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INTERNAL-EXTERNAL LOCUS OF CONTROL AND RECOVERY FROM ORTHOPEDIC SURGERY.

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THE UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

INTERNAL-EXTERNAL LOCUS OF CONTROL AND RECOVERY FROM ORTHOPEDIC SURGERY

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

DOCTOR OF PHILOSOPHY

BY

BILLY ULYSES PHILIPS, JR.

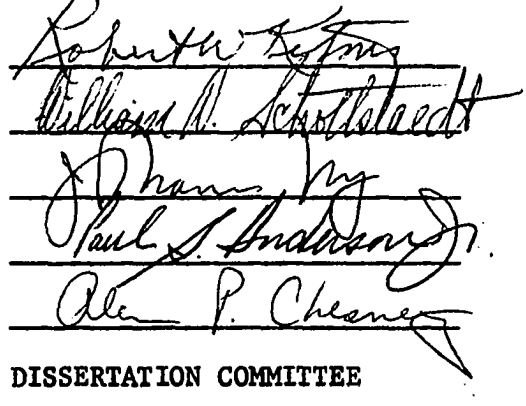
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1974

INTERNAL-EXTERNAL LOCUS OF CONTROL AND RECOVERY

FROM ORTHOPEDIC SURGERY

APPROVED BY



DISSERTATION COMMITTEE

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INTERNAL-EXTERNAL LOCUS OF CONTROL AND RECOVERY FROM ORTHOPEDIC SURGERY

CHAPTER I

INTRODUCTION

The literature regarding the factors that influence recovery from surgery has grown steadily over the years. A number of investigators, representing primarily the behavioral sciences, have contributed to the understanding of psychological response and adaptation to medical and surgical procedures (Abram, 1973). Some researchers have emphasized the importance of the situational determinants of behavior (Farber, 1964; Mischel, 1968) while others have stressed a trait psychology or intrapsychic approach (Bem, 1972). Bowers (1973) has suggested "that both the trait and the situationists positions are inaccurate and misleading and that a position stressing the interaction of the person and the situation is both conceptually satisfying and empirically warranted." Janis (1958) supports this contention in his study of the psychological stress of surgery. He found that the intensity of preoperative fear in patients anticipating surgery was not correlated substantially with the objective seriousness of the operation. Rather, the patient's response suggested mediation by psychological and situational variables.

Purpose of the Study

The purpose of this investigation is to: (1) determine if there is a relationship between the personality dimension of internal-external control (Rotter, 1966) and the recovery of the orthopedic surgery patient; (2) describe the degree of the relationship; (3) study the parameters of the relationship toward the development of a profile that will integrate the psychological and situation variables; (4) describe the degree of the relationship to each parameter; and (5) suggest ways in which the results of this study can improve total patient care.

Significance of the Study

In the past decade surgery has become a highly utilized and effective prescription occupying a position of high prestige among members of the medical profession and the public. To the behavioral scientist, the surgical experience offers an unique area for investigation.

Traditionally, behavioral scientists have limited their investigations of surgery to the psychosomatic aspects of the experience (Ficarra, 1951; Cantor and Foxe, 1956). However, recent studies have focused on factors which affect the process of recovery from surgery such as variables which mediate the patient's response to the psychological ambiguity of the situation, the risks of death and mutilation, physical pain and discomfort, and the relative social isolation of the hospitalization (Kutner, 1958). While physical trauma is significant to patient care following surgery, studies of psycho-social trauma in the post-operative course of surgical recovery are needed if total patient care is to be improved.

Kutner (1958) has stated, "since human beings respond variably to life crises, it is to be expected that responses to surgery should not be homogeneous." Simmons (1956) has discussed this variability of response as follows: "Patients sometime jump the gun in their specific responses to surgery often recovering without therapy or in spite of it." Paradoxically, patients may also suffer severe complications or die from a commonly routine procedure in just as inexplicable a fashion as those who recover. Yet, it is the behavioral science orientation that human behavior is predictable and follows patterns that may be understood and manipulated (Schwab, 1971). It is the objective of this research to contribute to the understanding of recovery as it is effected by the patient's perceptions of control in the framework of surgery and hospitalization and thus contribute to the improvement of total patient care. However, future research in this area warrants a broader, more ecological prospective which will integrate the variety of factors which impinge upon recovery. The ecological approach may offer more appropriate response to Simmons (1956) and Schwab (1971).

CHAPTER II

REVIEW OF LITERATURE

Overview

The intent of this literature review is to establish the proposition that the personality dimension of internal-external control (Rotter, 1966) is an antecedent variable which modifies patients' responses to other factors in the surgical recovery process. This review is oriented toward establishing a temporal, theoretical, and empirical perspective from which to understand the evolution of the topic. Key elements of the topic include signal anxiety and the models of patient response; personality dimensions of coping style and locus of control and their relationship to surgical recovery. It will be clear to the reader that this review reflects the topic and area of study, the psychology of recovery. It is recognized that behavior within the context of surgery and hospitalization is a result of variables other than those of a psychological nature. However, integration of the social, cultural, and other factors germane to the topic will be limited to discussion as they are modified by the control dimension and related to the surgical recovery process.

Signal Anxiety: Arousal of Ego Defense for Recovery

Among the earliest contributions toward understanding the

surgical experience and the associated process of recovery are those made in the psychoanalytic literature. Freud (1955) theorized that the anxiety associated with impending traumatic events is an important signal mechanism for the implementation of ego defenses. Expanding upon Freud's thesis, Deutsch (1942) identified and addressed four major areas of variables related to the psychic reaction of patients to surgery: the psychology of the individual, his neurosis and antecedent psychic situation; the meaning of the operation, including the patient's relationship to the diseased organ both in reality and symbolically, the anesthesia, and the surgical attack; the postoperative reaction; and the patient-surgeon relationship. However, Deutsch's primary contention revolves around the importance of the signal anxiety mechanism in ameliorating the shock of the surgical experience.

> It is not the freedom from anxiety or its presence before an operation which gives favorable prognosis, but the inner assimilation of the anxiety signal which arises in the patient who expects an operation; its goal is the building up of inner defenses (Deutsch, 1942, p. 284).

Grinker suggests that:

> The signal threshold is related to ego strength and sensitivity which is partly constitutional and partly learned...cued off in current time by appropriate meaningful stimuli...serving a boundary function for the maintenance of the individual (Grinker, 1959, p. 108/540).

Two theoretical frameworks of surgical recovery have evolved based on this premise: the "emotional drive" model (Miller and Dollard, 1941; Mowrer, 1956) and the "parallel response" model proposed by Leventhal (1970).

Recovery and Emotional Drive

The "emotional drive" model posits that the assimilation of

the anxiety signal causes adaptive behavior. Several longitudinal studies examine this point. Titchener and Levine (1960) observed that a moderate amount of anxiety and worry prior to surgery, rather than extreme anxiety or its total absence, are most conducive both to good post-operative emotional adjustment and good post-operative surgical recovery. Marmor (1958) relates that anxiety and worry prior to surgery serve to stimulate a cycle called the "work of worry." He notes, in addition that "fear must be of moderate intensity and situationally rather than neurotically determined." Janis (1958) has reported similar results from pre-operative and post-operative interviews with 22 surgical patients, but adds that recovery is also related to the patient's capacity to discharge anxiety. He found those patients displaying moderate anticipatory fear of a situational nature had healthy personality structures and uneventful surgical recoveries. Patients with low levels of pre-operative fear displayed resentment, distrust, anger, aggression, and criticism of hospital staff. Patients with high levels of pre-operative fear displayed prolonged overt neurotic anxiety and tended to have more post-operative levels of anxiety due to lack of information or denial of threat result in post-operative emotional disturbances which are often discharged on the hospital staff. This generally occurs when the patient faces post-operative distress. High pre-operative levels of anxiety probably stimulate the "work of worry," but due to the patient's neurosis channel the worry around antecedent childhood threats which are dysfunctional to the surgical experience and recovery. In summary, the emotional drive theory predicts a curvilinear relationship between the level of pre-operative fear and post-operative adjustment.

