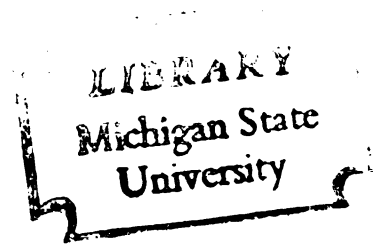


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1980

THE LIKELIHOOD OF PATIENT ADHERENCE
TO A MEDICAL REGIMEN:
COMPARISON OF
PATIENTS' AND PHYSICIANS' JUDGMENTS

By
Marilyn Good Rothert

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ABSTRACT

THE LIKELIHOOD OF PATIENT ADHERENCE TO A MEDICAL REGIMEN: COMPARISON OF PATIENTS' AND PHYSICIANS' JUDGMENTS

By

Marilyn Good Rothert

The purpose of this study was to compare how physicians and patients use information to judge the likelihood that a patient will carry out a prescribed medical regimen. Based on an adaptation of Brunswik's lens model, this research compared judgments of physicians and patients and the importance physicians and patients placed on four cues in making those judgments. Comparison of subjective and objective weights was also studied, as well as patients' perceptions of physicians' judgment policy.

The four cues studied in relation to the judgment were (1) convenience or amount of lifestyle change involved in carrying out the treatment plan, (2) cost of carrying out the regimen, (3) severity of illness, and (4) support received from significant others. Hypertension was the disease entity upon which the study was based.

Thirty physician and thirty patient subjects were recruited from an ambulatory care center. Of the 30 physicians participating in the study, 16 were allopathic physicians (M.D.) and 14 were osteopathic physicians (D.O.).

This study had four independent variables (cues) with three levels of each. Judgments were made by subjects on 27 hypothetical cases. Each case described a level of each of the cues. The dependent variable was a judgment made on a 5-point scale. This was a comparative study,

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with two groups of 30 subjects each (physicians and patients). Parallel written instruments for physicians and patients were developed and field tested prior to the study. The design of the research was a 1/3 replicate of a 3^4 fractional factorial. Major analysis was done by multiple regression and multivariate analysis of variance for repeated measures. Results showed that:

1. Approximately 60% of variation in judgments of physicians and patients regarding the likelihood that a patient will carry out a treatment plan was explained by a linear combination of the cues convenience, cost, severity, and support.
2. Patients were inclined to judge that they probably would carry out a treatment plan.
3. Physicians were inclined to judge that patients may or may not carry out a treatment plan.
4. Physicians and patients demonstrated a similar pattern in the use of cues convenience, cost, and severity. Physicians placed greater importance on the cue support.
5. Physicians and patients made judgments of the likelihood of a patient's adhering to a medical regimen using a complex combination of the cues cost, support, convenience, and severity of illness.
6. Self-reported subjective weighting was less useful than statistical weighting in explaining physicians' and patients' policy in judging the

likelihood of a patient's adhering to a medical regimen.

7. Patients perceived physicians' weighting of the cues as not congruent with patients' own policy. Specifically, patients thought physicians placed primary importance on the cue severity, and little importance on the other three cues when judging the likelihood that a patient would carry out a treatment plan.

These results indicated that both physicians and patients were using a complex combination of cues, but making different judgments regarding the likelihood that a patient would adhere to a treatment plan. These findings add to the growing list of tasks modelled by the judgment paradigm and suggest a health education approach that would support the positive intentions of patients to carry out the medical regimen.

DEDICATED TO
the memory of my parents,
Richard George Good and
Evelyn Simmons Good

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I am grateful for the wide range of support which enabled me to carry out this research. My appreciation is extended to all the members of my committee: Dr. Kent Gustafson, for his support; Dr. Walter Hapkiewicz, for his interest and encouragement; Dr. Joseph Papsidero, for generously sharing his broad knowledge of health education as well as being a very sensitive and patient "boss"; and to Dr. Sarah Sprafka, for sharing her expertise in judgment theory, validating the instrument, and providing very practical direction.

Dr. Stephen Yelon, as committee chairman, generously gave of his time to patiently guide this research from its inception. His sensitive direction, encouragement and faith that this task would one day be accomplished were major factors in the completion of my program.

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CHAPTER I
INTRODUCTION

CHAPTER I

INTRODUCTION

Studies have shown that only one-third of chronically ill patients follow prescribed medical regimens (Cohen, 1979). Perhaps this is because prevention and treatment of disease today increasingly involve a change in lifestyle rather than treatment which a physician renders directly to a patient. Physicians are not unaware of this situation. In fact, health care providers realize that their diagnosis and prescription for treatment do not necessarily mean that a patient will carry out the treatment.

Need for the Study

To demonstrate the need for a study about the nature of judgments made by patients and physicians related to patients' following medical regimens, the problem of noncompliance will be examined and physician-patient concordance discussed. In this discussion, physician-patient concordance means mutual understanding about the treatment program, that is, agreement between what a patient thinks he is supposed to do and what a physician thinks the patient is doing. Concordance between physicians and patients is likely to positively influence the occurrence of health promoting behavior as patients perceive they share with their physicians common understandings of treatment programs. Understanding physician-patient concordance requires examination of physicians' and patients' perceptions of situations and the personal and contextual factors influencing patients' decisions made to follow regimens. Better understanding of the perceptions of physicians and patients as they strive toward concordance

may increase the knowledge of how patient education can positively influence health promoting behavior. If there is a lack of congruence, understanding the nature of the conflict is a first step toward resolution of the differences.

The Problem of Noncompliance. Assuming that carrying out the physician's recommendations leads to better health, the consequences of failure to follow prescribed regimens is a concern to both providers and patients. The best medical regimen can only be as effective as the extent to which the patient carries out the physician's intentions. A patient invests time and money entering the health care system to seek help with a health need. However, the investment may provide little benefit if the recommendations are not followed. The literature suggests frustration on the part of physicians who diagnose a patient's health problem, then prescribe a regimen to promote better health and subsequently find the patient is not carrying out the prescribed regimen (Podell & Gary, 1976). A physician's judgment regarding appropriate medical regimen is based on an assumption that carrying out a specific regimen will assist a patient toward optimal health. A physician bases critical decisions in diagnosing and managing a health care problem on a patient's response to a therapeutic regimen. If there is no response to a usually effective regimen, a physician may decide to change the treatment or even question the diagnosis. Yet, one reason a regimen may appear to be ineffective is that the patient is not following it (Caron and Roth, 1968). Physicians have been shown to substantially overestimate compliance of their own patients and to be very unreliable predictors of whether their patients will comply (Sackett and Haynes, 1976). If a patient modifies or fails to carry out all or part of the regimen, the physician's decisions will be based on

inadequate information and results cannot be adequately interpreted. Thus, the patient's health care will be less effective as well as less efficient, and the goals of both the physician and patient will be compromised.

Patient education is seen as a major portion of a solution to the problem of how to increase behaviors that lead to better health. One current definition of patient education is "any combination of learning experiences designed to facilitate voluntary adaptations of behavior conducive to health," (Green, Kreuter, Deeds, and Partridge, 1980). Previously, patient education was viewed in an educational framework with physician as teacher and authority figure and patient as learner. In this framework, the physician was viewed as the source of knowledge, and the physician's role was to determine knowledge the patient needed to know and to deliver this information to the patient. The patient's role was to learn the information. Compliance was used as the criterion measure of patient education, based on the assumption that if people knew what was best for their health, they would do it. Milio (1976) points out that if this assumption were true, health professionals would be the most robust persons in the nation.

Recent attention has focused on a model of patient education recognizing that a patient's active participation is essential to successful health care. With recognition that most decisions are made by patients out of direct control of the physician, shared decision-making between physician and patient is a logical development within the health care delivery system.

Physician-Patient Concordance. The interaction between physician and patient has been shown to be a major influence affecting the impact of health education on patient health behaviors. Attention has previously been focused on attributes of the patient related to adherence to physician's orders, but few studies have examined both physician and patient, and the perceptions and interactions of each in a specific situation. Benarde and Mayerson (1978) note that physician-patient interaction is essential for compliance. Suggesting physician-patient negotiation as a means of increasing compliance, they point out that it should not be assumed that a patient and physician share common goals. They note that a physician must be able to determine what is meaningful to a patient, and in turn, let the patient know what is meaningful to the physician. Hulka, Cassel, Kupper and Burdette (1976) assert that researchers have not seriously studied the extent to which apparent noncompliance with physician's orders is merely lack of congruity between what a patient thinks he is supposed to do and what a physician thinks the patient is doing. Recognizing the importance of physician-patient interaction broadens the concept of patient compliance to one of physician-patient concordance.

Caplan (1979) discusses adherence and compliance defined as the extent to which a patient behaves in the manner prescribed by a health-care provider. Thus, a patient's behavior is judged by standards set by the provider, not the patient. Caplan (1979) concurs with Hulka et al. (1976) by stating that under conditions in which patient compliance is defined as goals set by the patient, by the provider, and jointly by patient and provider, the term concordance is a good description of agreement between patient and provider goals for the patient.

Stimson (1974) describes studies of patients' compliance with doctors' orders as viewing the ideal patient as passive, obedient and

unquestioning. Divergence from this ideal is seen as irrational, and the research problem is to find what there is about a patient that makes him a "defaulter." The question that has received the lowest priority is why people fail to follow doctors' orders. Stimson suggests that by viewing a patient as a responsible person, the following questions can be asked: What happens in the consultation between physician and patient when the decision to prescribe is made? What is the influence of the social context in which the patient lives? What is the patient's definition of the situation? Recognizing the patient as a decision making individual requires examination of the patient's perception of the situation and the personal and contextual factors influencing the decisions regarding carrying out the prescribed regimen.

The report by the Task Force on Consumer Health Education (Somers, 1976) reflects these concerns by suggesting that the high priority for research should be an understanding of the development of the health beliefs of the patient, with the key questions "What are the patient's perceptions?" The Task Force further notes that physicians employ strategies with each patient to motivate, educate, and interact with the patient in some way physicians perceive will improve the patient's health, but it is not known how the physician formulates such strategies. Understanding the perceptions of physicians and patients as they strive toward concordance is crucial to increasing knowledge of how patient education can positively influence patient behavior toward optimal health.

Purpose of This Study

Recognizing the problem of lack of patient adherence to prescribed medical regimens and the importance of physician-patient concordance in improving adherence, this study responds to the need for research examining both physicians' and patients' perspectives. The purpose of this study is

to compare how physicians and patients use information to judge the likelihood that a patient will carry out a prescribed medical regimen. Recognizing physician-patient negotiation and mutual decision-making as a means of increasing physician-patient concordance, it is useful to know whether physicians and patients share a common understanding of what factors influence the judgment of the likelihood that a patient will carry out a prescribed regimen. It is important to identify sources of conflict as a first step toward resolution of differences in striving for physician-patient concordance.

It is the premise of this study that in order to increase knowledge of how patient education can positively influence behavior toward optimal health, it is necessary to study what happens between physician and patient in the initial consultation. The physician-patient interaction is the beginning of the health education process, which in turn is the basis for behaviors leading to better health. Within this interaction, crucial judgments are made by both physician and patient as the health care problem and treatment are analyzed.

A Model for Studying the Physician/Patient Interaction. A physician takes the information available, analyzes it, and prescribes a plan of treatment for a patient. To what extent does a physician expect a patient to follow the plan? What pieces of information influence the judgment of the treatment a patient is most likely to follow? For example, does a physician consider the cost of a medication important in deciding what medication to prescribe and in judging the likelihood of a patient's buying the medicine and taking it? Does a patient view the situation in a similar way? To what extent does a patient expect to carry out the prescribed regimen? Does a patient use cues in a situation the same way as a

physician? For example, does a patient use the cost of a medication as a factor in deciding whether to buy and take the medicine as prescribed? Progress in negotiation may be unsuccessful because physician and patient fail to understand how the other feels about issues before them. Hammond, Wilkins and Todd (1966) have examined the process whereby two or more people learn about one another as a result of their mutual interaction, and have shown the importance of interpersonal understanding in successful negotiations. They have studied this process by using the lens model paradigm.

As developed by Brunswik and Tolman, the basic concept of the lens model (Hammond and Joyce, 1975) is that a person forms an inference about something which he cannot directly perceive (the likelihood of a patient's following the doctor's orders) on the basis of cues which he can perceive (cost and severity of illness). Thus, the lens model provides a means by which one can study the judgments of physicians and patients regarding the likelihood of a patient's carrying out a prescribed regimen because the lens model allows for examination of judgments based on inferences.

The lens model has the advantage of allowing for the study of relationships in a particular environment. Cohen (1979) suggests that comprehension of human behavior including adherence to a prescribed regimen, involves understanding events within a particular context. Petrinovich (1979) is concerned about the ability of the science of psychology to deal with significant behavioral issues at an adequate level of complexity. If we are interested in explaining how people behave in their environment, he suggests we will have to study the environment as carefully as we do the persons. Petrinovich (1979, p. 378) states that he considers Brunswik's (1952) lens model ".... to be the most adequate schema yet developed to describe behavioral episodes adequately, to conceptualize the focus of

existing theoretical concepts, and to lead to the development of theoretical conceptions at a level inclusive enough to preserve the complexity of behavioral systems." The lens model provides a means of representing how individuals use information available to them to make judgments. A judgment is defined as a cognitive process using information which is available to estimate or evaluate (Newell, 1968). This study will use the lens model paradigm as adapted by Hammond (Hammond and Joyce, 1975) as a basis for studying how physicians and patients use information provided to them to make judgments regarding the likelihood of a patient's carrying out a prescribed medical regimen.

