06.13	2	1	1	05	13
052	3	59	2	1	1	3	12	5	03.52	2	1	1	05	13
053	6	58	2	1	1	3	12	2	04.26	2	1	4	05	15
054	2	52	1	1	1	1	16	2	03.52	2	1	3	04	11
055	2	70	1	1	1	3	08	4	04.36	1	2	4	04	10
056	2	51	1	1	1	3	15	2	04.92	1	1	2	03	08
057	5	67	1	1	1	3	12	3	12.28	2	1	2	04	20
058	5	70	1	1	4	4	06	4	05.08	2	1	4	04	14
060	4	59	1	1	3	4	16	2	03.52	2	1	2	02	14
061	4	49	1	1	1	1	12	4	02.74	2	1	2	03	15
063	3	39	1	1	1	1	13	2	04.08	2	1	3	06	15
064	3	67	1	1	1	3	12	4	06.13	2	1	3	03	13
066	4	55	1	1	1	3	12	4	03.52	2	1	3	05	14
067	4	61	1	1	1	3	16	2	04.30	2	1	1	03	17
068	4	61	1	1	1	3	14	3	04.30	2	1	2	05	13
071	4	38	1	2	1	1	12	4	03.58	2	1	4	06	14
072	5	62	1	1	1	3	12	3	04.30	1	1	4	03	20
073	5	53	1	1	1	3	12	4	06.92	1	1	2	04	16
075	3	66	1	1	4	4	12	3	05.14	2	1	4	03	14
076	4	55	1	1	1	3	10	3	06.34	2	1	1	07	17
077	1	50	1	1	1	1	13	3	03.52	2	1	1	04	11
078	6	58	1	1	1	1	16	1	04.36	2	1	2	04	10



Arteriosclerosis	Pain	I-E Score	HLC Score	EHLC Score	IHLC Score	Perception of Situation	Health Value Score	Anxiety Score	Depression Score	Denial I Score	Knowledge Score	Information Seeking I	Information Seeking II	Perception of Health Status
1	2	03	27	13	14	2	09	07	17	1	21	1	5	08
1	1	01	23	15	08	1	19	18	32	1	26	3	8	15
1	1	03	30	12	18	1	07	08	14	1	21	1	6	08
1	1	05	45	23	22	1	07	08	15	1	21	0	9	06
1	2	08	41	26	25	2	13	01	15	1	13	4	4	10
1	2	09	38	23	15	2	11	15	23	1	32	3	7	12
1	2	05	21	15	06	1	10	01	01	1	18	0	8	07
2	1	11	38	24	14	2	13	08	17	1	01	0	3	10
1	2	03	26	16	10	1	15	07	16	1	29	3	3	11
2	1	06	33	16	17	1	11	10	19	1	21	2	0	06
1	1	09	27	15	12	1	07	09	18	1	17	1	7	07
2	1	10	43	26	17	2	05	15	26	1	26	3	3	13
2	1	08	47	22	25	1	16	12	27	1	29	0	4	10
1	1	10	33	20	13	1	08	13	18	1	16	5	2	07
1	2	05	34	18	16	4	11	08	21	1	24	2	6	11
1	2	08	39	24	15	2	14	13	24	1	29	3	9	16
2	2	06	40	26	14	2	12	14	19	1	18	2	5	15
1	1	13	44	22	22	2	03	07	13	1	18	3	3	12
2	2	09	32	16	16	2	06	08	14	1	20	1	5	06
1	2	04	32	14	18	1	15	09	18	1	11	0	0	06
1	1	13	42	29	13	1	00	03	12	1	15	0	3	07
2	2	03	36	22	14	1	09	02	11	1	10	1	5	05
2	1	12	49	33	16	1	06	13	21	1	00	1	5	16
2	1	04	26	11	15	1	04	07	12	1	26	3	9	11
1	2	05	43	33	10	1	06	06	16	1	25	3	0	09
1	2	03	38	24	14	1	14	09	16	1	22	0	9	13
2	2	06	37	15	22	1	03	05	07	3	15	0	0	05
2	2		40	20	20	2	13			1		1	4	07
1	1	14	38	28	10	2	07	04	06	1	13	1	6	09
1	2	04	32	17	15	1	15	00	05	1	14	1	7	11
1	2	04	31	16	15	1	06	12	19	1	20	0	2	09
1	2	11	46	26	20	2	07	04	15	1	10	5	7	10
1	2	08	34	24	10	1	10	11	21	1	23	3	3	
1	2	05	20	13	07	1	15	01	05	3	26	2	7	05
1	2	07	31	15	16	1	13	07	19	1	24	3	4	06

I.D. Number	Hospital	Age	Sex	Race	Marital Status	Family Structure	Education Years Completed	Hollingshead Index	Severity of MI	Prior Cardiac History	Incidence of MI	Prior Health Status	Days in CCU	Days in Hospital
079	2	57	1	1	3	4	12	3	02.40	1	1	3	03	10
080	4	60	1	1	1	3	13	3	08.54	1	2	4	05	14
081	4	65	2	1	1	3	08	3	06.88	2	1	4	03	23
082	3	45	1	3	1	1	12	3	03.73	2	1	4	05	16
083	4	52	1	1	1	1	12	3	07.52	2	1	1	04	10
084	3	43	1	1	1	1	14	2	03.74	2	1	2	04	09
085	1	50	1	1	1	1	10	3	05.26	2	1	1	05	14
087	6	64	1	1	1	3	16	2	04.30	2	1	1	04	10
088	4	57	1	1	1	3	16	1	03.92	1	2	2	03	14
089	5	65	1	1	1	3	12	3	03.58	2	1	1	06	16
091	2	59	1	1	1	3	06	4	07.36	2	1	3	04	11
092	2	45	1	1	4	1	12	3	02.74	2	1	1	03	09
094	3	66	1	2	1	3	08	4	07.04	1	2	2	05	15
095	6	70	1	1	4	4	12	3	05.08	2	1	2	05	15
096	2	63	1	1	1	3	12	3	07.70	1	1	2	05	13

Raw Data

Arrhythmia	Pain	I-E Score	HLC Score	EHLC Score	IHLC Score	Perception of Situation	Health Value Score	Anxiety Score	Depression Score	Denial I Score	Knowledge Score	Information Seeking I	Information Seeking II	Perception of Health Status
2	2	14	54	29	25	1	14	11	15		20	1	3	
1	2	11	37	23	14	1	12	03	07	1	26	3	2	12
1	2	04	21	14	07	1	07	00	05	1	26	1	4	11
1	1	09	34	21	13	3	03	10	10	1	27	0	9	12
1	2	05	29	12	17	1	08	02	07	1	28	3	5	05
1	2	08	39	16	23	2	13	11	18	1	31	5	2	07
1	1	03	26	17	09	1	08	10	14	2	24	1	7	10
1	2	05	30	18	12	1	04	12	20	1	24	3	2	10
3	1	01	17	08	09	1	13	06	19	1	25	4	3	13
1	1	05	44	23	21	1	08	04	09	1	21	3	9	08
1	2	11	40	29	11	1	11	06	18	1	17	4	1	13
1	2	10	22	09	13	2	03	11	06	1	27	0	0	08
2	2	10	11	06	05	1	11	03	05	1	06	0	6	14
1	2	09	36	23	13	1	12	09	18	1	06	1	1	12
2	2	04	20	09	11			06	16	1	26	2		

Raw Data

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