Recovery and the Model of Parallel Response

The "parallel response" model arose as a result of non-replicating experimental studies designed to validate Janis' (1958) work. This model proposes that anxiety is a response rather than a drive that is a product of the individual's appraisals of the hospital environment and situation surrounding surgery. Leventhal (1963) first reported evidence which suggested linear relationships between patients' low pre-operative fear, low post-operative distress and their favorable post-operative evaluation of the medical staff. He identified 11 measures of pre-operative emotionality which are important in understanding post-operative adjustment. This finding has important implication to the reactive or definition component in recovery.

Reactive Components of Recovery

"It has long been recognized that difficult life circumstances ..., stress situations, lead to varied physiological and social responses. It is believed that these differences are due to subject's differing definitions and capacities to cope with these stimuli..." (Mechanic, 1968, p. 127). Research that aims to relate the reactive or definitional components in the psycho-physiology of stress to surgical recovery is being developed. Noted authors (Cannon, 1929; Selye, 1950; Lazarus, 1966) have examined the relationship of stress, pathogenic emotions, and alteration of physiological function related to the facilitation of illness and to some extent recovery and are excellent review sources. However, it is not the purpose of this review to document the extensive literature in this area, but rather to orient closely to documentation

that focuses on the recovery process of hospitalized surgical patients. Due to the infancy of this area of research, a limited amount of non-surgically related data must be employed to establish the theory base. Research efforts have taken the general approach of examining the reactive component of recovery investigating personality coping styles and patient preparation.

Coping Styles

Coleman (1969) has pointed out, "an individual under serious stress has two problems: to meet the adjustive demand and to defend himself from the stress." The particular cognitive structure of the individual which disposes him to interpretation of situations in particular ways is a basic part of the individuals' coping style. Lazarus (1966) has noted "that the emphasis on the cognitive determination of coping does not imply that secondary appraisal and the coping process are conscious, rational or adaptive, but only that beliefs, expectations, preceptions, and evaluations underlie what the individual chooses to do." Haan (1963) has attempted to clarify by suggesting that "...the mental processes involved in the various coping mechanisms and the classical defense mechanisms are identical." Certain stable underlying attributes of the psychological processes involved favor the use of particular defenses. These dispositional coping styles relate to the tendency of the individual to view, think and act toward the world from a personally functional orientation (Klein, 1958). Holzman and Gardener (1959) hold that coping styles serve to reinforce the use of the individual's particular psychological mechanisms which in turn reinforce the continued use of the coping style.

Personality theorists (Byrne, 1961, 1964; Gardener, et al., 1959; Goldstein, 1959) recognized a number of coping styles that generally occur between the two behavioral extremes of avoidance; an essentially passive approach to conflict resolution; and vigilance, a more active, encounter oriented approach. Other theorists have categorized coping styles according to the psychological processes that each represents, namely, repression-sensitization, repression-isolation, and avoidance-coping. Surgical patients whose coping style is passive, repressive or avoidant, usually employ denial and restrict expression of stress. Those who cope by employing an active orientation, sensitization or isolation, attempt to limit stress by understanding its origin and attempting to exercise control over it. Each style is important to the way a patient manages the stressful events of the surgical experience which in turn affect recovery.

Patient Preparation Coping Style and Recovery

A number of clinicians as well as researchers have attested to the importance of psychological preparation of the patient for surgery in ameliorating post-operative anxiety, pain, and uncooperativeness (Kaufman, 1956). Egbert, et al.(1964) found that patients given instruction, suggestion, and encouragement about controlling post-operative pain: (1) exhibited a reduced need for post-operative narcotics; (2) were more comfortable and in better physical and emotional condition as judged by an independent observer; and (3) returned home over two and one-half days earlier than a control group. Johnson (1966) compared the post-operative distress of patients forewarned about post-operative

discomforts with a control group that received no information. Again, the prepared patients were discharged earlier than controls. Essential to the interpretation of these findings is an investigation of the relative effects of information as it is mediated by the patient's coping style.

Andrew (1970) studied the relationship between preparation, coping styles and surgical recovery. In a study of stress-reduction by information-giving in three coping styles it was found: (1) sensitizers (patients who typically seek, learn and use information in their coping style) exhibited no change on the recovery variables; (2) avoiders required more pain medication though the length of their hospitalization did not differ from the other groups; and (3) a neutral group recovered in less time than expected and required fewer pain medications. In discussing these unexpected results, Andrew noted that instruction appeared to be detrimental to the avoidance group, served as an adaptational stimulus to the neutrals, and was ineffective in the sensitizers.

Similar results were reported by Cohen and Lazarus (1973) in a study designed to determine if certain coping processes may be more useful for facilitating good recovery. It was hypothesized that vigilant patients, i.e., users of information in the coping process, would have better recoveries than avoidant patients. However, it was found that the alternative hypothesis was supported. The vigilant group, patients who knew most about their surgery, had more minor complications and longer hospitalization than the more passive, less informed group.

These findings initially suggest rejection of the hypothesis that active coping style is related to preparatory information. A more

thorough analysis, however, suggest an interpretation of the relationship as it is mediated by the nature of the information, the constraints of the situation on the patient's response options, and the patient's coping style. Therefore, applying this analysis to Andrew (1970) it is apparent: (1) patients were classified according to their dispositional coping style rather than the coping style exhibited in the situation; and (2) prepared with descriptive material which informed the patient about how to act. Therefore, the group that benefited most from the information was the group that learned poorly the "most threatening" material, since active response options were limited. Cohen and Lazarus (1973) explain further, "...we view vigilant copers as individuals who were using a strategy of actively trying to master the world by seeking information and trying to learn everything about their operation. In the post-operative hospital context, however, with its incapacitation and pain, they cannot master the situation actively as they would wish, but are forced to be dependent and passive." Johnson, et al. (1971) differentiates patient response options as (1) emotional - fear reactions (anxiety, depression, complaining) or (2) instrumental - attempts to influence the situation (walking, turning, coughing). Joint products of the patient's appraisal of the threat situation, these responses form two classes which tend to be internally consistent with the patient's coping style. Yet each, in its manner, is an attempt to control the situation or its effect. Mandler (1968) suggests, "whenever the organism is not able to draw upon some behavior or act that controls his environment...he will be in a state of anxiety." Thus, it appears likely that the degree to which a person sees himself as able to control various

aspects of his world is a central aspect in defining coping style and should be related to recovery.

Locus of Control and Coping Style

The personality dimension of internal-external control is a valuable device for integrating diverse research data and predicting a wide range of selected behaviors (Lefcourt, 1964). The need for a mechanism for assessing the control dimension related to the coping styles which influence surgical recovery is apparent, especially, in differentiating patient's predisposition to emotional reactions and predispositions to initiate action to influence the environment of their recovery, the hospital and staff.

The extent to which patients believe they can influence what happens to them can be assessed by Rotter's (1966) scale of internal-external control of reinforcement. Expectancies of reinforcement form two categories of perceived control. "Internal control," a high scale score, reflects perception that an event is contingent upon one's own behavior, action, skill, effort or permanent characteristics. "External control," a low scale score, reflects perception that an event has no relationship to personal action or experience; outcomes are unpredictable because of the great complexity of forces such as luck, chance, fate, or are under the control of "powerful others."

Rotter (1966) has:

> hypothesized that this variable is of major significance in understanding the nature of learning processes in different kinds of learning situations and also that consistent individual differences exist among individuals in the degree to which they are likely to attribute personal control to reward in the same situation (p. 1).

Merton (1946) suggests construct validity of internal-external control

with active-vigilant coping style and passive-avoidant coping style. He suggests the defensive behaviors attempt, "to serve the psychological function of enabling people to preserve their self-esteem in the face of failure." Relating to the passive coping style, he states, "it may also, in some individuals, act to curtail sustained endeavor."

McClelland, et al. (1953) and Atkinson (1958) have added that individuals with high achievement needs have some belief in their abilities to fulfill their needs and solve problems which confront them.

Boyd, et al. (1973) in a prospective study of personality styles in the post-operative course reported that the most significant variable to effect post-operative recovery was the style from which patients coped with stress. Relating personality profiles to post-operative adjustment groups, the poor group, "continued in a blandly passive, evasive manner. Their obsequious and complaining postures toward the surgeon disclosed a typical preconscious, hostile, passive-dependent character stance." On the other hand, the good group were "productive and effective if not always fulfilled. Their concerns were with loss of effectiveness. As a group, they had suffered meaningful losses which had been dealt with immediately, ...they had low tolerance for the ambiguous and tenuous."