An important aspect of lens model research is that it provides an overt representation of how individuals use information to make specific judgments. A physician and patient cannot directly perceive the likelihood of the patient's carrying out the physician's orders. There are, however, pieces of information or cues pertaining to the judgment which can be perceived. Examples of these cues are cost of treatment and severity of illness. These cues form the basis upon which a physician and patient make their judgments regarding the likelihood of the patient following the prescribed regimen.

Hammond has adapted the lens model to enable an investigator to focus on the interaction of two subjects, such as labor and management representatives, coping with a judgment task such as contract negotiation. By using the lens model, Hammond examined not only what the judgments of labor and management were, but also the importance each was attaching to major cues in the situation. Thus, sources of conflict could be identified which provided the first step toward resolution. Hammond's adaptation of the lens model is used in this study to focus on the interaction of the

physician and patient as they cope with the judgment of the likelihood of the patient's carrying out the physician's orders.

In order to use the lens model to study physicians' and patients' judgments, cues must be identified that are perceived and used by physicians and patients to infer the judgment of the likelihood that patients will follow medical regimens. Based on interviews, a review of literature, a pilot study and the experience of the researcher, cues thought to account for the greatest amount of variation in the judgment as to the likelihood of a patient's carrying out the prescribed medical regimen were selected for this study. The cues that have been identified for this study as being used by physicians and patients in judging the likelihood of a patient carrying out a physician's orders are: convenience, cost, severity of illness and support. These cues and the basis for their selection will be further discussed in Chapters II and III.

Based on Hammond's work and using these four cues, an instrument was developed and field tested to examine and compare physicians' and patients' judgments as to the likelihood of a patient carrying out a prescribed medical regimen. This instrument provides data to compare the judgments of physicians and patients and the importance physicians and patients place on each of the four cues in making that judgment.

Statement of Research Questions

The major question this study asks is: How do physicians and patients use information available to them to make a judgment as to the likelihood that a patient will carry out physician's orders? The general research questions are as follows:

1. Is there a difference between judgments of physicians and patients regarding the

likelihood that a patient will carry out a prescribed medical regimen?

- A. What is the judgment of physicians?
 - B. What is the judgment of patients?
 - C. What is the relation between the judgments of physicians and patients?
2. To what extent can the cues convenience, cost, severity of illness and support be used to predict the judgments of physicians and patients regarding the likelihood of a patient carrying out a prescribed medical regimen?
3. Is there a difference between physicians and patients in the importance each attaches to convenience, cost, severity of illness and support in making a judgment as to the likelihood that a patient will carry out a prescribed medical regimen?
- A. What importance do physicians attach to the four cues?
 - B. What importance do patients attach to the four cues?
 - C. What is the relation between the importance physicians and patients attach to the four cues?
4. To what extent is demographic data useful in predicting judgments of physicians and patients, the importance attached to the four cues in making the judgments, and the amount of variation accounted for in making those judgments?

Definition of Important Terms

The following definitions for key terms to be used in this study provide a common basis for understanding.

1. Judgment. Johnson (1972) defines judgment as the assignment of an object to a small number of specified categories in order to settle an uncertain state of affairs. More specifically, Johnson (p.340) states that "...judgment begins with unordered objects, events, or persons, assigns them to specified response categories so as to maximize the correspondence between the response and the critical dimension of the stimulus objects, and thus ends with a more orderly situation." Newell (1968) defines judgment as a phenomenon; a cognitive process using information which is available to estimate or evaluate. This study will use Newell's definition of judgment as a functional aspect of thinking that allows persons to cope with uncertainty by providing the psychological means of going beyond that which can be perceived and known while maintaining organization and continuity in behavior.
2. Cues. Factors or information that can be perceived in a judgment situation and assumed to account for the greatest amount of variation in a judgment are defined as cues. In this study of the judgment of the likelihood that a patient will follow doctor's orders, the specific cues are convenience, cost, severity of illness and support.

3. Weight assigned to cues. The weight for a cue indicates the importance a person places on the cue when making a judgment. This study speaks of two types of weights, defined as follows:
 - A. Beta weights-weights obtained by statistical analysis of data using multiple regression.
 - B. Subjective weights-self reported percentages of importance placed on each of the four cues in making the judgment.
4. Cognitive feedback. This is a form of feedback which enables the person to compare the properties of his or her cognitive system (that is, how the individual is using the cues in a judgment) with the properties of the task system with which the individual is trying to cope. The task system may be the content of the task or how another person is using the cues in making the same judgment (Hammond and Summers, 1972). In giving feedback on the content of the judgment task, the difference between the weight or importance the person is attaching to certain cues and their actual importance in the judgment task is presented. When the task involves two or more persons in the same situation, the weight or importance one person is attaching to cues as compared to the importance another person is attaching to the cues can be pointed out. This is contrasted to outcome feedback in which the person is simply told whether the judgment agrees or disagrees, is right or wrong. An example of cognitive feedback in a labor-

management negotiation would be to inform management that they were using salaries as the most important cue in the situation, and inform labor that they were placing most importance on fringe benefits.

5. Policy. In this study, policy is used to describe a cognitive system, that is, "Any minimally organized set of relationships between an individual's judgments and the information ('cues') on which the judgments are based" (Rappoport and Summers, 1973, p.4). This term is frequently used in the phrase "judgment policy" or "policy capturing."
6. Physician-Patient Concordance. For this study, physician-patient concordance is used as Hulka et al. (1976) defined the term, that is, congruence between what the patient thinks he is supposed to do and what the physician thinks the patient is doing. This definition implies shared responsibility for adequate communication and awareness between physician and patient in addressing the issue of a patient's following a prescribed medical regimen.
7. Compliance. Patient compliance refers to the extent to which a patient adheres to a prescribed medical regimen. It is recognized that this term denotes patient subservience and stands in contrast to the philosophy of health care upon which this study rests, that of shared responsibility between health care providers and patients. However, it is the predominant term used in the literature and it is used in this study when it is judged the

appropriate word to accurately communicate the relevant research upon which this study is based.

Plan for This Study

Chapter II presents a review of the literature in two major areas. Health education literature related to compliance is reviewed in relation to the current state of knowledge, general determinants of patient compliance with therapeutic regimens, and specific determinants used for this study. Literature related to judgment theory is reviewed in relation to the lens model and its use in studying judgments.

In Chapter III, the procedures used in the study including subjects, research design, instrumentation, and data collection are discussed. Also, the research questions are defined, analysis of data is described, and a brief description of the pilot study is given.

The results of analysis of the data from this study are reported and discussed in Chapter IV.

Finally, Chapter V presents a summary of the study, limitations, conclusions, implications, and recommendations for future research.

CHAPTER II
REVIEW OF THE LITERATURE

CHAPTER II

REVIEW OF THE LITERATURE

The theoretical basis of this study is formed by bringing together the literature from two areas, health education and judgment theory. Health education literature on compliance is reviewed. Judgment theory and application of the lens model to the study of physicians' and patients' judgments of the likelihood of a patient's carrying out a prescribed medical regimen is also reviewed.

A discussion of methodological problems of compliance research is first presented to provide a basis for reviewing and comparing studies examining factors related to compliance. Next, health education literature is explored to find determinants of patient compliance. After a general review, specific cues used in this study of judgment of the likelihood of a patient's carrying out a prescribed regimen are identified and discussed. Finally, a review of judgment theory is presented with a focus on the lens model, its use in a variety of settings, and its potential use in understanding and comparing differences in judgments of physicians and patients regarding patient adherence to a prescribed regimen.

Health Education-Compliance

State of Knowledge

Numerous studies have been carried out in the area of patient compliance with therapeutic regimens. In order to use and compare findings from these studies, it is necessary to understand the methodological problems related to this research area. Compliance and noncompliance

are highly complex behaviors, and currently there are large gaps in the information base and serious questions regarding methodological procedures. In the following paragraphs, a review of the methodological problems of compliance research is given, including the procedures used in studies to measure compliance. This is followed by evaluation of recent patient education efforts.

Gordis reviewed the methodology of the literature on compliance in 1976 and 1979. He noted that comparisons of compliance studies are difficult because of variation in the definition of compliance and in selection of cut-off points for distinguishing compliant from noncompliant behavior. Noncompliance can be manifested by behaviors such as delay in seeking care, breaking of appointments, and failure to follow physicians' instructions. The definition and cut-off points used has varied with the researcher or clinical objectives of the individual investigation, and this lack of uniformity makes it difficult to summarize and compare studies.

The measurement of compliance is either direct, such as with levels of a drug in the blood or urine, or indirect, such as interview or pill count. Gordis (1979) has raised methodological issues about each of these methods. For example, in the direct method, differences in the drug and differences in the individual must be accurately determined in order to interpret the drug level in the urine correctly. Also, the potential effect of the measurement of compliance itself on the patient's compliance behavior must be considered. Another issue is whether patients are characterized on the basis of a single test or on the basis of periodic testing. There is a question of whether compliance levels remain constant for a given patient over time, and thus whether one can justify characterizing a patient as a complier or noncomplier. Furthermore, in direct

measurements of compliance, the setting in which the tests are carried out--the home, clinic, or hospital--may be cause for concern in evaluating a study.

Gordis (1976, 1979) voiced concern also about indirect measures of compliance. A frequently used indirect measure is outcome, based on the premise that the recommended regimen, if adhered to, is truly effective. However, some components of effective medical care are not a result of adherence to a medical regimen. For example, a hypertensive patient may receive reassurance by the physician with consequent reduction of stress, which may have a beneficial effect. Thus, the outcome of this patient may be a product of the behavior of taking the antihypertensive medication combined with the reassurance. Further, a patient may have multiple aspects to the treatment program, and may carry out some aspects and not others. A good outcome could result even with failure to adhere to parts of the regimen. External factors such as socioeconomic and cultural factors may also affect the outcome as well as compliance itself. Gordis concluded that the relationship of compliance to outcome becomes increasingly complicated and differences in outcome are, in general, of limited value as measures of patient compliance.

Gordis (1976, 1979) examined three other indirect measures of compliance; the pill count, physician assessment of compliance, and the interview. The pill count, or comparing the amount of medication remaining in a patient's bottle to the calculated amount that should remain if the drug had been taken as prescribed, has been frequently used to assess medication behavior. Gordis found the comparative data on the validity of pill-counts suggested serious problems of overestimation. Such problems might particularly be expected when the medication is one that might be used by other members of the family, such as tranquilizers,

antacids, or antibiotics. Gordis also examined the physician assessments of compliance. Data from studies indicated that physicians' estimates of compliance were so inaccurate that they were suggested to be of very limited value not only in research studies of compliance, but even in practical applications in delivery of health services.

Feinstein (1979), in reviewing types of data that can be used to measure compliance, stated that the best way of finding out what a patient has done is to ask the patient. He suggested that for collecting the complete data necessary to evaluate compliance, a well-constructed interview cannot be replaced by any of the available objective data. Recognizing that the interview is a subjective measure, the interview technique is often used with an objective technique to verify the patient's reliability. Sackett, Haynes, Gibson, and Johnson (1976), and Sackett, Taylor, Haynes, Gibson, and Johnson (1978) compared interviews and pill counts and found that it was difficult to know if patients who deny problems with low compliance were telling the truth. Further, Sackett (1979 a, 1979 b,) found that patients who admitted low compliance showed the greatest response to compliance improving strategies in reaching treatment goals.

While the validity of the interview is questionable, its usefulness may depend on the objective of the interviewer. If the primary objective is to identify noncompliers, Gordis (1979) noted that many can be identified by the interview measure. In conclusion, Gordis reported that the present state of knowledge does not permit a valid comparison of different approaches to the measurement of patient compliance.

Concern for methodological problems was reflected in a review of compliance literature carried out by Sackett and Haynes in 1976 and

updated in Haynes, Taylor and Sackett in 1979. Haynes et al. (1979) dealt with the problem of methodology by scoring a methodological profile of each of 853 studies in their review of literature of compliance. However, many studies, including those reviewed by Haynes et al., were carried out in a pediatric setting in which compliance was the parents' compliance in seeing that the child received the appropriate regimen. Findings of these studies of parents were used as data on compliance and compiled along with studies done only on adults. It is questionable that the judgment a parent makes in whether the child will receive the prescribed regimen is the same as the judgment an adult makes as to whether to carry out the prescribed regimen for himself. However, Haynes et al. (1979) have provided a thoughtful review and methodological critique of the current literature related to compliance.

The concern for the methodology of research in patient education is shared by Green, Squyers, D'Altroy and Herbert (in press). They attempted to learn what recent evaluations of patient education efforts were saying by reviewing the published literature from 1974-1978. From 67 computer generated references on patient education and evaluation, 15 were not evaluation studies, but described features of a program. Another 21 were not reports of patient education efforts, but of staff education programs. Thus, less than one third of the references actually were of patient education programs that included an evaluation component. After analyzing the studies, Green et al. (in press) identified these common pitfalls in patient education diagnosis, planning, implementation, evaluation and analysis:

1. Oversimplifying the behavioral tasks. The literature demonstrated a tendency for clinicians and evaluators to over-simplify the multiple influences of attitudes,

beliefs, values, perceptions, social supports, physical barriers, financial barriers, and the behaviors of health providers on the patient's health behavior.

2. Atheoretical assumptions about cause. Assumptions as to why methods or programs had certain outcomes usually were not tested, seldom related to formal theory, and often were not even made explicit so that they could be questioned.
3. Evaluating one education technique or method by comparing it with the absence of technique or method. Health education theory has warned that no single educational input alone should be expected to have significant lasting impact on health behavior and has suggested that evaluations be designed to test multiple methods in a comprehensive program.
4. Preoccupation with one method or medium. Health education theory and research suggested that the best combination of educational methods, media, and messages for patients in one setting and from one population does not guarantee success with all patients in all settings.

Finally, Green et al. (in press) stated that "One conclusion that is safely drawn from the literature on health behavior and behavior change is that there are no universal determinants of success. There is no formula for behavior change that is universally applicable for all populations, settings, health problems, or health behaviors."