In a somewhat different context, Phares (1962) studied a non-patient sample on chance versus skill controlled situations and the coping process. It was concluded that subjects who feel in control of a situation exhibit perceptual behavior that will better enable them to cope with potentially threatening situations than subjects who are chance oriented.

Locus of Control - Hospitalization and Recovery

The experience of hospitalization for surgery contributes a situational dimension to the recovery process. Simmons (1956) has offered the following characterization, "The modern hospital, as an institution, has created for itself a culture that is in sharp contrast ...the threshold of the hospital has become a significant dividing line between two different ways of life." Goffman (1961) relates this result to the objective, "handling of many human needs by the brueaucratic organization..." Implicit within these analyses is an essential question about the nature of institutionalization as it relates to coping style and ultimately recovery. Taylor (1969) has amplified this contention identifying the hospital as the purveyor of a "cult of efficiency, ...a comment on the curious way in which our health systems...reduce patients to an inferior status."

The question of conformity to social expectation within the hospital has been addressed by Tagliacozzo and Mauksch (1972). Building on Merton (1957), they have suggested using a role-set theory in a hospital application. In a study of how patients view their role in the hospital it is suggested that, "behavior must be placed into the context of organizational process if it is to encompass realistic orientation and behavior display." An additional component, however, discusses how the patient relates to the system surrounding him, "the relatively isolated patient in the modern single or double hospital room is frequently left to his own devices in coping with differences in real and perceived expectations." Rotter (1966) has addressed the issue of conformity to hospitalization as it relates to the personality dimension of internal-

external control.

Rotter, in response to various field theorists (Witkin, et al. 1954; Linton, 1955; Riesman, 1954), suggest that there appears to be no relationship between internal-external control measures, field determination, and social or conformity forces. Rotter characterizes these field theorists as "concerned with whether the individual is controlled from within or from without." However, the internal-external orientation focuses on "the question of whether or not an individual believes that his own behavior, skills, or internal disposition determine..." the outcome.

Seeman and Evans (1966) offer evidence specific to hospitalization which further supports the contention that patients can influence their environment by influencing the staff decisions related to their therapies. Comparison of patients grouped by locus of control and matched by socio-economic class and hospital experience showed: (1) internals were better informed about their illness; (2) internals were more interactive with the staff; and (3) internals had uneventful recoveries. Gochmann (1971) offers an explanation that relates the internal-external dimension to hospitalization. Where there appears to be no causalty or when organized ways of dealing with the environmental stress are unclear or absent, the individual will organize and interact on the basis of his control dimension.

Studies of non-medical samples further support the contention that "internals" not only perceive themselves as in control but actually are able to control their environment. Phare (1965) demonstrated that "internal" students were more successful than "external" students in

altering others' opinions of them and their abilities. Pervin (1963) reported subjects with strong belief in their abilities to control their environment were significantly more successful exercising control over distressing stimuli. Rotter (1966) in summarizing empirical data about the attributes of the "internal" suggests he is able to:

> (a) be more alert to those aspects of the environment which provide useful information for his future behavior; (b) take steps to improve his environmental condition; (c) place greater value on skill or achievement reinforcements and be generally more concerned with his ability, particularly his failures; and (d) be resistive to subtle attempts to influence him (p. 25).

In light of these findings essential questions about the relationship of internal-external control to the situational variables of hospitalization and surgical recovery must be addressed.

Numerous studies have been conducted with respect to the inter-relationships between hospitalization, social interaction, and patient care. These studies include: (1) hospital size, type and organization (Kaufman, 1956; Revans, 1962b; Hughs-Jones, 1964; Resengren, 1969); (2) hospital staff interaction (Wessen, 1958); (3) quality of care (Mittlemann, 1945; Schimmel, 1964); (4) psychological and emotional aspects (Mathew, 1962; Spiegel and Demone, 1968); and (5) psycho-social interactions of patients and staff (Barnes, 1961; Revans, 1962a; Cartwright, 1963; Skipper and Leonard, 1965; Arnold, 1968; Waitzkin and Stoeckle, 1972). Yet, with this extensive information base related to hospitalization, social interaction, and patient care, little is known about the mediational effects of personality variables such as locus of control. Even less is known about the recovery process.

Lucente and Fleck (1972) have developed an instrument to assess anxiety during hospitalization which relates to many of the situational

aspects identified in the previously cited references and addressed earlier by Girdwood and Ballinger (1949). These factors relate to areas of concern about family, job, finances; illness factors such as surgery, pain and deformity; communication and organizational factors such as communication, roles, and relationships; and personal concern about guilt, death and recovery. In addition, it correlates significantly with the Taylor Manifest Anxiety Scale (1953).

Synthesis and Summary

In summary of this review of the literature, the following facts are apparent: (1) anxiety is a cuing factor important in surgical recovery; (2) coping styles which are vigilant, active in nature, are related to better post-operative recovery; (3) the personality dimension of control of reinforcement appears to be associated with coping style and related to surgical recovery; and (4) little is known about the internal-external dimension as it relates to and mediates the situational parameters of hospitalization which impinge upon recovery through the social interactional processes of care. Thus, through this study, employing Arnold's (1968) Cooperative Effort Scale and Lucente and Fleck's (1972) Hospitalization Anxiety Scale, an attempt to clarify these relationships to the control dimension and ultimately recovery will be made.

CHAPTER III

METHODS

Rationale and Assumptions

The rationale for the present study is to examine recovery as it is affected by patients' perceptions of control in the situation of surgery and hospitalization. The basic assumption underlying this research is the personality dimension of internal-external control of reinforcement is antecedent to other variables relating to and affecting recovery from orthopedic surgery.

Purpose of the Study

The purpose of this investigation is to: (1) determine if there is a relationship between the personality dimension of internal-external control (Rotter, 1966) and the recovery of the orthopedic surgery patient; (2) describe the degree of the relationship; (3) describe the parameters of the relationship toward the development of a profile that will integrate the psychological and situational variables; (4) describe the degree of the relationship to each parameter; and (5) suggest ways in which the results of this study can improve total patient care.

Design of the Study

The present study is a descriptive study of hospitalized, orthopedic surgery patients. It was carried out at an 800 bed, private

hospital in Oklahoma City, Oklahoma from June 1 to June 28, 1973. The subjects represent a select sample of patients from a solo-clinic based private orthopedic surgical practice. All surgeries were performed by the same surgeon.

Operational Definition of Variables

For the purposes of this investigation, the Independent Variable is the personality-dimension of internal-external control as measured by Rotter (1966). The internal-external locus of control scale (IE) is a 23 item forced choice instrument designed for subject's completion by circling the statement most appropriate to his belief. Score determination for this research is accomplished by counting the number of external responses circled by the subject. Thus, a high scale score denotes the "External" position and a low scale score denotes the "Internal" position.

The dependent variable for this study is recovery. For the purposes of this investigation recovery is classified as situational anxiety, the number of complications, the length of hospitalization, and the degree to which cooperative effort was maintained with the hospital nursing staff. The Hospital Anxiety Scale (HAS) (Lucente and Fleck, 1972) was chosen as the measurement instrument for indicating levels of state anxiety. The number of complications were assessed using a complicative symptoms list (CSL) developed for use in the study. Length of hospitalization (LH) was obtained from hospital records. The Cooperative Effort Scale (CES) (Arnold, 1968) was modified for quantification and used to assess patient's therapeutic interaction with the nursing staff.

Variables thought to intervene or confound recovery were controlled in this research. The control mechanism for most of these variables were implicit due to the sample source. However, care was exercised in the development of criteria for subject selection and inclusion in the study in order to further control variation and error. The rationale for controlling variables was determined on the basis of information from the literature and, in some cases, simple logic. Variables that were not controlled were either beyond control due to the nature of the sample source or left uncontrolled to perserve the integrity of the sample so that results might be more applicable for generalization to patient populations. Variables which were controlled for this study are as follows:

(1) Age - Subjects were selected for inclusion in the study between the ages of 15 and 65. The predictive instrument for the independent variable (IE) and the instruments employed to measure the dependent variables (HAS, CES) have no normative or standardization for subjects less than 15 years of age. The upper limit of 65 years was chosen to limit complication of recovery which might be related to geriatric debility.

(2) Race - The predictive instrument for the independent variable (IE) has shown definite trends suggestive of cultural confounding within non-white subjects (Rotter, 1966). Further, the nature of the sample source served to limit this variable from inclusion.

(3) Socio-Economic Status - The nature of the sample source has limited the range of socio-economic status available for inclusion in the study to middle and upper middle-class subjects. In addition, the

IE scale (Rotter, 1966) has shown higher correlation of the "external" position with lower socio-economic status.

(4) Quality of Care - Due to the use of a single hospital by the surgeon, whose patients served as the sample source, each patient received care from the same staff (Revans, 1962a). All patients received surgery from the same physician. The objective was to control for between-subject variability associated with the quality of both surgery and care. It is recognized that the accomplishment of this type control is difficult and may not have been attained. However, it is reasonable to assume that the error involved will be directional and constant, therefore, statistically assailable (Croxton and Cowden, 1939).

(5) Site/Severity of Surgery - Only those patients who were subjectively judged by the investigator to have comparable surgeries were included in the study. Sites of surgery of arm, leg, knee and ankle were chosen due to the frequency of these type injuries in orthopedic practice. Borken hips, traumatic or emergency surgeries were excluded due to the greater potential for complications in recovery. Age was also felt to be correlated to these kinds of injuries. By limiting surgical sites and evaluating severity, it was hoped that error related to between-subject variability primarily due to site would be limited. Within subject variability was the concern which led to attempting to pre-judge the severity factor. Thus, this methodology is more to limit than control the error.

(6) Psychiatric/Personality Disturbances - In light of the objective of this study to relate a personality factor (IE) to recovery, error that might confound or mediate behaviors related to therapeutic

interaction and coping style were limited.

Variables that were beyond control, but which might cause error were included in order to compare and assess their effects. These variables were frequency of prior hospitalization, length of time patient knew surgeon prior to surgery, marital status, friendship with other providers of care, educational level, and sex.

HYPOTHESES

The hypotheses for the present study are as follows:

Hypothesis I: There will be an association between Locus of Control (IE) and Hospitalization Anxiety (HAS).

Hypothesis II: There will be an association between Locus of Control (IE) and the Number of Medical/Physical Complications (CSL).

Hypothesis III: There will be an association between Locus of Control (IE) and the Length of Hospitalization (LH).

Hypothesis IV: There will be an association between Locus of Control (IE) and Cooperative Effort (CES).

Subjects

Thirty-four white subjects were used. Twenty-one were males and 13 were females. The group had a mean age of 28.6 years and averaged 13 years of education. Patients were provided by a private solo-clinic based orthopedic surgery practice. All subjects were hospitalized in an 800 bed private hospital. The group had a mean of 2.3 prior hospitalizations.

Patients were selected for inclusion in the study by the office nurse on the basis of the following criteria:

1) Age: 15-65
2) Race: White
3) Private paying or third-party insurance
4) Not admitted in traumatic or emergency circumstances
5) No history of psychiatric disturbances
6) No broken hip/or hip placement surgeries
7) Able to articulate feelings
8) Able to read and write
9) Not in acute distress at interview/questionnaire times
10) Hospitalized no less than two days

Interview Questionnaires

Four questionnaires were used in this study and each were designed to elicit different information during different intervals within the recovery process and hospitalization. Copies of each instrument are provided in the appendices. A list of instruments used in the study is as follows:

1) Pre-Surgery Patient Information Questionnaire (Appendix A)
2) Post-Surgery Patient Information Questionnaire (Appendix B)
3) Cooperative Effort Scale (Appendix C)
4) Complicative Symptoms Scale (Appendix D)

A brief discussion of each instrument follows as to its rationale, development and information that it elicits.

Pre-Surgery Patient Information Questionnaire

The purpose of this instrument is to obtain demographic information for patient identification as to age, sex, race, years of education, occupation, marital status, and religious preference. Additionally, information was recorded related to the number of prior hospitalizations, referring physician's name, length of time the patients had been under the care of the referring physician, length of time the patient had been under the care of the surgeon, whether significant family members were hospitalized in the last six months, and whether the patient had friends in the hospital who might provide some portion of care. The final portions of the questionnaire contained the Rotter (1966) internal-external locus of control scale (IE).

Post-Surgery Patient Information Questionnaire

The patient's score on the Hospital Anxiety Scale (HAS) (Lucente and Fleck, 1972) was obtained in this instrument. Hospitalization anxiety is operationalized as the anxiety which occurs during hospitalization, not necessarily about hospitalization. It is a manifest state anxiety instrument designed to measure categories that commonly worry patients. A high scale score represents a high degree of situational anxiety, while a low scale represents a low degree of situational anxiety.

The Complicative Symptoms List

This list was developed for use in this study to obtain a frequency count of specific medical complications. Development of the list was accomplished through consensual validation of four practicing

physicians as to possible complications that occur as a result of surgery. Each independently listed complications, major and minor, that effect recovery. The four were then brought together, supplied with copies of each others lists and, through a Delphi method (Levin and Kirkpatrick, 1965) arrived at the Complicative Symptoms List (CSL).

Data were collected by the Medical Record Librarian at the hospital for each patient. Instructions were to count each complication if it appeared in the medical record. Care was exercised to insure that no other information was known to the Medical Record Librarian about the other variables or hypotheses of the investigation. The audit procedure was related as a part of a study to improve patient care.

Cooperative Effort Scale

Arnold (1968) developed an instrument designed to elicit information about the therapeutic interaction of the patient and the nursing staff. It has been modified to allow for quantification of its seven items, to record the nurses' perceptions of the patient's recovery progression, and to permit additional notes or essay response germane to the patient's recovery. Its focus is to measure patient interactions that lead to recovery rather than compliance with rules of the nursing staff. Care was taken to insure blinding of nurses to the variables and hypotheses of the study. Respondents on this questionnaire were the charge nurses who coordinate all three nursing shifts on the orthopedic floor.

Interview Questionnaire Procedures

All subjects were asked to participate in the study on the day

of hospital admission. They were shown a letter of introduction from their physician which presented the study as part of a program to improve patient care. Each was insured of confidentiality. Upon agreement, they were asked to complete the Pre-Surgery Patient Questionnaire and instructed that they would be visited again on their second post-operative day. On the second post-operative day, they were revisited and completed the Post-Surgery Patient Questionnaire. Upon completion of this task, they were thanked for their cooperation. The day prior to discharge the charge nurse completed the Cooperative Effort Scale. The day following discharge, the Medical Record Librarian completed the Complicative Symptoms List and noted the number of days of hospitalization.

Upon completion of the investigation all staff, patients, and participants were thanked by personal letter.

Data Analysis

Analysis of the data was done employing appropriate correctional techniques. A descriptive analysis employing a multiple correlation analysis was performed to determine the inter-correlation matrix for those variables thought to intervene in the association of the independent variable to each dependent variable. The .05 level of probability was selected for use in determining statistical significance for this study. Probabilities greater than .05 and less than or equal to .20 are considered statistically suggestive.

CHAPTER IV

RESULTS

The degree of association between the independent variable (locus of control) and each dependent variable (hospital anxiety, cooperative effort, medical complications, and length of hospitalization) was determined using a correlation analysis adjusted for small sample size (Croxton and Cowden, 1939; Li, 1964). In addition to testing the hypotheses of this study, the degree of association of locus of control to each of several demographic variables (prior hospitalizations, family hospitalizations, education, age, sex, marital status and time the patient knew the surgeon prior to surgery) was obtained. The resultant model, based on inclusion of the most appropriate indices of recovery, identified through the multiple correlation analysis, served to complete the alternative objective of the study which was to describe a profile of patient recovery.