These reviews by Gordis (1976, 1979), Sackett and Haynes (1976), Haynes et al. (1979) and Green et al. (in press), have two major

implications for this study. First of all, these reviews have shown the difficulty of comparing studies in order to identify the most important determinants of compliance or health behavior. Use of the lens model paradigm requires that the factors thought to account for the greatest amount of variation in the judgment be identified. Recognizing the limitation of the literature, choice of factors for this study was based on a literature review as well as a preliminary survey of health care professionals and patients, and a pilot study of an instrument using the four cues identified. The literature review will be discussed in this chapter, and the preliminary survey and pilot study will be discussed in Chapter III.

These reviews have a second implication for this study. Examination of methodologies for studying compliance did not reveal a focus on the cognitive aspects of decision making and judgments. Therefore, application of judgment theory based on the lens model should make a useful contribution to the study of patient adherence to a prescribed medical regimen by providing a different perspective from which to address the problem.

Summary. Many of the health education studies related to compliance are of questionable methodology according to Gordis (1976, 1979) with the major questions involving the definition of compliance, the selection of cut-off points for distinguishing compliant and noncompliant behavior, and means of measuring compliance. These problems make comparisons of studies very difficult. Further, an evaluation of current patient education literature was carried out by Green et al. (in press). The major conclusion drawn from the literature at this point is that there is no one formula for behavior change that can be universally applied.

Based on these studies, the implications for this research are twofold: (1) Due to methodological problems, the usefulness of comparing studies to identify the most important determinants of compliance is limited. Therefore, choice of factors for this study was based on a literature review as well as a preliminary survey of health care professionals and patients, and a pilot study of an instrument using the factors identified. (2) Methodologies currently used to study compliance do not appear to include decision making and judgment theory. Therefore, this research based on the lens model should make a contribution by providing a unique and useful perspective to study patient adherence to a prescribed medical regimen.

Determinants of Patient Compliance with Therapeutic Regimens

In order to use the lens model for this study, cues used in the judgment of the likelihood of a patient's carrying out a prescribed regimen must be identified. Therefore, the following paragraphs present a general review of studies examining determinants of patient compliance. This is followed by a summary of the studies relating to each of the four cues used in this study. The literature related to the general determinants of patient compliance are reviewed in three major areas: (1) features of disease and therapeutic regimen, (2) demographic and sociobehavioral features of the patient, and (3) features of the provider and patient-provider interaction.

Features of disease and therapeutic regimen. In 1970, Marston reviewed the literature concerned with the relation of severity of illness and compliance, and found an absence of any association. In 1979, Haynes reviewed studies to determine the associations between compliance and features of disease such as diagnosis, severity, duration, degree of

disability, and symptoms. Again, severity was shown not to be a factor related to compliance. It should be noted that severity of illness used as a factor in the studies reviewed by Haynes and Marston was the severity as defined by the physician or health care provider. Severity of illness as perceived by the patient has been shown to be associated with compliance, and is discussed under sociobehavioral features of the patient. Overall, Haynes (1979) found few associations between features of disease and compliance, with the following exceptions: (1) compliance was lower among patients with a psychiatric diagnosis; (2) increasing symptoms may be accompanied by decreasing compliance; and (3) increased disability may be associated with increased compliance.

Hulka, Kupper, Cassel, and Efird (1975) and Hulka, Cassel, Kupper and Burdette (1976) described an extensive study focusing on the impact of medication regimen and doctor-patient communication in affecting patient medication-taking behavior and physician awareness of these behaviors. Their subjects were 357 people diagnosed as having diabetes and/or congestive heart failure. Medication errors averaged 58% with a higher number of errors associated with increased number of drugs involved and complexity of the regimen. They found that the categories of drugs associated with excess medication-taking errors were primarily central nervous system drugs (chiefly tranquilizers), as well as antibiotics, antihistamines and drugs taken for relief of gastrointestinal distress. Since the measurement used for the study was pill-count, it is interesting to note the relation of this finding with Gordis' previously cited concern that these types of medication might be subject to use by other members of the family. Hulka et al. (1975) also noted that cardiac drugs and anti-diabetic agents, which have the greatest effect on the patient's medical status (and are least likely to be used by others), were subject to less

than the average amount of medication-taking error. Hulka et al. (1975) further noted that severity and duration of disease, and number of concurrent conditions, did not appear to be associated with medication-taking errors.

Davis (1967) reported an early study involving a sample of approximately 400 farmers with heart problems who were part of the Purdue Farm Cardiac Project. The study covered four years and measurement of compliance was self-report. Davis found that the greatest number of patients (42%) complied with two of the three regimens prescribed and only 9% complied with all three. Those who complied with one of the three regimens chose work most often, and those who complied with two chose work and diet. Changes in personal habits such as smoking, drinking, and rest seemed the most difficult. It is interesting to note that Davis uses Festinger's (1957) theory of dissonance to explain noncompliance, that is, to reduce dissonance, an individual will choose to comply with those changes which necessitate the least amount of change in his life. This is consistent with Gillum and Barsky's (1974) conclusion upon reviewing the literature. They noted that an individual is most likely to comply with those aspects of the regimen that are least difficult and disruptive of preexisting behavior. Individuals may adopt only a portion of their therapeutic regimen, picking that which is least difficult for them. Haynes (1976a) noted that compliance by patients who must acquire new habits is much greater than that exhibited by patients who must alter old behaviors. Further, those who must change personal habits such as smoking are least likely to adhere to a prescribed medical regimen.

Marston (1970) in a review of literature also reported that an increasing number of recommendations had been found to be associated with increasing noncompliance, and the longer patients remained under

treatment, the less likely they were to comply. Weisenberg (1977) summarized the literature by noting that the factors related to compliance include the time required, the number of doses of medication per day, the number of medications per day, and the complexity of the regimen.

Finally, Haynes (1979) reviewed studies associating compliance with features of the therapeutic regimen such as type of treatment, complexity, duration, cost, and side effects. These findings concur with the studies cited with one exception. Haynes (1979) stated that the number of times per day medication is to be taken has not been clearly determined to influence compliance. This contradicts Weisenberg's (1977) statement. However, Haynes (1979) agreed that regimens that require more extensive changes in lifestyle reduce compliance, as do more complex regimens and the continuation of therapy over time. Surprisingly, side effects do not appear to have an important effect on compliance. Haynes (1976a, 1979) reported mixed findings on the effect of financial cost on compliance, and noted a lack of studies looking at both direct and indirect costs of therapy.

Military medicine brings an interesting perspective to the cost of medical care since military personnel receive medical care at minimal or no cost. A mailgram sent to 2719 beneficiaries of military health care found 817 (30%) who had to or preferred to obtain medical care outside the military system, thus incurring personal cost (Comptroller General, 1979). Financial cost was not found to be a major concern of most military beneficiaries going elsewhere for care.

With respect to appointment keeping, Haynes (1979) noted convenience of the clinic, especially waiting time, appeared to have a strong association with compliance of appointment keeping. This finding was confirmed by Finnerty (1979). By decreasing time spent in a hypertension clinic from an

average of 4 hours to 15-20 minutes, the drop-out rate was reduced from 42% to 4% in just 2 years.

Summary. In examining features of disease associated with compliance, severity as defined by the health care provider was consistently shown not to be a factor influencing compliance (Haynes, 1979; Marston, 1970). In general, disease features were not important determinants of compliance with the following exceptions (Haynes, 1979): (1) compliance was lower among patients with a psychiatric diagnosis; (2) increasing symptoms may be associated with decreasing compliance; and (3) increased disability may be associated with increased compliance.

In studying features of a therapeutic regimen associated with compliance, the following factors were consistently noted to be related to compliance (Marston, 1970; Hulka et al., 1975, 1976; Weisenberg, 1977; Haynes, 1979): (1) time required of the treatment program, (2) number of medications per day, and (3) complexity of the regimen. Haynes' (1979) and Marston's (1970) reviews of literature indicated that the longer patients remained under treatment, the less likely they were to comply. The amount of lifestyle change required by the medical regimen was also consistently identified as an important determinant of compliance (Davis, 1967; Hulka et al., 1975, 1976; Gillum & Barsky, 1974; Haynes, 1976a, 1979). In general, an individual is most likely to comply with those aspects of the regimen that are least difficult and disruptive of pre-existing behavior. With respect to appointment keeping, Haynes (1979) and Finnerty (1979) noted convenience of the clinic, especially waiting time, appeared to have a strong association with compliance of appointment keeping. Surprisingly, side effects do not appear to have an important effect on compliance (Haynes, 1979).

Finally, findings have been inconsistent in identifying an association between cost of treatment and compliance, and between number of doses of medication per day and compliance. Cost was examined by military medicine and financial cost was not found to be a major concern of most military beneficiaries going outside the military system for care (Comptroller General, 1979). Haynes (1976a, 1979) reported mixed findings on the effect of financial cost on compliance, and noted a lack of studies looking at both direct and indirect costs of treatment. The number of doses of medication was cited as an important factor related to compliance in Weisenberg's (1977) review of research. However, Haynes' 1979 review of literature stated that the number of times per day medication is to be taken has not been clearly determined to influence compliance.

Demographic/Sociobehavioral Features of Patients. Many studies have examined the association of demographic characteristics such as age, sex, education, and income with compliance. Marston (1970) reported in a review of literature that demographic variables, when examined apart from other variables, have rarely been predictive of compliance with medical regimens. She notes that in the few instances where these variables appear to have an influence, other variables, e.g. use of mild threat, probably exerted an additive or interaction effect.

Hulka et al. (1975) reviewed age, sex, marital status, education, social class, current activity, and presence of spouse in the household and found none of these variables showed a marked association with compliance. Haynes (1976a) noted that few studies have found any association between demographic factors and compliance or noncompliance. Further, he observed that most of the studies were performed among clinic-based populations with subjects who had successfully entered the health care system,

and the effect of demographic data may be much greater upon access to health services than upon compliance among patients already in the health care system. Becker (1979, p.5) reviewed the literature on compliance and noted "The major lesson of these findings is that non-compliance is commonly found among patients of all demographic, personality and social types."

An interesting finding in the literature is the lack of association between knowledge of disease and treatment and compliance. The assumption that knowledge is a necessary and perhaps sufficient factor in promoting compliance has not been shown in the research. In 1970, Marston reviewed the literature and found that knowledge regarding illness and its treatment did not necessarily lead to compliance, although occasional studies had reported an association. Bille (1977) examined the possible relationship between knowledge of disease and compliance with post hospitalization prescriptions. He compared the effectiveness of structured and unstructured patient education by using an experimental and control group design of 12 patients in each group. His research showed that patients learn nearly as well in an unstructured as a structured setting, but perhaps more important, it showed that compliance was not significantly related to the patient's knowledge about his disease entity. While the sample size is certainly a limitation of his study, the findings are consistent with other studies.

Recent studies have indicated that in some situations, knowledge may have an unexpected effect on behaviors of individuals. Haynes et al. (1978) studied hypertension in an industrial setting and found that labeling of hypertension resulted in increased absenteeism from work. Absenteeism rose among those previously unaware of their condition, regardless of whether antihypertensive therapy was begun. Johnson (1979) presented the results of a survey of hypertensive patients in a family

medicine practice. He found that anxiety and fear of the complications of hypertension were associated with poor blood pressure control. Alternative hypotheses other than knowledge having a negative effect could certainly be suggested for both of these findings. However, they do suggest caution be exercised in designing patient education programs to insure that they are not only informationally accurate, but also theoretically and conceptually sound according to the principles known in the fields of education and psychology.

Others have noted in the literature that the role of knowledge of disease and compliance is inconclusive with the present state of research. In 1976 (a) Haynes reported that studies concluding no relation between knowledge of disease and compliance were of greater methodological soundness than those stating a relation. He concluded from the studies that there was no relation between patients' compliance and knowledge of the disease therapy. Haynes (1976b) commented that while it was obvious that a patient who does not know the therapeutic instruction could not comply, it was becoming equally clear that few patients failed to comply because they lacked knowledge or intelligence. This is congruent with Green's statement (1980, p.72) that "Knowledge is a necessary but not sufficient factor in changing health behavior." Hogue (1979) reviewed a variety of nursing studies relating health teaching to compliance, and asserted that it was clear that transmitting information alone was not enough to overcome noncompliance. She cited Powers and Ford's (1970) observation that studies of nursing interventions have shown that effective interventions must be based not only on knowledge per se, but also knowledge of the way the patient defines the situation. This observation supports the purpose of this study which examines and compares the importance patients and physicians place on information related

to the judgment of the likelihood of a patient's adhering to a prescribed regimen. Results of this study not only contribute knowledge of how the patient defines the situation but also how the physician defines the situation, and the congruence or lack of congruence between a physician and a patient.

The influence of family and friends on patient compliance has been examined with inconsistent findings. Weisenberg, (1977) in her review of literature, concluded that patients with stable and cohesive family backgrounds and patients who have help available in the community were more likely to comply with prescribed regimens. Vincent (1971) studied variations in the behavior of conforming and nonconforming medically diagnosed individuals with reference to a "sick role" construct. Her findings suggested that the importance of the influence of family members in encouraging or discouraging compliance was suggested by the data. Haynes' review (1976a) reflected these findings by noting that compliance was higher among patients with "supportive" intact families and lower among those from unstable families.