Table 1 presents a summary of the results of the test of the hypotheses of this study. The results of these tests of hypotheses are as follows:

Hypothesis I: <u>There will be an association between Locus of Control (IE) and Hospital Anxiety (HAS)</u>. The correlation of locus of control to hospital

TABLE 1

TESTS OF HYPOTHESES - SIMPLE CORRELATIONS
ADJUSTED FOR SMALL SAMPLE SIZE

Variables Correlated to Locus of Control	Correlation Coefficient r	Sample Size	P Value[a]	Interpretation
Hospitalization Anxiety (HAS)	.526	34	≤ 0.01	Significant
Medical Complications (CSL)	.345	34	≤ 0.05	Significant
Cooperative Effort (CES)	-.250	34	≤ 0.20	Suggestive
Length of Hospitalization (LH)	-.046	34	> 0.20	NS

[a]Determined on computed t-value by the following formula (Kendall, 1948):

$$t = r \sqrt{\frac{N-2}{1-r^2}} \qquad df\ N-2$$

anxiety was significant at the 0.01 probability level as shown in Table 1. This finding supports Hypothesis I. The correlation was positive reflecting the relationship of the internal scale position with low hospital anxiety and the external position with high hospital anxiety.

Hypothesis II: There will be an association between Locus of Control (IE) and the Number of Medical/Physical Complications (CSL). Support was also found for for this hypothesis. The correlation was significant at the 0.05 level of probability. The relationship of locus of control to medical complication indicates lower frequency of complications at the internal end of the scale and higher numbers of complications associated with the external position. Table 1 presents this result.

Hypothesis III: There will be an association between Locus of Control (IE) and the Length of Hospitalization (LH). Rejection of this hypothesis follows the failure of the correlation to attain statistical significance (Table 1). The relationship was negative between locus of control and length of hospitalization. The longer hospitalizations tended to be associated with the lower locus of control scores.

Hypothesis IV: There will be an association between Locus of Control (IE) and Cooperative Effort (CES). A trend was evident in the correlation of locus of control to cooperative effort. However, the hypothesis was rejected due to non-significance at the specified level of probability selected for use in the study. The correlation was negative which reflects the nature of the divergent

scoring methods for the Cooperative Effort Scale (Arnold, 1968) and the Locus of Control Scale (Rotter, 1966). The locus of control variable (IE) is scored from low (internal) to high (external); whereas cooperative effort is scored from high (cooperative) to low (uncooperative). Thus, the correlation reflects a tendency for the internal position to be associated with more cooperative effort. Table 1 presents each correlation, the number of correlated pairs that formed the "N" and the computed "t" value with its associated pairs level of probability.

Table 2 shows the inter-correlation matrix for all of the variables included in this study except those which were controlled or thought not pertinent to the results. Two variables have not been included for analysis even though they were assessed. Information about patient's friendships with members of the hospital staff was assessed in order to control for the possible between-subject confounding of quality of care. However, none of the patients in this study reported having friends on the hospital staff. Thus, this variable was deleted. The other variable, the amount of time the patient had been under the care of a referring physician, proved to be difficult to obtain and irrelevant to the situation. Many patients had no personal physician, several had been referred for surgery, and none of the patients received any care from anyone other than the surgeon or his staff. Based on these facts this control measure of the patient-physician relationship

TABLE 2

Multiple Correlation Matrix of Variables Included for Analysis

Prior Hospitalization	Family Member Hospitalization	Education	Age	Sex	Marital Status (MS)	Time They Knew Surgeon (TKS)	Internal External (IE)	Hospitalization Anxiety (HAS)	Cooperative Effort	Length Hospitalization (LH)	Medical Complication (CSL)	
1	.127	.245	.186	-.214	-.061	.439	-.057	.145	-.196	.048	.306	Prior Hospitalization
	1	-.087	.016	-.214	.077	-.073	.085	.126	.052	-.049	.098	Family Member Hospitalization
		1	.304	-.026	.370	-.112	-.189	.223	-.442	.198	.179	Education
			1	-.384	.822	-.101	-.305	-.092	-.066	-.047	-.022	Age
				1	-.253	-.154	-.265	-.153	.045	.043	-.255	Sex
					1	-.221	-.224	.057	-.124	.038	-.039	Marital Status (MS)
						1	.059	.069	.159	-.173	-.073	Time They Knew Surgeon (TKS)
							1	.526	-.250	-.046	.345	Internal-External (IE)
								1	-.587	.229	.540	Hospitalization Anxiety (HAS)
									1	-.481	-.682	Cooperative Effort
										1	.532	Length Hospitalization (LH)
											1	Medical Complication (CSL)

was also deleted from the analysis.

Examination of Table 3 shows the four highest correlates among the demographic variables with locus of control. These are age, sex, marital status, and education respectively. All are negative and non-significant. As shown in Table 3 the correlation of age to locus of control indicates an inverse relationship such that lower (internal) locus of control scores are associated with older patients. Higher scores (external) appear grouped among younger patients. The level of significance of this correlation indicates a statistical trend in the direction of the association of age in the recovery profile.

Similarly, there is also a trend in the association of sex and locus of control. In order to aid in the interpretation of this correlation, patient means on the locus of control variable were compared by sex. Table 4 shows: the results of this comparison; the results of a "t" test which was run to determine the associated probability of the observed mean difference; and the probability value. As is evident in Table 4, supported by the correlation of sex and locus of control in Table 3, there appears to be a trend toward lower (internal) scores among males and higher (external) scores among females.

Marital status did not reflect a statistical trend. Therefore, due to the dichotomous, discrete nature implicit in the underlying distribution of marital status, and since marital status is highly correlated with age (Table 2), age was retained in the analysis. Table 5 presents a comparison of two multiple correlation analyses of the demographic correlates to locus of control, including marital status in one analysis and deleting it in the other. It is clear that by deleting

TABLE 3

SELECTED HIGHEST DEMOGRAPHIC CORRELATES TO LOCUS OF CONTROL

Variables Correlated to Locus of Control	Correlation Coefficient r	Sample Size	P Value[a]	Interpretation
Age	-.325	34	$\leq$0.10	Suggestive
Sex	-.265	34	$\leq$0.20	Suggestive
Marital Status	-.224	34	0.20	NS
Education	-.189	34	0.20	NS

[a]Determined on computed t-value by the following formula (Kendall, 1948):

$$t = r\sqrt{\frac{N-2}{1-r^2}}$$

$$df\ N-2$$

TABLE 4

MEAN SCORES ON LOCUS OF CONTROL (IE) BY SEX

	Mean Score (IE)	Number of Subjects	"t" Value	P Value	Interpretation
Male	7.9	21	1.56	$\leq$0.20	Suggestive
Female	10.2	13			

TABLE 5

COMPARISON OF MULTIPLE CORRELATIONS OF AGE, SEX, AND EDUCATION WITH AND WITHOUT MARITAL STATUS TO LOCUS OF CONTROL

Variables Correlated with Locus of Control	Multiple Correlation Coefficient r	Sample Size	P Value	Interpretation
Age, Sex, Education, Marital Status	.459	34	≤ 0.01	Significance
Age, Sex, Education	.464	34	≤ 0.01	Significance

marital status the correlation is improved. Thus, it would appear acceptable to retain age in determining a descriptive profile of recovery because of: its underlying continuous distribution; its more representative nature as a general descriptive variable; and because the high correlation of age to marital status explains essentially the same variability.

Although education is not significantly related to locus of control, its negative correlation with locus of control indicates an inverse relationship in which higher education is associated with lower (internal) locus of control scores. In order to determine the contribution of education to the multiple correlation of age and sex with locus of control, a comparison analysis was performed including education. Another was run excluding education. Table 6 presents the

TABLE 6

COMPARISON OF MULTIPLE CORRELATIONS OF AGE AND SEX WITH AND WITHOUT EDUCATION TO LOCUS OF CONTROL

Variables Correlated with Locus of Control	Multiple Correlation Coefficient	Sample Size	P Value	Interpretation
Age, Sex, Education	.464	34	≤ 0.01	Significance
Age, Sex	.487	34	≤ 0.01	Significance

results. As is evident from the table, by eliminating education the multiple correlation of age and sex to locus of control is slightly improved.

Comparison of the relative contributions of age and sex to the multiple correlation with locus of control was done using a partial correlation (Croxton and Cowdon, 1939). Table 7 compares the partial correlation of age to locus of control holding sex constant and the partial correlation of sex to locus of control holding age constant. In addition, the partial correlations are compared to the simple correlations for each variable to locus of control. As shown in Table 7 each variable explained less variance when the other was held constant, suggesting the importance of both. Age and sex appear to be potential intervening variables and important demographic information for

TABLE 7

PARTIAL CORRELATION OF AGE TO LOCUS OF CONTROL HOLDING SEX CONSTANT AND SEX TO LOCUS OF CONTROL HOLDING AGE CONSTANT

Variables Correlated to Locus of Control	Correlation Coefficient	Sample Size
Age - alone	-.325	34
Age - Sex Constant	-.249	34
Sex - alone	-.265	34
Sex - Age Constant	-.161	34

description of locus of control as it relates to the dependent variables.