A review of the literature of 19 studies of social support and dropping out of treatment found that dropping out was associated with low social support in all 19 studies. These studies covered a range of health problems including alcoholism, high blood pressure, and psychiatric illness (Baekland and Lundwall, 1975). Kasl (1975), however, found conflicting evidence in the relation of sociodemographic variables to compliance, and concluded that if there was an association, it was in fairly specific ways which represented interaction with other variables. For example, Kasl cited a study by Guilford (1972) which found that with individuals trying to stop smoking, a wife's disapproval of smoking increased chances of success for the husband, but women smokers were

unaffected by their husband's disapproval, and disapproval from friends and relatives actually increased their chances of failure. Charney (1972), in a review of the literature reported that size of the family, its cohesiveness and stability, and its "ethnocentricity" did correlate well with whether a patient would seek medical care. However, once the care was started, the influence became blurred.

Caplan et al. (1976) reviewed the literature related to social support and adherence. They observed that most studies did not clearly define social support nor detail the mechanism by which it is expected to act on adherence. Caplan and his colleagues designed a study to improve adherence to a treatment program for hypertension through the use of patient education and social support. The experimental interventions were lecture and social support. The investigators concluded that both experimental groups were superior to the control group, and offer the interpretation that the lecture group had been run in a very supportive manner.

Becker (1979) summarized his review of literature by suggesting that the effect of family and other support systems on the patient's adherence to the regimen is likely to be of tremendous importance, and should be a focus of future research. Thus, while far from conclusive, the literature suggests that compliance is higher among patients with "supportive" intact families, and the specific influences of family and friends on compliance needs further investigation.

The Health Belief Model. One interesting attempt to explain health behavior of individuals is the "Health Belief Model" (Rosenstock, 1974, 1975). The model was originally developed to explain preventive health behaviors such as obtaining immunizations or screening for a specific disease. Subsequent studies have attempted to suggest that it is an

adequate explanation of compliance with a prescribed medical regimen. This model contains the following three elements (Becker, 1976):

1. The individual's evaluation of the perceived likelihood of susceptibility to a particular illness and perception of the probable severity of the subsequent disease.
2. The individual's evaluation of the feasibility and efficacy (estimated benefits in reducing susceptibility and/or severity) weighed against estimates of costs or barriers to the proposed behavior such as physical, psychological and financial.
3. A "cue to action," either internal (perception of body state) or external (e.g. interpersonal interaction) to trigger the health behavior.

Becker (1976, 1979) has presented data to support the influence of these components of health behavior. An argument consistent with other reviews of literature (Sackett and Haynes, 1976; Weisenberg, 1977) is the assertion that perceived severity is associated with compliance.

Christensen (1978) reviewed the literature related to the Health Belief Model and observed that there was accumulating evidence in support of the model. He noted that an association between perceived severity of an illness and compliance has been found consistently in studies, but this association is not consistent for all types of health actions or for all levels of severity. Becker (1979) recognized the mixed findings of recent studies of perceived severity and compliance, and suggested that the presence or absence of symptoms and characteristics of the prescribed regimen may be important in understanding the relationship between perceived severity of an illness and compliance.

Other recent studies using the Health Belief Model have reported contradictory results. Hogue (1979) reviewed nursing studies testing propositions from the Health Belief Model as they related to compliance and preventive health care. The studies covered a variety of health behaviors including breast self exam, giving up smoking, taking medications, and mothers obtaining immunizations for children. These studies found little or no relation between the health behaviors and the Health Belief Model. Sackett (1978) points out that most attempts to validate the Health Belief Model have been retrospective, that is, current health beliefs have been compared with past compliance, usually with positive results. However, more recent prospective studies have produced results suggesting that health beliefs may result from health related behaviors rather than cause them. This was demonstrated in a study of antihypertensive therapy (Taylor, 1979) in which some beliefs of patients who were adhering to the prescribed regimen actually changed to coincide with compliance (for example, after 6 months of adhering to a regimen patients began to perceive hypertension as a serious disease that benefitted from drug therapy). Taylor (1979) found that after patients had gained some experience with a treatment program, the health belief scales together explained 15% of the variance in compliance. However, he also noted that simply asking the patient to estimate his own compliance accounted for 52% of the variance.

Leavitt (1979) examined the influence of health beliefs on use of ambulatory care services using both prospective and retrospective data. He found the patient's perception of vulnerability to illness the best predictor of illness-related use, with perception of benefits derived from preventive health the only other attitude to contribute significantly to the variance. The least salient attitude was seriousness of illness, a

finding in contrast to Sackett and Haynes (1976) and Weisenberg (1977). It was interesting to note that Leavitt found strikingly similar results using retrospective and prospective data. This findings conflicts with Sackett's (1978) conclusions and Taylor's (1979) findings, but it must be recognized that Leavitt's study addressed an issue different that compliance, that is, the use of health care services. Also, it should be noted that the participants in the study were employees of a large medical center with guaranteed access to health care in a health maintenance organization. This pattern of care is clearly not representative of the typical health care delivery system.

Using the Health Belief Model, a preliminary report has been done on a descriptive phase of a long term study regarding patient adherence to antihypertensive medical regimens at University of Michigan (Kirscht and Rosenstock, 1977). This preliminary study was an attempt to demonstrate that the Health Belief Model can explain some factors that account for adherence. Specifically, the model as used in the study hypothesized that the degree of adherence to a regimen is related to (p. 116):

1. The patient's belief regarding his personal status in relation to hypertension and his belief about his personal vulnerability to the consequences of hypertension, such as heart disease, stroke, and kidney disease;
2. His beliefs about the negative impact of hypertension, itself, or its sequelae, on his life;
3. His beliefs about the effectiveness of compliance with medical regimen in regard to reducing the threats of the condition; and
4. Beliefs about the psychological costs that may be associated with following the regimen when balanced against the benefits. Among the psychological costs considered are the economic costs, certain convenience factors, the severity of side effects, and the efforts necessary for compliance.

Results of the study were difficult to interpret due to its preliminary nature, but demonstrated that the Health Belief Model could explain some factors that account for adherence. Kirscht and Rosenstock's study provides support for examining cost, convenience and severity of illness as factors in the judgment of the likelihood of the patient carrying out the prescribed medical regimen. Further, Becker (1976, 1979), in discussing the Health Belief Model has recognized the patient-practitioner relationship as an important additional variable in predicting compliance. The Health Belief Model has stimulated ideas and theoretical constructs for this study. It is suggested that the present study of the physician-patient judgments has the potential for making a contribution to the theory of the Health Model in two ways. First, information from this study related to the importance physicians and patients place on convenience, cost, severity and support in making judgments about patient adherence to a prescribed regimen may be useful in better understanding the roles of these factors in the Health Belief Model. Second, by comparing the importance physicians and patients place on the cues and by comparing their judgments, information may be obtained that is useful in better understanding the association of patient-practitioner relationship to the Health Model.

Summary. Demographics were not found to be associated with compliance. Surprisingly, knowledge of disease and treatment has also been reported as not associated with compliance. The findings examining the influence of family and friends on compliance were not conclusive, but suggested that compliance was higher among patients with "supportive" intact families, and that the specific influences of family and friends on compliance need further investigation.

Finally, the Health Model is described as an interesting psychological model used to explain and predict compliance. The three elements of the model are (Becker, 1976):

1. The individual's evaluation of the perceived likelihood of susceptibility to a particular illness and perception of the probable severity of the subsequent disease.
2. The individual's evaluation of the feasibility and efficacy (estimated benefits in reducing susceptibility and/or severity) weighed against estimates of costs or barriers to the proposed behavior such as physical, psychological and financial.
3. A "cue to action," either internal (perception of body state) or external (e.g. interpersonal interaction) to trigger the health behavior.

Kirscht and Rosenstock (1977) have done a preliminary study which demonstrated that the Health Belief Model can explain some factors that account for adherence. Among the psychological costs identified for the study as associated with following the regimen were the economic costs, certain convenience factors, the severity of side effects, and the efforts necessary for compliance. Further, Becker (1976), in discussing the Health Belief Model recognized the patient-practitioner relationship as an important additional variable in predicting compliance. Recent studies of the Health Belief Model have provided mixed findings. Sackett (1978) suggested that most studies validating the Health Belief Model have been retrospective studies. He noted that more recent prospective studies have suggested patients' health beliefs may result from rather than cause compliance. The Health Belief Model stimulated ideas and theoretical constructs for the present study. The study of physician-patient judgments as proposed has the potential for making a contribution to the theory of the Health Belief Model in two ways: (1) by providing information useful in better understanding the importance of convenience,

cost, severity and support as factors in the Health Belief Model and its use in predicting health behavior; (2) by comparing the importance physicians and patients place on the cues and by comparing their judgments, information may be obtained that is useful in better understanding the association of patient-practitioner relationship to the Health Belief Model.

Features of the Provider and Patient-Provider Interaction. Haynes (1976a) noted that very few investigators have studied the physician-patient interaction from the viewpoint of compliance, and the information available is mostly circumstantial, highly subjective and of uncertain validity. He did report two findings. First, the degree of supervision and compliance has a positive association, that is, hospitalized patients are more compliant than out-patients. Second, the patients stated level of satisfaction with the provider and clinic is correlated with compliance, and compliance is positively associated with patients' conclusions that their expectations have been met by their provider. Haynes (1976b) noted that "the understanding of specific elements of patient-therapist interaction must await the further development and application of methods of interactional analysis" (p. 35).

Most studies in the literature reflect the very general nature of findings as Haynes suggested. Marston (1970) noted that although the importance of physician-patient relationship in promoting compliance had been emphasized by several investigators, with the exception of Davis, (1968), the nature of this relationship had not been spelled out. Weisenberg (1977), in her review of literature lists the following factors among those related to compliance; a warm doctor-patient relationship, providers that communicate well, and providers that meet patient expectations and make the patient feel important.

Talkington (1978), in an experimental study involving 153 patients in a family practice setting, reported similar findings. He found that patients reacted more favorably to the personal interaction and support involved in the experimental treatment, than to the facets of the procedure such as clarification of the physician's recommendation or supplemental materials.

Specific aspects of physician-patient interaction were addressed by Davis (1968), Kleinman, Eisenberg, and Good (1978), and Hulka (1979). One important aspect Davis (1968) addressed is the reciprocity necessary in the provider-patient situation. When doctors fail to clearly convey the significance of a regimen to the patient, there is a reciprocal failure on the part of the patient to comply. Furthermore, when physicians seek information from patients without giving them any feedback, the patient is unlikely to follow the physician's orders.

Kleinman et al. (1978) pointed out that clinical reality is viewed differently by doctor and patient. Discrepancies in views strongly affect clinical management. The interplay between patient and practitioner shapes the clinical reality that is negotiated in medical practice. Kleinman noted that part of systematic clinical practice should be an attempt to make explicit the doctors' and patients' beliefs and value systems relevant to the issues of clinical concern. Comparison can identify where discrepancies lie and whether they affect care so that negotiations can take place. Kleinman et al. (1978, p. 257) concluded that this process of negotiation may be the "...single most important step in engaging the patient's trust, preventing major discrepancies in the evaluation of therapeutic outcome, promoting compliance, and reducing patient dissatisfaction."

Hulka (1979) looked at the association between doctor-patient relationship and drug error rates with doctor-patient relationship defined as consisting of three components. These components were labeled communication between physician and patient, physician awareness of patient concerns, and patient satisfaction. She found no association between overall communication and drug error rates for diabetics, but she found a clear association of increased error with decreased level of communication among congestive heart failure patients. The association between patient satisfaction and drug error rates did not reach statistical significance. Physician awareness of patient concerns demonstrated no association with drug error rates, and Hulka does not reveal the degree to which physicians were actually aware of patient concerns.

Since physician-patient interaction is crucial to patient education and health promoting behaviors, the literature was examined for the patient's perceptions of the physician and the physician's perceptions of the patient. Roter (1977) accurately pointed out that the great majority of compliance studies have emphasized the communication from the provider to the patient, but few studies have analyzed the two-way process of interaction between the patient and provider. This view is supported by Stimson (1974) who stated that the research problem regarding compliance has been one of finding out what there is about the patient that makes him a "defaulter." He suggested an alternative research approach from the perspective of the patient in which the focus is on the social context in which illnesses are lived and treatments used. Sackett (1979) stressed the need to identify the determinants of the perception of one's own compliance and see if they are the same for all regimens. This study may contribute to the identification of the determinants of the perception of a patient's own compliance related

to a specific regimen prescribed for hypertension.

There have been some studies and discussions of perceptions of physicians and patients in the literature. Barsky (1976) suggested that a patient and physician have differing views of the patient's problem and the most desirable therapeutic regimen. He concluded that for a patient to participate optimally in his own care, differences in the patient's and physician's perspective must be made overt and explicit. Blackwell (1969) cited a study which compared patient's expectations of physician's role behavior with the patient's descriptions of the physician's actual role. It was concluded that a lack of congruence between expectations and behavior prevent a physician-patient relationship from operating with optimal stability and effectiveness. In an editorial, Meenan (1976) asserted that doctors assume the high priority they place on health should be shared by others, and individuals who do not share this value are pejoratively labeled "noncompliant."

Davis (1966) carried out a study in a university medical school in which only one-half of fourth year medical students and one-fifth of medical faculty felt the physician should try to identify the cause of noncompliance. Eight percent of the students and thirty-four percent of the faculty said the physician should withdraw from the case, thus viewing compliance as a patient problem rather than a responsibility of the physician. Perhaps the most disconcerting example of physicians' attitudes toward noncompliance was expressed in the article "Why Patients Don't Follow Orders" (1972). It cited an American Academy of Family Physicians' questionnaire which asked what was the single most annoying thing patients do other than not paying bills. Thirty-three percent of those who responded cited noncompliance. This article concluded by suggesting that separating the "incorrigibly disobedient" from the

"well-motivated responsive patient" could be a major step in reducing high noncompliance rates.

Kasl (1975) reviewed the literature related to the doctor-patient relationship and concluded (p. 11):

.... it would seem that the crucial element in the doctor-patient relationship is probably not the exchange of information and facts; but the nature of the expectations each one has about his own role and the role of the other person in the dyad, the congruence and mutuality of such expectations, and the potential for exploring and revising these expectations.