A multiple correlation analysis of hospitalization anxiety (HAS), medical complications (CSL) and cooperative effort (CES) was performed combining each separately with age and sex for correlation with locus of control (IE) for the purpose of determining which is the most appropriate measure of recovery. Length of hospitalization was not used in this analysis due to its statistical non-significance. Table 8 presents each of the multiple correlations.

The highest correlate with locus of control is hospitalization anxiety. As noted in Table 8, both medical complications (CSL) and cooperative effort (CES) appear to be about equal correlates. It

TABLE 8

MULTIPLE CORRELATION ANALYSIS OF HOSPITALIZATION ANXIETY, MEDICAL COMPLICATIONS, AND COOPERATIVE EFFORT WITH AGE AND SEX TO LOCUS OF CONTROL

Variables Correlated to Locus of Control	Multiple Correlation Coefficient	Sample Size	P Value	Interpretation
Age, Sex, Hospitalization Anxiety	.645	34	≤ 0.01	Significance
Age, Sex, Medical Complications	.518	34	≤ 0.05	Significance
Age, Sex, Cooperative Effort	.537	34	≤ 0.05	Significance

would appear, from this information and the simple correlation of hospitalization anxiety to locus of control from Table 1, that it is the best indicant of recovery. However, due to the fact that the highest demographic correlate to hospitalization anxiety is education another multiple correlation was performed including education with age and sex. Table 9 presents these correlations. As is shown the correlation of hospitalization anxiety was improved slightly by including education.

In order to determine whether a combination of hospitalization anxiety with each of the other dependent variables might form a better measure of recovery, each was combined with age, sex, education, and hospitalization anxiety and correlated to locus of control. Table 10

TABLE 9

MULTIPLE CORRELATION ANALYSIS OF HOSPITALIZATION ANXIETY, MEDICAL COMPLICATIONS AND COOPERATIVE EFFORT WITH AGE, SEX, AND EDUCATION TO LOCUS OF CONTROL

Variables Correlated to Locus of Control	Multiple Correlation Coefficient	Sample Size	P Value	Interpretation
Age, Sex, Education, Hospitalization Anxiety	.664	34	≤ 0.01	Significant
Age, Sex, Education, Medical Complications	.507	34	≤ 0.05	Significant
Age, Sex, Education, Cooperative Effort	.560	34	≤ 0.05	Significant

presents these multiple correlations. It is clearly evident that hospitalization anxiety forms the best indicator of recovery whether taken alone or in combination.

Further support for this finding is shown in Table 11 which gives the partial correlations of each of the other dependent variables to locus of control holding hospitalization anxiety constant for each. Hospitalization anxiety explains most of the variance also explained by cooperative effort and medical complications. The strength of the correlation of Locus of Control to length of hospitalization appears to improve. However, due to possible confounding of this variable interpretation must be conservative. In addition, examination of Table 2

TABLE 10

AGE, SEX, EDUCATION, AND HOSPITALIZATION ANXIETY COMBINED WITH EACH DEPENDENT VARIABLE AND CORRELATED TO LOCUS OF CONTROL

Variables Correlated to Locus of Control	Multiple Correlation Coefficient	Sample Size	P Value	Interpretation
Age, Sex, Education, Hospitalization Anxiety and Medical Complications	.649	34	≤ 0.01	Significant
Age, Sex, Education, Hospitalization Anxiety and Cooperative Effort	.649	34	≤ 0.01	Significant
Age, Sex, Education, Hospitalization Anxiety, and Length of Hospitalization	.653	34	≤ 0.01	Significant

TABLE 11

PARTIAL CORRELATIONS OF LOCUS OF CONTROL TO EACH DEPENDENT VARIABLE HOLDING HOSPITALIZATION ANXIETY CONSTANT

Variable Correlated to Locus of Control	Partial Correlation Coefficient	Simple Correlation Coefficient
Medical Complications	.085	.345
Cooperative Effort	-.085	-.250
Length of Hospitalization	-.201	-.046

shows high intercorrelation among the dependent variables. As might be expected, these intercorrelations follow logically from the hypotheses tested in this study. A summary of the correlations follows:

1) Hospitalization anxiety to cooperative effort suggests an association of high anxiety with poor cooperative effort;
2) Hospitalization anxiety to length of hospitalization suggests an association of high anxiety with longer hospitalization;
3) Hospitalization anxiety to medical complications suggests an association of high anxiety with more complications;
4) Cooperative effort to length of hospitalization suggests an association of longer hospitalization with less cooperative effort;

5) Cooperative effort to medical complications suggests an association of less cooperative effort with more medical complications;

6) Length of hospitalization to medical complications suggests an association of longer hospitalization with more medical complications.

Finally, a multiple correlation analysis (Croxton and Cowden, 1939) was performed in order to demonstrate the association of a recovery profile (age, sex, education, and locus of control) to hospitalization anxiety. The resultant multiple correlation was $r = .617$.

CHAPTER V

DISCUSSION

Studies of the recovery process are of great importance to many aspects of patient care, in that they provide a descriptive base from which subsequent research of several kinds can grow and patient care can be improved.

The primary purpose of this research was to determine if there is a relationship between the personality dimension of internal-external locus of control (Rotter, 1966) and the recovery of orthopedic surgery patients. However, accomplishment of this objective depends in part upon operationalizing and describing recovery. This is no easy task since there appears to be no consistent agreement among researchers as to the parameters of the process or the methodology for their use in its investigation. Therefore, it is incumbent upon this study to attempt to describe recovery in a sufficiently extensive manner, considering as many components of the process as possible within the constraints of the psychological orientation from which this study stems.

Two approaches were followed in achieving the objectives of this study. First, the correlation of locus of control with each dependent variable was tested for statistical significance. The second was entirely descriptive, with the intent of constructing a recovery profile, sensitive to intervening demographic variables that mediate

the relationship of locus of control to the most appropriate and best indicant of recovery.

This study demonstrates that the personality dimension of internal-esternal locus of control (Rotter, 1966) is significantly related to two of the four measures of recovery employed in this study, i.e., hospitalization anxiety and post-operative medical complications (Table 1). This is especially important in light of the Hospitalization Anxiety Scale (Lucente and Fleck, 1972) which purports to measure fear, resentment, and hostility in addition to correlating highly with the Taylor Manifest Anxiety Scale (Taylor, 1953). Considering Lucente and Fleck's (1972) speculations about the sources of anxiety during hospitalization (i.e., patient's antecedent environment, the hospital environment, the precipitating illness, and the patient's personality structure) it would appear that the dimension of locus of control might be associated with particular sets of personality traits which indicate coping style.

The implication of this finding suggests the possibility that the dimension of locus of control (Rotter, 1966) may have potential as a predictive, screening instrument for use in identifying patients who might have problematic or troublesome post-surgical recovery. When post-operative medical complications are considered in relationship to locus of control and hospitalization anxiety, there appears an even stronger justification for suspecting a causal association between hospitalization and post-operative medical complications. Table 11 supports this contention, reflecting a large decrease in the correlation of locus of control to post-operative medical

complications when hospitalization anxiety is held constant. However, this study does not intend to substantiate the link, but rather to suggest that further research efforts appear warranted.

A third recovery measure, i.e., cooperative effort, showed a statistical trend with relationship to locus of control (Table 1). Cooperation, as expressed by Arnold (1968) may best be described as:

> an ability on the part of the patient to maintain interaction between himself and the nursing staff...as an active participant in the creation of adequate hospital care...towards both care and rehabilitation (p. 7).

Examination of Table 2 shows intercorrelations among the measures of recovery. Cooperative effort is highly correlated with each of the other three measures. There is a particularly high correlation between hospitalization anxiety and cooperative effort. Table 11 shows a substantial decrease in the correlation of locus of control to cooperative effort holding hospitalization anxiety constant. This again appears to raise hypotheses related to the causal sequence between hospitalization anxiety and cooperative effort, another area deserving more research.