Christensen (1978) reviewed the literature and suggested that the Health Belief Model was not totally adequate to explain drug-taking compliance behavior. He suggested that the model does not adequately address the dynamics of the physician-patient relationship nor the processes through which patients' perceptions and subsequent behaviors are formulated. Christensen proposed a modification of the Health Belief Model that views drug-taking compliance as a response by the patient to a sequence of testing and illness-redefinition stages during the course of an illness. The model adopts the perspective of the patient who reassesses the decision to comply with prescribed instructions throughout the illness. The initial encounter between physician and patient is seen as a testing and learning one. The physician provides an assessment of the patient's disease and its seriousness and offers a treatment plan with indications of its benefits, actions required, cost to the patient in terms of expense, time and effort involved, and any discomfort. In light of the new information provided, the patient reassesses his health and need for action (judgment of compliance). Christensen (1978, p. 183) concludes:

Initial compliance behavior stems directly from the patients reassessment of the seriousness of his condition and the benefits and costs of alternative actions. The patient is most likely to follow the prescribed treatment regimen when there is general congruence with his previous perceptions and expectations. When incongruence or disagreement is resolved and redefined in accord with the physician's view, the patient will tend to comply, but on a much more tentative basis; when redefinition is away from the physician's perception, the patient will not comply.

Thus, Christensen has suggested that initial compliance behavior is directly related to congruence between physician and patient perceptions and expectations. This is the primary focus of this study and it is hoped that the data from this study will be useful in identifying and making overt the differences between physicians' and patients' judgments and therefore facilitate the likelihood of physician-patient concordance.

Summary. A review of the literature related to characteristics of the provider and patient-provider interaction associated with compliance revealed a few specific and several general findings. The degree of supervision is positively associated with compliance, and the patients' stated level of expectations and conclusions that the expectations have been met are positively correlated with compliance. The negative perception by physicians of noncompliant patients was noted in two studies. In a university medical school, only one-half of fourth year medical students and one-fifth of medical faculty felt the physician should try to identify the cause of noncompliance, thus viewing it as a patient problem rather than a responsibility of the physician. Further, a questionnaire of family physicians found noncompliance listed as the single most annoying thing patients do other than not paying bills.

It was suggested in the literature that physicians and patients hold differing views and perceptions of the patient's problems and most

desirable therapeutic regimen, and emphasis should be placed on making these differences overt and explicit. It was proposed that initial compliance behavior is directly related to congruence between a physician's and patient's perceptions and expectations. This is the primary focus of this study and it is hoped that the data from this study will be useful in identifying and making overt the differences between physicians' and patients' judgments and therefore facilitate the likelihood of physician-patient concordance.

Specific Determinants Selected for this Study

In order to use the lens model, specific cues thought to account for the greatest amount of variation in the judgment must be identified. Several factors were considered as guidelines when identifying the cues. The number of cues selected was limited by taking into consideration the complexity of the design and the previous research findings. Each cue (convenience, cost, severity of illness and support) was descriptively and distinctly defined in a range of three levels (low, moderate, and high) in the instrument. The decision to use three levels was based on the finding that more than three levels added significant complexity to the design, and less than three levels did not appear to allow realistic variation in the cues. With four cues and three levels of each, 81 cases would be required for a complete design. The time required for a subject to make judgments on 81 cases would prohibit successful recruitment of subjects. Therefore, a fractional factorial design with 27 unique cases was used to make the time involved in completing the instrument such that subjects could reasonably be expected to participate. Further, studies have typically shown that persons making judgments use less than five cues in making their judgments (Elstein and Bordage, 1979). It is also important

to note that this study, consistent with use of the lens model, does not directly address affective, emotional and personality variables as they impact on the judgment, but looks at cues that can be perceived by physicians and patients. Finally, broad categories of cues were defined for this study to build on the specific findings from the research while describing the cues in a way that would most likely be meaningful to subjects.

As mentioned previously, choice of the four cues was based on a review of literature as well as a preliminary survey of health care professionals and patients, and a pilot study of an instrument using the four factors identified. The latter two procedures are discussed in Chapter III. The four determinants of compliance chosen for this study are convenience, cost, severity of illness, and support. The literature related to each of these is summarized from the previous review of literature.

Convenience. Convenience is defined for this study as the amount and difficulty of change in usual daily activities or lifestyle that is required for the patient to carry out the doctor's orders. The amount of lifestyle change required by the medical regimen was consistently identified in the literature as an important determinant of compliance (Davis, 1967; Hulka et al., 1975, 1976; Gillum & Brasky, 1974; Haynes, 1976a, 1979). Gillum and Brasky (1974) noted that an individual is most likely to carry out aspects of the medical regimen that are least difficult and disruptive of preexisting behavior. Individuals may adopt only a portion of a therapeutic regimen, choosing that which is least difficult for them. Haynes (1976a) noted that compliance by patients who must acquire new habits is much greater than compliance exhibited by patients who must

alter old behaviors. Further, individuals who must change personal habits are the least likely to adhere to a prescribed regimen. Thus, a review of the literature does support an association between convenience (as defined for this study) and compliance.

Cost. Haynes' (1976a) reviews of studies suggested that there was very little information on the effect of the cost of therapy on compliance. Two reports suggested a negative effect and the single study that found no relationship was based in a clinic where the cost of treatment was determined by the ability to pay. A study of military medicine found cost not to be a major concern to beneficiaries seeking care outside the military system. Haynes (1976a, 1979) identified as a priority for research full examination of the role of cost of therapy in compliance, including indirect cost (lost time from work, travel, etc.) as well as direct costs. Cost is defined for this study as the total financial cost of carrying out the doctor's orders. This cost would include repeated office visits to see the doctor, loss of time from work, medications, transportation, babysitter, special foods and equipment related to what the doctor ordered. Therefore, use of cost for this study responds directly to Hayne's suggestion.

Severity of Illness. This cue is defined in this study using hypertension as the disease entity. The definition describes how much higher than normal the patient's blood pressure is, (descriptively defined such as "quite a bit higher"), how long the blood pressure has been high, how the patient is feeling, and how much chance they have for problems such as stroke. The literature does not support severity of illness as perceived by the health professional as being related to compliance. However, as Marston (1970) has pointed out, severity as perceived by the

patient is thought to result in increased compliance. This is defined as one aspect of the Health Belief Model (Kirscht and Rosenstock, 1977; Rosenstock, 1975) which supports the fact that patients' perceptions of the seriousness of their illness and the efficacy of the treatments they receive (independent of the truth of these matters) is related to compliance with therapeutic regimens prescribed for their illness. Haynes (1976a) supported these findings along with Weisenberg (1977). Becker (1979) and Christensen (1978) recognized some mixed findings in recent studies of the relationship between perceived severity and compliance, and suggested that this association may not be consistent for all types of health actions or all levels of severity. However, overall review of the literature suggests this cue as a factor associated with compliance.

Support. Support is defined for this study as the amount and type of helpfulness and encouragement the patient receives from those people who are important to the patient, such as people the patient works with and lives with. The literature is not conclusive on the role of support in compliance. Vincent (1971) reported that the importance of the influence of family members in encouraging or discouraging compliance was suggested in his data. This finding was supported by Bille (1977). However, Kasl (1975) cited conflicting results and suggested that if there was an association, it was in ways which represent interaction with other variables (see previous review of the literature). Charney (1972) reviewed the literature and found that family factors did correlate well with whether a patient would seek medical care, but the influence was blurred once care was studied. A review of 19 studies found dropping out of treatment was associated

with low social support in all 19 studies (Baekland and Lundwall, 1975). Weisenberg's (1977) review of literature noted that patients with stable and cohesive family backgrounds and patients who have help available in the community were more likely to comply with prescribed regimens. Finally, Haynes (1976a) noted that compliance was higher among patients with "supportive" intact families and lower among those from unstable families, and Becker (1979) suggested that the effect of family and other support systems on the patient's adherence to a regimen is likely to be of tremendous importance, and should be a focus of future research. Thus, the literature, while not conclusive, suggests that support of family and friends is associated with compliance.

Summary. Convenience, cost, severity of illness and support were selected as the determinants of compliance to be used in this study. Their selection was based on a review of the literature, as well as interviews with at least 10 patients and 10 health care professionals. The relation between cost and compliance was not strongly supported in the literature, but was identified as a priority for research. Support and convenience were strongly cited in the literature as being correlated with compliance. Severity of illness was frequently found to be correlated with compliance when defined as the patient's perceived severity, independent of the truth of the matter. Thus, the literature supported the use of these four cues in the study of judgments related to compliance.

Judgment Theory-Lens Model

Explicit definitions of the term judgment are difficult to find in the literature, since the term is used as a label for a phenomenon. Judgment may be narrowly defined as the assignment of an object to a small

number of categories (Johnson, 1972) such as judging a defendant guilty or not guilty. Judgment has the effect of settling an uncertain state of affairs. Newell (1968, p. 5) has provided a useful definition of the parameter of judgment by noting that judgment is a cognitive process with the following characteristics:

1. The main inputs to the process, that which is to be judged, are given and available; obtaining, discovering, or formulating them is not part of judgment.
2. The domain of the output-the set of admissible responses is simple and well defined prior to the judgment. The response itself is variously called a selection, estimation, assertion, evaluation, or classification (in the sense of identification of class membership, not of creating the classes), depending on the nature of the domain.
3. The process is not a simple transduction of information; judgment adds information to the output.
4. The process is not simply a calculation, or the application of a given rule.
5. The process concludes, or occurs at the conclusion of, a more extended process (the causal role is not completely clear).
6. The process is rather immediate, not being extended in time with phases, stages, sub-processes, etc. (If such occur, they tend to be referred to as preparation for judgment).
7. The process is to be distinguished from searching, discovering, or creating, on the one hand; and from musing, browsing, or idly observing, on the other.

Judgments are an important part of our daily life. The possession of good judgment is thought to be a mark of wisdom, while poor judgment denotes failure and perhaps lack of mental competence. Early studies of judgment in laboratory settings have provided little information in the complex everyday aspects of judgments such as choice of occupation, social

policy or political preference. Since World War II, studies of these more complex human judgments have begun in earnest.

Hammond has studied judgments in a social context (Hammond and Joyce, 1975). He proposes that in social life, conclusions are drawn with regard to cognitive tasks or mental processes that cannot be completely analyzed. For example, most people do not have an analytical process or formula to use in judging whom to trust or how to best use one's money. These tasks are dealt with in terms of human judgment. Hammond (1975) notes that both intuition and analysis are the usual mode of thought persons apply to the cognitive tasks of everyday life. The extent to which each of these is used is an individual matter. Some use intuition to supplement analysis, others use analysis as a check on intuition. However, Hammond stresses that the basic cognitive process upon which judgment rests rather involves elements of both analysis and intuition. One reason both elements are necessary is because the cognitive tasks of everyday life involve an element of uncertainty. Analysis cannot be thoroughly applied because all of the facts involved in the tasks are usually not known.

Hammond's theory is an adaptation of the lens model, founded on the work of Egon Brunswik and Edward Tolman. The principal concept of Hammond's judgment theory is that judgment is a cognitive process similar to inductive inference in which a person draws a conclusion or an inference about something which he cannot see or directly perceive, on the basis of factors which he can see or directly perceive. Thus, judgments are made from observable data which serve as cues to non observable events and circumstances. For example, a doctor looks at the symptoms a patient presents, such as degree of fever, presence or absence of sore throat, and cough, to make a clinical judgment as to the presence or absence of a

specific disease process in the patient's body. Further, Hammond (1975) noted that some factors or cues in a situation may be given more weight or importance in making inferences about events. That is, a person may use one factor more than another in making a judgment. For example, the doctor may put more value on the presence or absence of a fever, than on the presence or absence of cough in diagnosing a patient.

Hammond (1973) used his theories not only to look at everyday inferential judgments, but also to examine what he called "cognitive conflict." Hammond observed that conflicts occurring in the Western world prior to nuclear capability were generally motivated by material gains. However, nuclear weapons, population explosion, and other crucial factors created an awareness that the major problems on earth are common to all men. Therefore, the question has been changed from "who gets what" to "whose solution to the problem is best?" Hammond (1973, p. 189) calls conflict between ideologies "cognitive" since it "derives from differences over what men believe to be the efficient, just, and moral ways to solve their problems." The lens model has been adapted to study this type of cognitive conflict, by focusing on the interaction of two subjects coping with a judgment task. This adaptation of the lens model allows for the study of interpersonal conflict in which two or more persons make different judgments in the same situation. The disagreement in the judgments may be found to be a factor of how each person is using the information in the situation, that is, the weight or importance each is placing on the perceived cues when making the judgment. Hammond's work is unique in suggesting that the properties of judgment processes may themselves produce conflict (Kaplan and Schwartz, 1975), a finding supported in studies carried out by Brehmer (Hammond and Brehmer, 1973).

Cognitive feedback was defined in Chapter 1 as a form of feedback which enables the person to compare the properties of his or her cognitive system (that is, how the individual is using the cues in a judgment) with the properties of the task system with which the individual is trying to cope. Hammond, Rohrbauch, Mumpower and Adelman (1977) noted that cognitive feedback can be contrasted with outcome feedback in which the individual has access to information about outcomes but not about relationships in the judgment process. Outcome feedback tells individuals whether their judgments leads to success or failure, but nothing about the reason for this occurrence. Hammond et al. (1977) note that it is cognitive feedback that individuals try to provide for one another to help one another improve judgments. For example, as a medical student is learning the art of diagnosis, the student will not only be told whether the diagnosis is right or wrong, but which symptom or combination of symptoms is most indicative of the diagnosis.

Hammond and Summers (1972) discuss the use of feedback with Brunswik's lens model when two or more individuals who have learned to use probabilistic cues in different ways must reach joint agreement in a task. They note that studies have shown reduction of conflict occurs slowly, if at all, with outcome feedback and found that although the subjects' knowledge increased, their cognitive control diminished. Thus, although the subjects came closer to agreement in principle, loss of cognitive control produced continued differences in judgment. The subjects knew what to do but did not apply their knowledge effectively. Hammond and Summers (1972) cite other studies (Summers and Hammond, 1976; Goldberg, 1968) indicating that in a complex inference task, outcome feedback is practically useless, and in fact, might be detrimental to cognitive control. It was suggested that feedback consist of cognitive material to help subjects not only see that their judgment was in error or different, but why.

Information gained from this study using the lens model may be useful in giving direction in future studies to the use of cognitive feedback to promote physician-patient concordance. The literature shows that physicians and patients are not looking at the likelihood of the patient carrying out the prescribed regimen in a similar manner. Kleinman (1978) notes that patient-doctor interactions are transactions often involving major discrepancies in cognitive content as well as therapeutic values, expectations and goals. Using cognitive feedback, a person would be given feedback about their own use of cues in making the judgment. Thus, the physician and patient could discover the cognitive bases of differences in their points of view.

This study is an attempt at what Hoffman (1960) has called a paramorphic representation of human judgment, meaning a mathematical representation of the judgment process. This representation is interpreted as performing like the judge, not as describing actual information-processing strategies. Shanteau and Phelps (1977) caution that this distinction is frequently overlooked and the assumption made that a judge's thinking process is described in a mathematical model. They note that a linear model is a power predictive tool but prediction does not equal process. The paramorphic representation does, however help explain what is observed concerning certain characteristics of a judge and is useful in making predictions. This type of description is of necessity incomplete as there are other properties of judgment still undescribed, and it is not known how completely the underlying judgment process has been represented. This study does not attempt to use information-processing models. Information-processing models would analyze the steps and thoughts of physicians and patients as the judgment is made and ask the question "What are the processes and states a particular subject uses to solve a

particular problem?" (Elstein and Bordage, 1979). The question this study asks within the judgment paradigm is: How do physicians and patients use information given to them to make the judgment as to the likelihood of the patient carrying out the medical regimen?

The instruments used in this study also obtain physicians' and patients' subjective descriptions of their judgment policy, which can be compared with the objective descriptions provided by a regression model. Understanding any differences in the two policies will contribute to knowledge about judgment and may be useful in understanding and comparing differences in judgments of physicians and patients regarding compliance. The subjective descriptions are the patients' and physicians' self-reports of the importance they attach to the cues in making the judgment. The objective descriptions are the mathematical weights derived from multiple regression techniques attached to the cues. It can be determined if there is a relationship between how physicians and patients subjectively report that they weight information, and an objective measure of how they weight information. Furthermore, this study compares subjective and objective policies by generating predicted judgments through the use of subjective and objective weights. Physicians and patients may differ in their subjective and objective weights, but the predicted judgments generated from these weights may be highly related. This would allow not only examination of the weights, but the outcome or judgment made using those weights.

Summers et al. (1977) studied subjective vs. objective descriptions of judgment tasks, and found that when a subject's subjective weights were used to reproduce his judgments, the variance accounted for 20% less than that accounted for by the objective regression model. Summers et al. (1970, p. 250) stated that:

....these results point to some of the problems that are likely to arise when two or more individuals attempt to communicate their judgment policies to each other. As shown here, neither S's quantitative estimates of his cue weighting nor his verbal description is likely to convey an accurate account of his policy. The consequences of this failure of self-report could well include misunderstanding, mistrust, and even conflict.

Many studies using the lens model have attempted to identify sub-groups or clusters of subjects making similar judgments or using cues in a judgment in a similar fashion (Bottenberg and Christal, 1968; Christal, 1968; Maguire and Glass, 1968; Naylor and Wherry, 1965; Wherry and Naylor, 1966; Wiggins, 1973; and Zedeck and Kafry, 1977). Examining the relation between individual differences and judgment policy has been approached in a variety of ways using a variety of algorithms. In many studies, cluster analysis or other statistical analysis has been used to classify members of a group into subgroups that are similar with respect to their judgments. The instrument used in this study will collect data which can be used for analysis of the relationship between judgments, cue utilization, and demographic data of the subjects. This will provide information useful in determining if identification of sub-groups of physicians and patients making similar judgments or using cues in a similar fashion is feasible.

Hammond and others (Hammond, 1978; Hammond and Joyce, 1975; Hammond et al, 1977) have applied their adaptation of the lens model in a variety of settings involving public policy, labor-management negotiations, and the study of psychoactive drugs and social judgment. Hammond and Adelman (1976) used the lens model to integrate scientific judgment and social judgment in a dispute about hand gun ammunition for a police department. They argue that scientifically, socially, and ethically defensible means can be found for integrating science and human values.

In the health area, the lens model has been used to study the physician's reliance on signs when making a diagnostic judgment (Slovic, Rorer, and Hoffman, 1971), use of information to determine treatment for an overactive thyroid (Moore, Aitchison, Parker, and Taylor, 1974), and pathologists judgments of biopsy slides (Einhorn, 1974). Zedick and Kafry (1977) also studied the judgments of nurses in evaluating peers. The lens model has shown to be a practical, flexible paradigm with which to study judgments in every day situations involving an inference. It holds promise as a basis for study of the patients' and physicians' judgments regarding the likelihood of the patient carrying out the prescribed medical regimen.

Summary. Judgments are a phenomenon that are an important part of our daily life. Study of more complex human judgment has only begun in earnest since World War II. Hammond has asserted that most people do not have an analytical process or formula to use in making judgments such as whom to trust, but rely on intuition as well as analysis. One reason both intuition and analysis are necessary is because the judgments of everyday life involve an element of uncertainty.

Hammond's theory is an adaptation of Brunswik's lens model. The principle concept of this theory is that judgment is a cognitive process similar to inductive inference in which a person draws a conclusion or inference about something which he cannot directly perceive on the basis of cues which he can perceive. Further, Hammond noted that some factors or cues in a situation may be given more weight or importance in making inferences about events. If two persons in the same situation use the cues in the situation differently, and infer different judgments, conflict may arise. The lens model has been adapted to study this type

of cognitive conflict by focusing on the interaction of two subjects, such as labor and management representatives, coping with a judgment task such as a contract negotiation. The disagreement in the judgments may be found to be a factor of how each person is using the information in the situation, that is, the weight or importance each is placing on the perceived cues when making the judgment.

The purpose of this study is to compare the judgments of physicians and patients regarding the likelihood that a patient will carry out a prescribed medical regimen. This is an inferred judgment and thus lends itself to study using Hammond's adaptation of the lens model. With this paradigm, judgments of physicians and patients can be compared, and the importance physicians and patients place on the cues in the situation can be compared.

Use of cognitive feedback to identify the cognitive differences that may be producing conflict is discussed in the judgment literature. Hammond and Summers (1972) noted that in complex inference tasks, outcome feedback was practically useless, and suggested feedback consist of cognitive material to help subjects see that their judgments were different and why. Information gained from this study may be useful in giving direction to the use of cognitive feedback in future studies to increase health promoting behaviors.

The instrument used in this study also obtains physicians' and patients' self-reported subjective descriptions of their judgment policy, which can be compared with the objective description provided by statistical analysis. Understanding any differences in the two policies will contribute to knowledge about judgment and may be useful in understanding and comparing differences in judgments of physicians and patients regarding compliance.

Thus, the judgment paradigm provides a useful tool to study the judgments of physicians and patients regarding the likelihood that a patient will carry out a prescribed medical regimen. The extent of differences between physicians and patients and the way in which each group weights the cues in the situation are major issues addressed in this study.

CHAPTER III

PROCEDURES

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Introduction

This study used two groups of subjects, physicians and patients, to compare their judgments of patient adherence to a prescribed medical regimen. The instruments consisted of a series of cases, each case describing a level of each of the cues- convenience, cost, severity of illness and support. Three levels of each of the four cues were identified. With four cues and three levels of each, a full design would have included 81 cases. However, to make the instrument feasible for subjects to complete, 27 unique cases were used. Thus, the design for the study was a 1/3 replication of a 3^4 fractional factorial. Data were collected from 30 physicians and 30 patients, and analyzed using Statistical Package for the Social Sciences (SPSS) multiple regression and Finn Multivariate procedures, as well as SPSS procedures for Pearson and Spearman correlations, and chi square measure of association.

The procedures followed in this study are discussed within the framework of subjects, research design, instrumentation, data collection, research questions, analysis of data and pilot study.

Subjects

Physicians. Physicians for this study were recruited from the Clinical Center, an ambulatory care center located at Michigan State University, East Lansing, Michigan. This facility provides complete

outpatient health care services for the general public, Michigan State University faculty and staff. The Clinical Center serves approximately 54,500 patients per year. The Center is the nation's first university health care facility staffed jointly by allopathic (M.D.) and osteopathic (D.O.) physicians.

The four departments within the Clinical Center used for this study were Family Medicine, Family Practice, Internal Medicine and Osteopathic Medicine. The departments of Family Medicine and Osteopathic Medicine are staffed by osteopathic physicians, and the departments of Family Practice and Internal Medicine are staffed by allopathic physicians. All physicians staffing the departments hold faculty appointments with either the College of Osteopathic Medicine or College of Human Medicine. The departments of Family Medicine and Family Practice serve family units, which may include children as well as adults. The Departments of Osteopathic Medicine and Internal Medicine provide services in a variety of medical specialities, such as cardiology, nephrology, oncology and gastroenterology.

Criteria for admission of physician subjects to this study were that the physician care for adults in an ambulatory care setting and carry a case load that included hypertensive patients. All physician subjects used in this study met these criteria and were recruited from the staff of these four departments of the Clinical Center. Surgeons were not sought as subjects because the background for this study is hypertension, a chronic disease requiring life-long treatment. Surgical intervention usually entails a short term of care and thus does not involve judgments about a prolonged treatment program.

Prior to recruitment, approval to carry out this study was obtained from the University Committee on Research Involving Human Subjects. The first page of the two instruments used in this study was judged by the

committee as adequate explanation for subjects and no consent form was required.

To obtain physician subjects, the researcher attempted a variety of approaches prior to initiating recruitment at the Clinical Center. This process was begun in July, 1979. Recognizing that community based physicians would provide a more generalizable population, chairmen of the Departments of Family Practice and Internal Medicine at a local hospital were approached regarding the research. This strategy was not productive and yielded no evidence of support for the research. Local health agencies such as Michigan Health Council and Michigan Medical Society were contacted for suggestions. Contacts were also made with persons involved in several hypertensive studies being carried out within the state. The research was presented to and supported by the Ingham County Medical Society. While support was gained, none of these approaches directly produced physician subjects.

In approaching the Clinical Center as a site for the research, support was obtained from medical school administration, Clinical Center administration, and each of the four department chairmen. Protocol for requesting participation of the faculty members varied by departments and the researcher followed the suggestion of each department chairman. The four different approaches used were:

1. An oral presentation by the researcher to the faculty of one department.
2. Individual letters outlining the study sent from the researcher to the faculty members designated by one department chairman, and accompanied by a cover letter from the chairman supporting the study.

3. A letter and information regarding the research sent from one department chairman to the faculty members of that department.

4. Identification of appropriate faculty members by one chairman and direct contact with faculty made by researcher.

Physicians contacted by these procedures received a form (see Appendix A) which was returned to the researcher to indicate interest or request more information. All physicians requesting more information were contacted by phone or in person.

By following the protocol of each department chairman, 11 physicians returned forms and volunteered to participate in the study. Eight other physicians returned forms requesting more information. The 8 physicians who requested further information were contacted by the researcher in person, by phone or both, and all 8 then agreed to participate. However, of the 19 physicians thus recruited, 3 reversed their decision and did not serve as subjects. One physician declined after deciding he did not carry a sufficient patient load; one declined and expressed dissatisfaction with data collected based on hypothetical situations; and one returned the instrument and indicated a misunderstanding within his department had caused him to reconsider and decide not to do the study. Another physician completed the form with responses not suitable for analysis. Thus, the total yield from this process was 15 physicians.

Seventeen other physicians from these four departments were personally contacted by the researcher on the referral of nurses, staff, faculty and physicians. Of the 17, 16 consented and participated. However, one of these physicians returned the instrument incomplete so a

total of 15 physicians were obtained by this process. Thus, the total number of physician subjects contributing data for analysis was 30.

Of the 30 physicians participating in this study, 16 were allopathic physicians (M.D.) and 14 were osteopathic physicians (D.O.). The characteristics of the physician subjects are identified in Table 3.1. Other demographic characteristics will be discussed in Chapter 4.

Table 3.1
Characteristics of Physician Subjects

Degree	N	Age*	Sex	Number of Years of Experience
M.D.	16	$\bar{X}$ 42.8	M 15 F 1	$\bar{X}$ 14.9
D.O.	14	$\bar{X}$ 36.1	M 10 F 4	$\bar{X}$ 5.6
Total		$\bar{X}$ 30	M 25 F 5	$\bar{X}$ 10.5
		S.D. 10.1 Range 27-61		S.D. 9.5 Range 1-30
*Data on age were obtained for 28 physician subjects.				

The subjects represent a high percentage of the physicians staffing these four departments of the Clinical Center. Specifically, data were collected from 8 of 9 physicians in the Department of Family Practice and 12 of 16 from the Department of Family Medicine. Many of the physicians in the Departments of Internal Medicine and Osteopathic Medicine did not meet the criteria since as specialists, not all physicians saw hypertensive patients. From the Department of Internal Medicine, 12 physicians were identified as potential subjects by the chairman and of

these, 6 participated in the study. Two other physicians from the department participated after personal contact from the researcher. Three physicians from the 7 staffing the Department of Osteopathic Medicine met the criteria and were contacted, and 2 of the 3 participated in the study.