The length of hospitalization which was intended to be the fourth measure of recovery proved to be problematic. Table 11 shows an increase in the correlation of locus of control to length of hospitalization as hospitalization anxiety is held constant. Although it appears to increase slightly the multiple correlation to locus of control and the demographic variables when paired with hospitalization anxiety (Table 10) and intercorrelates with the other three measures of recovery, any interpretation must be conservative and limited. Near the conclusion of the study evidence was found which strongly suggests that due to

the surgeon's admission and discharge procedures, and the hospital's policy this measure is severely confounded. That is, there appears no way to separate the relative effect of the discharge policy or the patient's influence upon the length of hosptialization variable. This is not an unexpected occurrence since it has been addressed in some of the literature regarding the methodology of experimentation on the quality of care within the hospital structure (Leissitz, 1962; Donabedian, 1972).

The relatively high intercorrelations of the recovery measures (Table 2) suggests that each is measuring similar variability. It also would seem logical to assume the variability to be that of the phenomenon of recovery. Perhaps more important is the identification of the demographic variables (Tables 2-7) which mediate locus of control; the isolation of hospitalization anxiety as the best indicant of recovery of the four used in this study (Tables 1, 8, 9 and 10); and the construction of a recovery profile. Observation of the patients in this study suggests the following sketch of the two types of ideal-typical patients, integrating their recovery profiles in order to present a summary of the characteristics associated with both uneventful and troublesome recoveries.

The patient who experienced an uneventful recovery usually tended to score in the internal range of the internal-external locus of control scale (Rotter, 1966). Characteristically, this type of patient was an older male with higher education and married. He experienced and expressed low anxiety during the hospitalization, had fewer post-operative medical complications, and maintained a cooperative

interaction with the nursing staff toward ultimate rehabilitation. Although physically impaired, therapeutic activity was maintained throughout the process of recovery. Generally only one prior hospitalization was reported.

The patient who experienced troublesome recovery as a rule scored in the external range of the internal-external locus of control scale (Rotter, 1966). Apathy, criticism, and complaining were usually pronounced in the patient's behavior. The hospital anxiety score was elevated and subjective ratings by the nursing staff appeared to substantiate the presence of manifest anxiety. The patient generally was younger, single, less education, and female. Cooperation with the nursing staff was poor as emphasized by the continual failure of the patient to comply with instructions to perform instrumental response such as deep breathing, sitting-up, walking, and exercising the limb. As might be expected more post-operative complications occurred in this type of patient. There was more regret expressed about the decision to have the surgery.

Group similarities were present. As general information, the group was all white, middle class, and exhibited no differences by religion. Of special importance to the recovery profile, these characterizations and the results of this study, is the fact that none of these patients experienced life threatening or traumatic complications. In other words, the study patients are thought to be representative of those patients who seek the services of orthopedists in private practice. It would seem, therefore, that this has implications for future endeavors related to research to improve patient care. Admittedly,

there are a number of questions and considerations worthy of discussion.

Possibly, the most serious and important research question focuses on the necessity to establish the causal sequences within the process of recovery. Descriptive, retrospective studies are important in generating hypothesis for research in a new area such as recovery, however, prospective predictive studies need to be developed in order to determine whether patient's locus of control scores might serve as an effective screening device; to determine if hospitalization anxiety causes patients to be less cooperative and to experience more complications or whether patients are more anxious and less cooperative because they have more complications. Obviously these are but a few of the questions to be resolved. Additional work is needed to determine the motivational aspects that encourage patients to give up the sick role; to determine the effects of anxiety and stress as they modify physical functions and response; to determine the effects of personality especially with regard to stress behavior; and to assess cultural and organizational influences in surgical recovery. Ultimately, the research of these diverse areas will also need to be integrated into a consistent theoretical framework. This framework must be flexible in order to interrelate the totality of the factors and sensitive to the concept of holism which unites sub-systems into an ecological model. This broader, more general, approach must ultimately become the mechanism for evaluating subsequent research. Finally, without the effective translation of these results to the surgeon, the nurse, and the hospital all efforts will be merely exercises in academia. Perhaps Oliver Wendell Holmes says it best,

> The recording of facts is one of the tasks of science, one of the steps toward truth; but it is not the whole of science. There are one-story intellects, two-story intellects, and three-story intellects with sky lights. All fact collectors who have no aims beyond their facts, are one-story men. Two-story men compare, reason and generalize, using the labors of the fact collectors as well as their own. Three-story men idealize, imagine, and predict. Their best illumination comes from above, through the sky light (Holmes, 1966, p. 129).

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APPENDIX A

PRE-SURGERY
PATIENT INFORMATION QUESTIONNAIRE

The following questionnaire has been designed to give information about your hospitalization in order that it may be more pleasant for you and future patients. Please, answer all of the following questions.

Name _____ Date ____/____/____
Mo. Day Year

Hospital _____ Ward or Room _____

Prior Hospitalizations _____
(Number)

Physician's Name _____

How long have you been under the care of your physician?

_____ (time period)

Surgeon's Name _____

How long have you been under the care of your surgeon?

_____ (time period)

Do you know anyone else who is providing for your care during hospitalization? _____(list name and title)

Has any member of your immediate family been hospitalized in the last six months? _____ Yes _____ No

Occupation _____

Age _____

Sex: Male _____ Female _____

Ethnic Group _____

Present Marital Status:

_____ Married

_____ Divorced

_____ Separated

_____ Widowed (r)

_____ Never Married

Education Attained:

_____ Grade School

_____ High School

_____ Technical School

_____ College

_____ Advanced Graduate Degree

Religious Preference:

_____ Protestant

_____ Catholic

_____ Jewish

_____ Other

_____ None

Below are a number of statements about various topics. They have been collected from different groups of people and represent a variety of opinions. There are no right or wrong answers to this questionnaire; for every statement there are large numbers of people who agree and disagree. Please indicate whether you agree or disagree by circling the statement to which you agree. Please read each item carefully and be sure you indicate which response (A or B) most closely corresponds to the way which you personally feel or have felt, by circling "A" or "B" for each number. Please respond to <u>every</u> item.

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 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 on 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 that 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 on 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 is really 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 a student studies and the grade he gets.

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 play an important role in my life.

26. A. People are lonely because they don't try to be friendly.

    B. There is 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 government on a national level as well as on a local level.

APPENDIX B

POST-SURGERY
PATIENT INFORMATION QUESTIONNAIRE

Patient Name _____

Date _____/_____/_____
Mo. Day Year

Hospital _____

Ward or Room _____

The following statements describe feelings experienced by many patients while they are in the hospital. Read each question, circle the letter which expresses whether you feel that way never, sometimes, or often.

1. N S O While in the hospital I feel that I am under a great deal of strain.
2. N S O I find it difficult to sleep in the hospital.
3. N S O I feel like yelling at the nurses and aides.
4. N S O I become impatient with the nurses and aides.
5. N S O I am afraid of not waking up in the morning.
6. N S O I think that the doctors are too slow in helping me.
7. N S O It makes me nervous to have to sleep in such a high bed.
8. N S O I worry about the lack of privacy here in the hospital.
9. N S O I worry that I am being treated like "just another case".
10. N S O Hospital hours and schedules bother me.
11. N S O I worry about how I will pay for the hospital bill.
12. N S O I don't think that the doctors are doing everything they can to help me.
13. N S O When the doctor comes to give me a report I expect bad news.
14. N S O I am afraid that the pain will be more than I can stand.
15. N S O I am afraid that I won't be any better when I get out.
16. N S O I am afraid that they will let me go too early.
17. N S O Having to leave the hospital eventually bothers me.
18. N S O I think that the doctor is not telling me the truth about my illness.
19. N S O I feel nervous in the hospital.

Please indicate how often you become nervous, or worry about the following while you are in the hospital:

20. N S O Family

21. N S O Friends

22. N S O Money

23. N S O Your illness

24. N S O Your Future

25. N S O Death

26. N S O Treatment in the hospital

27. N S O Being around many other people

28. N S O Being in a new and different situation

29. N S O Pain

30. N S O Not being told enough about your illness and treatment

31. N S O Future handicap

32. N S O Future work

33. N S O Feeling lonely

The last few questions are yes-and-no questions.