It is difficult to say, for the purposes of generalizability, what differentiates physicians who volunteered for the study from those who did not. There appeared to be a wide range of attitudes among physicians toward research in general and behavioral research in particular. The physicians were not financially reimbursed for their participation and the motivation of those who participated and those who did not is not known.

Patient Subjects. Patients for the study were recruited from those seeking care from the departments of Family Medicine, Family Practice, Internal Medicine and Osteopathic Medicine at the Clinical Center. The criteria for admission of patient subjects to this study were that they be adults and never diagnosed as having hypertension. Because hypertension is the disease entity presented in the study, hypertensive patients were excluded to avoid the possibility of patients identifying with their own level of illness rather than the level of severity of hypertension presented in each case. No attempt was made to directly match each physician and patient but patients were recruited from the pool of patients seen by the physician participants. The number of patient subjects recruited from each department was equal to the number of physician subjects participating in the study from that department. Data from patient subjects were collected concurrent with data from physician subjects, that is, from January, 1980 through April, 1980.

The protocol for obtaining patient subjects followed the guidelines of the University Committee on Research Involving Human Subjects (UCRIHS) and the administration of the Clinical Center. The primary constraint identified by UCRIHS was that the patients be initially contacted by staff of the Clinical Center who already knew the person as a patient. In association with the nursing administration of the Clinical Center, a form was developed to be used in recruiting patient subjects (see Appendix B). The researcher also met with the nursing staff to enlist their support. The nurses took the initiative in encouraging patients to participate and the forms were placed in the waiting rooms for patients to read if interested. In one unit letters were written to participating physicians to encourage physicians to recruit patient subjects and a display was set up in the physicians' conference room. Rounds were frequently made by the researcher to the four patient care areas to elicit support from the staff and obtain names of patient volunteers.

Of the 30 patient subjects, 23 were female and 7 male. The age range was 21-83 with a mean of 38.6 and standard deviation of 16.5. Data regarding income, level of education and employment status can be seen in Table 3.2.

Table 3.2
Characteristics of Patient Subjects

Income Level	N	%	Education	N	%	Employment	N	%
Under \$ 5,000	2	6.7%						
\$ 5,000-9,999	4	13.3%	High School Grad.	3	10%	Employed	19	63.3%
\$10,000-14,999	5	16.7%	At least 1 yr. College	7	23.3%	Homemaker	4	13.3%
\$15,000-19,999	5	16.7%	B.A.orB.S.	12	40%	Temporarily unemployed	3	10%
\$20,000-24,999	2	6.7%	Graduate Degree	8	26.7%	Retired	4	13.3%
\$25,000 or more	12	40%						
Total	30	100%		30	100%		30	100%

Of the patient subjects recruited, 4 of the 34 did not complete the instrument. One subject was very uncomfortable with the process and did not wish to continue, and another subject had been diagnosed as having hypertension and thus did not meet the criteria. One subject returned the form incomplete and another stated he sent the form but it was not received.

As with physician subjects, it is difficult to identify what differentiates patients who volunteered for the study from those who did not. Patients were not financially reimbursed and the motivation of those who participated and those who did not is not known.

Research Design

This research was a comparative study using two groups of subjects, physicians and patients. The instrument developed for the study was based on the lens model and four cues were identified for the study with three levels of each cue described. The dependent variable was a judgment of the likelihood of carrying out the prescribed regimen made on a 5-point scale for each case. A full 3^4 design would have involved 81 cases which would not have been feasible for subjects to complete in a reasonable period of time. Therefore, a fractional factorial design was used with 1/3 replication of a 3^4 design using 27 unique cases (See Figure 3.1).

		Cost Low			Cost Med.			Cost High		
		Supp. L	Supp. M	Supp. H	Supp. L	Supp. M	Supp. H	Supp. L	Supp. M	Supp. H
Convenience Low	Sev. Low	x_1^*					x_6		x_8	
	Sev. Med.		x_{20}		x_{22}					x_{27}
	Sev. High			x_{12}		x_{14}		x_{16}		
Convenience Med.	Sev. Low		x_{11}		x_{13}					x_{18}
	Sev. Med.			x_3		x_5		x_7		
	Sev. High	x_{19}					x_{24}		x_{26}	
Convenience High	Sev. Low			x_{21}		x_{23}		x_{25}		
	Sev. Med.	x_{10}					x_{15}		x_{17}	
	High		x_2		x_4					x_9

	ABCD***		ABCD		ABCD
Case 1**	0000	Case 10	0021	Case 19	0012
Case 2	0122	Case 11	0110	Case 20	0101
Case 3	0211	Case 12	0202	Case 21	0220
Case 4	1022	Case 13	1010	Case 22	1001
Case 5	1111	Case 14	1102	Case 23	1120
Case 6	1200	Case 15	1221	Case 24	1212
Case 7	2011	Case 16	2002	Case 25	2020
Case 8	2100	Case 17	2121	Case 26	2112
Case 9	2222	Case 18	2210	Case 27	2201

* x_1 = Case 1

**Taken from Cochran and Cox, 1957, p.290.

***Column A=Cost; Column B=Support, Column C=Convenience; Column D=Severity of Illness.

Figure 3.1

1/3 3^4 Fractional Factorial Design

Use of experiments in fractional replication was proposed by Finney in 1945 to enable 5 or more factors to be included simultaneously in an experiment of a practical size (Cochran and Cox, 1957). However, this advantage is not without its hazards. The results of an experiment with fractional replication may be misinterpreted if some of the interactions that have been assumed negligible are not so. Application of fractional replication in this study will be discussed in greater detail in the analyses section and in Chapter 4.

The design for this study was a repeated measures design with two groups of 30 subjects each making judgments on 27 cases as shown in Figure 3.2.

	Cases																										
	1	2	3	4	5	6.....27																					
Patients	1																										
	2																										
	3																										
	.																										
	.																										
	30																										
Physicians	31																										
	32																										
	33																										
	.																										
	.																										
	60																										

Figure 3.2
Repeated Measures Design

Thirty physicians and thirty patients were used for this study, a number considered adequate to answer the questions in this research. With $\alpha = .05$, 30 subjects in each group enabled a difference of $3/4$ standard deviation to be detected with .80 power or a difference of 1 standard deviation to be detected with .90 power (Cohen, 1977). Thus, in comparing physician and patient groups, a difference of $3/4$ standard deviation could be detected with 80% confidence that that was the true situation (Hays, 1973).

Detection of small differences between physicians' and patients' judgments and how they use the four cues in making those judgments was not seen to be of practical significance. If the judgments of physicians and patients showed a large difference, as $3/4$ -1 standard deviation would indicate, this information would be useful in assessing, planning and implementing health education strategies as a part of health care. If the differences were less than $3/4$ -1 standard deviation, it would not be worth the investment of time and resources to attempt to bring the judgments of physicians and patients into closer approximation, because it would not appear to be a major factor affecting compliance.

Instrumentation

The instruments used in this study were previously developed and field tested by the researcher. Similar forms of an instrument based on Hammond's adaptation of Brunswik's lens model were used to examine and compare the judgments of physicians and patients regarding the likelihood of a patient's carrying out a prescribed medical regimen. The instrumentation will be discussed in relation to format, reliability and validity.

Format. The dependent variables, judgments of the likelihood of carrying out the prescribed medical regimen, were measured by similar

versions of an instrument developed for physicians and patients (See Appendix C & D). The patients' instrument consisted of a brief explanation of the study, followed by questions asking for demographic data. Information about use and satisfaction with medical care and the degree to which prescribed medical regimens had been carried out was also obtained. Since the instrument asked patients to imagine that the doctor had told them they had hypertension, and they were told to base their judgments upon that supposition, information about hypertension was provided as part of the instrument. This information was written in lay terms and included the definition of hypertension, distribution in the population, cause, how it feels, and common treatment program.

Definitions and descriptions of the four cues used in the study followed the explanation of hypertension. The four cues were convenience, cost, severity of hypertension, and support. A general definition and brief description of 3 levels of each cue was provided. Each cue was descriptively and distinctly defined in a range of three levels (low, medium, and high) in the instrument. However, the levels were not labelled to avoid the possibility of subjects responding to the label as well as the description (Einhorn, 1974). The decision to use three levels was based on the finding that more than three levels added significant complexity to the design, and less than three levels did not appear to allow realistic variation in the cues.

On the response sheet, the treatment program applicable to all cases was presented. A 5-point scale was identified to be used in making the judgments. Patients were asked to judge for each case presented how likely they would be to carry out the treatment plan for an indefinite period of time. Each subject judged 34 cases, consisting of 2 practice

cases, 27 unique cases, and 5 replications used for test-retest reliability. As a final task, subjects were asked to spread 100 points between the four variables according to how important each one was in making their judgments. Subjects were also asked to identify any other kinds of information that they used in making the judgments. Finally, the patients were asked how they thought doctors used the four variables in making judgments of the likelihood of the patient carrying out the prescribed regimen.

Except for a differential level of terminology, the instrument for physicians was the same as that for patients. However, the demographic data did not include income and occupation, but asked for data regarding medical background and usual policy toward patients not following the prescribed regimen. The information about hypertension was included as a part of the physicians' instrument to indicate to physicians what information the patients received.

Thirty-four cases with levels of cues identical to the patients' instrument were presented to the physicians. Based on a 5-point scale, the question asked of physicians was "In this situation, how likely would the patient be to carry out the treatment plan for an indefinite period of time?" A case consisted of a brief description of each of the four cues with one of the three possible levels of that cue represented by each description. Therefore, each case consisted of four brief descriptions of cues followed by the question "How likely would you be (or if subject is the physician, "How likely would the patient be) to carry out the medical regimen in this situation?" The medical regimen was constant across all cases and defined as a restricted diet, a medication, and a schedule for followup medical care. A random order of cases was used and the cues for each case were described in alphabetical order.

Validity and Reliability. Nunnally (1978) notes that after an instrument has been constructed, it is important to examine whether the instrument is useful scientifically. This is frequently referred to as determining the validity of an instrument, that is, whether the instrument does what it is intended to do. Sometimes performance of an instrument is easily verified, and other times it is more difficult. Ebel (1978) notes that to demonstrate validity, test scores must be compared with some other independent measures of what a test ought to measure. Frequently, such measures are not available, especially for trait-defining tests. Ebel suggests that the quality of a trait-defining test is dependent more on the clarity and completeness of the trait definition than on its presumed validity. Thus, Ebel proposes that instead of working in vain to demonstrate that a test is valid, it is more important to show that what the test is designed to measure has been clearly and specifically defined in operational terms, which this study has attempted to do.

The instruments developed for this study cannot be compared with other known instruments to provide equivalent measures. The independent measures necessary for this task are not known to exist. Rather, throughout this study, the researcher attempted to define explicitly what the instrument is designed to measure, and the basis upon which it was designed. To address content validity, a panel of five experts knowledgeable in judgment research using the lens model were asked to rate how well the instruments could provide data to answer the research questions posed in this study (See Appendix E). In response to a question asking how well the instruments measured the judgments of physicians and patients, four indicated "very well" and one indicated "adequately." In response to a question asking how well these instruments measured the

weights the patients and physicians assigned to the four cues, one indicated "exceptionally well," two responded "very well," and two marked "adequately."

It is assumed that these measures along with definitive description of the design and use of the instrument provided the most rational and useful approach to addressing the validity of this instrument.

Magnusson (1966, p.60) states that "...reliability is the accuracy of the measurement, irrespective of whether one is really measuring what one intended to measure." Nunnally (1978) notes that high reliability does not necessarily mean high validity, but is necessary although not sufficient condition for validity. Ebel (1978) agrees by pointing out that a necessary condition for the goodness of any test is score reliability. "The test must measure something with coherent consistency to provide scores that have the possibility of being useful." (Ebel, 1978, p.10). Smith (1972), in describing policy capturing studies, notes that a subset of trials must be repeated for each judge to allow a "test-retest" coefficient to be computed. This indicates the extent to which a subject's judgments are trustworthy, as opposed to being affected by transient states or circumstances. Test-retest reliability for the instruments in this study was examined by replicating five randomly selected cases. Thus, each subject was given twenty-seven unique cases and five replications. After the reliability coefficients were obtained, data from the five replications were deleted from further analysis.

Data obtained by computing Pearson Product Moment correlations between responses marked on the first and second presentation of the case is shown in Table 3.3. It can be seen that the physicians r_{xx} is lower for four of the five cases and the mean for the five cases is $r_{xx}=.41$ for the thirty physicians, compared with a mean $r_{xx}=.77$ for the patients,

and mean r_{xx} of .74 for the total group.

Table 3.3
Intra-Judge Reliability for 5 Replicated Cases

Levels of Cues in Replicated Cases						
Conv.	Cost	Sev.	Supp.	Patients	Physicians	Total Group
H	H	M	M	$r_{xx} = .71^*$	$r_{xx} = .42^{**}$	$r_{xx} = .74^*$
L	M	L	H	$r_{xx} = .73^*$	$r_{xx} = .26$	$r_{xx} = .64^*$
M	M	L	L	$r_{xx} = .94^*$	$r_{xx} = .28$	$r_{xx} = .80^*$
H	L	M	L	$r_{xx} = .72^*$	$r_{xx} = .72^*$	$r_{xx} = .83^*$
H	M	L	M	$r_{xx} = .75^*$	$r_{xx} = .39^{**}$	$r_{xx} = .71^*$
Total				$\bar{r}_{xx} = .77$	$\bar{r}_{xx} = .41$	$\bar{r}_{xx} = .74$
				S.D. = .10	S.D. = .18	S.D. = .08
				N = 30	N = 30	N = 60

*Significant at p less than .001 level.