34. N Y I have nightmares and bad dreams more often than I do at home.

35. N Y My feelings are hurt more easily than most patients'.

36. N Y I am sometimes afraid of tests and types of treatment even when I know they can't hurt me.

37. N Y I feel helpless with my illness.

38. N Y Feeling helpless bothers me.

39. N Y I worry about my family more than most patients.

40. N Y I am afraid that I won't be able to work as well when I go back.

APPENDIX C

COOPERATIVE EFFORT SCALE

The following questionnaire has been designed to give information about your patient. It was designed by a nursing team to aid in this research. Please answer all of the following questions about your patient.

Patient Name _____ Date ____/____/____
Mo. Day Year

Hospital _____ Ward or Room _____

Please, check the appropriate answer for each of the following questions.

1. Is the patient accepting the gravity of his situation?

   _____ Yes

   _____ No

2. Is the patient abiding by restrictions?

   _____ Yes

   _____ No

3. Is the patient taking advantage of his freedoms?

   _____ Yes

   _____ No

4. Can he communicate his physical and psychological condition to the nursing staff?

   _____ Yes

   _____ No

5. Does the patient accept the care of the nursing staff?

   _____ Accepting of their attentiveness

   _____ Rejecting of their attentiveness

6. Does the patient realize others in the hospital require the care and attention of the nursing staff?

   _____ Yes, tolerant

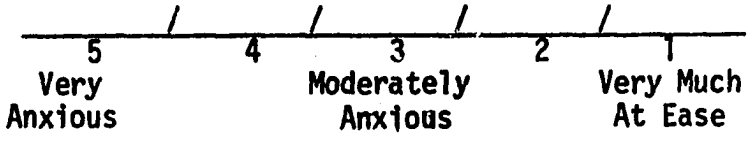
   _____ No, intolerant

7. Has the patient centered his attention on:

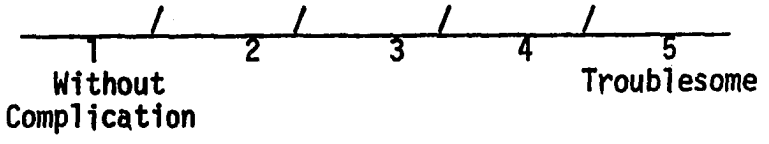
_____ Recovery

_____ The condition of his illness

8. Please rate the patient on the following scale.



9. Please rate how the patient's recovery progressed.



10. Please write any additional comments germain to the patient's recovery on the back of this page.

APPENDIX D

COMPLICATIVE SYMPTOMS SCALE

The following is a list of complications which could occur after Orthopedic surgery. It was designed by a team of physicians to aid in this research. Please check any which were associated with the patient during hospitalization.

Check any of the following which were associated with the patient during hospitalization:

_____ Prolonged elevated temperature

_____ Prolonged elevated white count

_____ Prolonged elevated systolic blood pressure

_____ Prolonged elevated pulse rate

_____ Emesis

_____ Inability to void

_____ Dysuria

_____ Constipation

_____ Diarrhea

_____ Incontinence

_____ Excessive general pain complaints

_____ Lost or disturbed sleep

_____ Psychopathology - depression, etc.

_____ Failure to follow medical or surgical orders

_____ Anorexia

_____ Stress Ulceration

_____ Fluid intake - excessive

_____ Fluid intake - inadequate

_____ Dehiscence

_____ Surgical site drainage - excessive

_____ Surgical site drainage - inadequate

_____ Surgical site erythema

_____ Surgical site fluctuance

_____ Surgical site hemorrhage

_____ Dystemia - shortness of breath

_____ Chest pain

_____ Hemoptysis

_____ Deep calf pain

_____ Embolemia - thrombophlebitis, pulmonary thrombosis, etc.

_____ Pneumonia

APPENDIX E

PATIENT DATA

I.D. #	# Prior Hosp.	Fam.Mem Hosp. Last 6 Months	Occupation	Education # Years	Age	Sex	Marital Status	Religion	Time Knew Physician	Time Knew Surgeon	Know Staff	I.E.	Hospitalization Anxiety	Cooperative Effort	Nurse Anx.	Nurse Rec.	CSL Freq.	LH # Days
1	0	Yes	Secretary	12	19	F	S	C	6 Yrs.	6 Wks.	No	11	10	7	2	1	2	5
2	0	No	Business	16	26	M	M	P	5 Yrs.	1 Day	No	10	12	6	3	2	0	5
3	3	No	Teacher	16	24	F	S	J	6 Yrs.	6 Mos.	No	18	38	2	4	5	5	7
4	0	No	Student	10	16	M	S	P	---	6 Wks.	No	12	15	4	2	3	0	5
5	4	No	Student	11	17	M	S	P	1 Yr.	6 Wks.	No	5	7	6	2	1	3	9
6	1	Yes	Teacher	17	24	M	M	P	18 Yrs.	1 Day	No	6	11	3	3	3	2	7
7	2	Yes	Hairdresser	12	27	F	M	N	8 Yrs.	2 Mos.	No	12	16	7	4	1	1	5
8	3	No	Student	9	15	F	S	P	12 Yrs.	10 Yrs.	No	14	12	6	4	2	2	5
9	0	No	Student	11	17	M	S	P	15 Yrs.	5 Yrs.	No	13	11	7	5	1	0	3
10	3	No	GYM-Coach	15	22	M	S	P	---	3 Yrs.	No	6	18	4	3	4	4	6
11	3	Yes	Farmer	14	21	M	S	P	---	4 Mos.	No	3	9	5	2	2	2	7
12	5	No	Pilot	14	60	M	M	P	---	1 Wk.	No	1	9	6	1	1	1	5
13	7	No	Student	15	24	M	S	P	14 Yrs.	9 Mos.	No	4	11	4	2	1	2	5
14	0	Yes	Student	10	15	M	S	P	---	1 Wk.	No	7	12	6	3	1	2	4
15	2	No	Student	11	17	M	S	P	2 Yrs.	1 Mo.	No	11	19	5	4	3	2	5
16	4	No	Orderly	12	20	M	S	P	20 Yrs.	3 Yrs.	No	12	5	7	4	2	0	4
17	2	No	Sales Clerk	13	59	F	W	P	1 Yr.	1 Mo.	No	8	11	3	3	3	3	8
18	8	Yes	Homemaker	14	65	F	M	C	---	7 Yrs.	No	5	10	7	3	1	0	2
19	1	Yes	Homemaker	12	55	F	M	J	4 Mos.	1 Wk.	No	9	9	5	3	2	2	6
20	8	No	Merc.Inspec.	16	25	F	S	P	22 Yrs.	13 Yrs.	No	6	11	5	2	2	2	6
21	8	Yes	Student	11	16	F	S	P	4 Yrs.	6 Mos.	No	18	20	2	5	4	6	5
22	1	No	Teacher	16	43	F	M	P	---	1 Wk.	No	15	18	3	4	4	3	4
23	0	No	Student	12	18	M	S	P	---	1 Wk.	No	6	5	7	4	1	1	4
24	1	No	Student	10	15	M	S	P	3 Yrs.	2 Yrs.	No	7	8	5	3	3	0	6
25	0	No	Rancher	12	43	M	M	P	---	1 Wk.	No	3	13	4	2	2	2	5
26	2	Yes	Construction	12	19	M	S	J	12 Yrs.	1 Mo.	No	13	18	5	4	3	1	5
27	0	No	Student	10	15	M	S	P	---	1 Wk.	No	10	10	6	3	3	1	4
28	3	No	Teacher	16	48	M	M	C	---	6 Mos.	No	12	18	3	3	2	3	6
29	1	No	Homemaker	12	51	F	M	P	---	2 Yrs.	No	3	2	7	1	1	0	2
30	2	No	Student	17	21	M	S	N	---	1 Mo.	No	6	2	5	1	3	0	4
31	0	No	Student	11	16	M	S	P	15 Yrs.	1 Mo.	No.	11	0	7	3	1	2	5
32	0	No	Laborer	14	20	F	S	C	4 Yrs.	1 Mo.	No	6	10	5	3	2	1	5
33	2	No	Exec.	16	29	M	M	P	1 Yr.	6 Mos.	No	7	26	3	2	3	3	7
34	1	No	Nurse	13	50	F	M	P	1 Mo.	1 Wk.	No	7	2	6	1	1	2	7