**Significant at p less than .05 level.

In interpreting these results, it is important to examine the formula for Pearson Product Moment Correlation, which was used to compute r_{xx} .

$$r_{xx} = \frac{\sum (X_1 - \bar{X}_1)(X_2 - \bar{X}_2)}{NS_{x1}NS_{x2}}$$

This formula (Mehrens & Lehman, 1978, p.81) demonstrates that the coefficient is not only a function of the consistency of the responses, but also the range of the group. If a reliability estimate has a small spread in scores, the coefficient will be relatively low. If the group has a wide range of scores, the coefficient will be higher even if the accuracy of measurement is unchanged (Wesman, 1976). The standard deviations of the mean judgments for the cases that were replicated had a range of .49 to .94 for physicians,

.80 to 1.11 for patients, and .89 to 1.15 across both groups. Thus, it can be seen that the spread of responses for the patients was much wider than for the physicians, and must be taken into account in interpreting the lower reliability for physicians. Overall, the reliability coefficient of $r_{xx} = .74$ across the five cases and both groups can be considered adequate.

Data Collection

Patients. Patient subjects were contacted by telephone and arrangements made for the instrument to be completed. For approximately 2/3 of the subjects, the researcher went to the patient's home and stayed with the subject while the instrument was completed. For the remaining 1/3, data collection was done by mail or the instrument was taken to the subject, left and picked up when completed. The data were intentionally collected away from the medical setting as that is where judgments regarding compliance are made.

Physicians. Physicians who agreed to participate in the study received an instrument, completed it and returned it to the researcher. Written reminders were sent to those who consented to participate but failed to return the completed instrument. If necessary, telephone reminders and personal contact were used for follow-up.

Research Questions

The general purpose of this research was to study and compare judgments of physicians and patients regarding the likelihood of a patient's carrying out a physician's orders, as defined on the variables convenience, cost, severity of illness and support. Instruments based on Hammond's adaptation of Brunswik's lens model were developed and field tested for use in this study. This study asked the following research questions:

1. To what extent can the variance in judgments of physicians and patients be accounted for regarding the likelihood that a patient will carry out a prescribed medical regimen as defined on the variables convenience, cost, severity of illness and support?
2. What are the judgments of patients regarding the likelihood of carrying out a prescribed medical regimen?
3. What are the judgments of physicians regarding the likelihood that a patient will carry out a prescribed medical regimen?
4. Is there a difference between physicians' and patients' judgments regarding the likelihood of a patient's carrying out a prescribed medical regimen?
5. What importance do patients assign to the cues convenience, cost, severity of illness, and support when judging the likelihood of carrying out the prescribed medical regimen?
6. What importance do physicians assign to the cues convenience, cost, severity of illness and support when judging the likelihood that a patient will carry out a prescribed medical regimen?
7. Is there a difference between the importance physicians and patients assign to the cues convenience, cost, severity of illness and support when judging the likelihood of a patient's carrying out a prescribed medical regimen?

8. To what extent can demographic data be used to predict physicians' and patients' judgments, importance attached to the four cues in making those judgments, and the amount of variation accounted for in making those judgments?

Analyses

The analyses used in this study will be described in relation to the research questions and the design of the study.

Question 1. To what extent can variability in the judgments of physicians and patients be accounted for regarding the likelihood of a patient carrying out the prescribed medical regimen as defined on the variable convenience, cost, severity of illness and support? This question was addressed by examining the R^2 computed by the SPSS multiple regression formula. The R^2 represents the squared correlation between the best linear combination of the predictor variables and the actual judgments of each subject. This squared correlation can be interpreted as indicating the amount of variation in the judgment accounted for by each subject's responses and a linear relationship.

Question 2-7. These questions addressed the judgments of physicians and patients and the importance physicians and patients placed on the four cues in making the judgments. Specifically, questions 2-4 asked what are the judgments of physicians and patients and whether there is a difference between the two groups. Questions 5-7 asked what importance physicians and patients placed on the four cues and what is the difference between the importance patients and physicians assign to the four cues.

One analysis used to answer questions 2-7 was a multivariate analysis of variance for repeated measures using a Jeremy Finn program (Scheifley and Schmidt, 1975) and modified for this fractional factorial design. The dependent variable was the judgment measured over 27 cases. This analysis procedure had two sets of independent variables:

- A. One factor for design over the subjects which has two levels, patients and physicians.
- B. Three factors over the measurements, meaning the analysis provided data with 3 levels of each cue:
 - 1. Cue 1, cost, with high, medium and low levels.
 - 2. Cue 2, support, with high, medium and low levels.
 - 3. Cue 3, convenience, with high, medium and low levels.

Therefore, this was a 2X3X3X3 analysis (See Figure 3.3). The fourth cue was analyzed indirectly due to the fractional factorial design. Indirect analysis can be done by identifying that portion of an interaction that is equivalent to or an alias of the main effect. Aliases can be defined as "two factorial effects that are represented by the same comparison" (Cochran and Cox, 1957, p. 245). In a fractional replication, every factorial effect always has one or more aliases. It is imperative in any fractional design to determine the aliases for accurate interpretation. In this design, each factorial effect had two aliases, which are identified in Appendix F. The main effect for the fourth cue, severity, was found by examining the A1B1C1 and A1B1C2 interactions.

This analysis tested for significant group main effects, cue main effects, and group by cue interactions. Further, the fractional factorial design was balanced and representative (See Figure 3.1) and by clustering the cases by level of each cue, the mean judgments for each level of each cue were obtained.

	COST HIGH (H)						COST MEDIUM (M)						COST LOW (L)					
	SUPPORT						SUPPORT						SUPPORT					
	H	M	L	CONVEN.	CONVEN.	CONVEN.	H	M	L	CONVEN.	CONVEN.	CONVEN.	H	M	L	CONVEN.	CONVEN.	CONVEN.
	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L
Group 1																		
Patients																		
1																		
2																		
3																		
4																		
5																		
.																		
.																		
30																		
Group 2																		
Physicians																		
31																		
32																		
33																		
34																		
35																		
.																		
.																		
60																		

*The fourth independent variable was indirectly tested by identifying the aliases.

Figure 3.3
2X3X3X3 Analysis

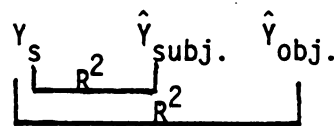
This analysis assumes independence, which was met because observations on each subject were obtained independently. With 30 subjects in each group, this analysis was also robust with respect to the violation of the assumption of a normal distribution due to the Central Limit Theorem. Further, the test was robust with respect to the violation of the assumption of equal variance because of equal cell sizes. Since this was a fractional factorial design, an additional assumption that the aliases are identified and the interactions negligible must be met for the main effects to be interpreted accurately.

Analysis using SPSS multiple regression was also used to address the research questions. This statistical technique assumes that the variables are measured on at least an interval scale and are linear and additive. Multiple regression can be used as either a descriptive or predictive tool. In this study, it was used as a descriptive tool. The four cues, convenience, cost, severity of illness and support served as the independent variables and the judgments regarding the likelihood of the patient's carrying out the prescribed regimen served as dependent variables. The multiple regression technique analyzed the relation of the 4 independent variables (cues) to the dependent variables (judgments) and yielded a beta weight for each of the independent variables. These beta weights can be interpreted as indicating the importance each subject placed on that cue in making judgments on 27 cases.

Question 8. To what extent can demographic data be used to predict physicians' and patients' judgments, importance attached to the four cues in making those judgments, and the amount of variation accounted for in making those judgments? This question was examined by looking at the multivariate analysis of variance for repeated measures for

significant group main effects, cue main effects and group by cue interactions. Further, Spearman and Pearson correlations and chi square measure of association were used to examine the relationships between demographic data, beta weights on the four cues, mean judgments and R^2 .

The other major question addressed in the study was the relationship between subjective and objective weights. Objective weights were the beta weights statistically computed by SPSS regression. Subjective weights were obtained by having subjects spread 100 points between the four cues to represent the importance the subjects thought they placed on each cue when making the judgments. Analysis was done by replacing the beta weights with the subjective weights in the regression equation, computing the judgments on the same 27 cases, and obtaining a Pearson correlation between the judgments computed with subjective weights ($\hat{Y}_{\text{subj.}}$) and the actual judgments made (Y_s). This R was squared and subtracted from the R^2 obtained by the regression analysis. The obtained difference score was then tested for significance between physicians and patients using an independent t test.



Pilot Study

A pilot study was carried out in 1978 for the purpose of field testing the instruments for this study. A brief summary of the development of the instruments and subsequent pilot study are presented here, and for further detail the reader is referred to the research report (Rothert, 1978).

Six patients and three physicians participated as subjects to field test the instrument. Patients were chosen from those who had used the health care system as a patient within the previous 2 years, and physicians

were chosen from those working in ambulatory care settings. Prior to the pilot study, similar instruments were developed for use with physicians and patients, varying only in level of terminology and medical explanation. These instruments were based on Brunswik's lens model, as adapted by Hammond, and can be found in Appendices C and D. In order to use the lens model, cues had to be identified which were thought to account for the greatest amount of variation in the judgments. Choice of the cues was based on review of the literature and interviews with at least 10 health professionals, including nurses, health educators, and physicians.

During the pilot study, subjects were strongly encouraged to give feedback and suggestions as they progressed through the instrument. Information collected from that process was used to refine the instrument for this study.

Data obtained from the instruments were analyzed using SPSS multiple regression program. No group comparison was attempted due to the small number of subjects. The amount of variation explained by the four variables indicated that the policy of the physician subjects was almost completely captured, but the patients showed a wide range of variation in R^2 . As a result of the pilot study, the design of the instrument was refined to facilitate the collection of data and enhance the potential of the instrument to capture the policy of physicians and patients.

Summary

The site for this study was the Clinical Center, an ambulatory care center located at Michigan State University, East Lansing, Michigan. Thirty physicians and thirty patients formed the two groups of subjects for this study. The physician subjects carried a case load that included hypertensive patients and were recruited from the staff of four departments

of the Clinical Center. Of the 30 physician subjects, 16 were allopathic (M.D.) and 14 were osteopathic (D.O.). Patient subjects were recruited from those seeking care at the Clinical Center. No attempt was made to directly match each physician and patient, but patients were recruited from the pool of patients seen by the physician participants. The number of patient subjects recruited from each department was equal to the number of physician subjects participating in the study from that department. Because hypertension was the disease entity presented in the study, hypertensive patients were excluded to avoid the possibility of patients identifying with their own level of illness rather than the level of illness presented in each case. The protocol for obtaining patient subjects followed the guidelines of the University Committee on Research Involving Human Subjects (UCRIHS).

This study had four independent variables (cues) with three levels of each. Judgments were made by subjects on 27 cases. The dependent variable was a judgment made on a 5-point scale for each case. Further, this was a comparative study, with 2 groups of 30 subjects each (physicians and patients). A full 3^4 design would have involved 81 cases, and would not have been feasible for subjects to complete. Therefore, a fractional factorial design was used with 1/3 replication of a 3^4 design using 27 unique cases.

The instruments used for the study were previously developed and field tested. The instruments were similar for physicians and patients, varying only in level of terminology. Hypertension was the disease entity presented in the instrument. Demographic data were collected and 34 cases were presented, consisting of a description of one level of each of the four cues, convenience, cost, severity of illness and support.

Therefore, each case consisted of four brief descriptions of cues, followed by the question "In this situation, how likely would you be (or if subject was the physician, how likely would the patient be) to carry out the treatment plan for an indefinite period of time?"

Content validity for the instruments was assessed by a panel of five experts in judgment theory. In response to a question asking how well the instruments measured judgments of physicians and patients, four experts indicated "Very Well" and one indicated "adequately." In response to a question asking how well these instruments measured the weights the patients and physicians assigned to the four cues, one indicated "exceptionally well," two responded very well," and two marked "adequately." Test-retest reliability for the instruments in this study was examined by replicating 5 randomly selected cases. Pearson Product Moment correlations were computed for responses marked on the first and second presentations of the cases. Patients mean r_{xx} was .77, physicians mean r_{xx} was .41, and for the total group, the mean r_{xx} across the 5 cases was considered adequate at .74. It was noted that the restricted range of physician judgments should be considered as a factor in the lower reliability coefficient for physicians.

Data was collected from patient subjects primarily by home visits. Physician subjects were given the instruments and asked to return them when completed.

The research questions asked in this study were:

1. To what extent can the variance in judgments of physicians and patients be accounted for regarding the likelihood that a patient will carry out a prescribed medical regimen as defined on the variables convenience, cost, severity of illness and support?

2. What are the judgments of patients regarding the likelihood of carrying out a prescribed medical regimen?
3. What are the judgments of physicians regarding the likelihood that a patient will carry out a prescribed medical regimen?
4. Is there a difference between physicians' and patients' judgments regarding the likelihood of a patient's carrying out a prescribed medical regimen?
5. What importance do patients assign to the cues convenience, cost, severity of illness and support when judging the likelihood of carrying out a prescribed medical regimen?
6. What importance do physicians assign to the cues convenience, cost, severity of illness and support when judging the likelihood that a patient will carry out a prescribed medical regimen?
7. Is there a difference between the importance physicians and patients assign to the cues convenience, cost, severity of illness and support when judging the likelihood of a patient's carrying out a prescribed medical regimen?
8. To what extent can demographic data be used to predict physicians' and patients' judgments, importance attached to the four cues in making those judgments, and the amount of variation accounted for in making those judgments?

Question 1 was analyzed using the R^2 computed from the SPSS Multiple Regression formula. Questions 2-7 were analyzed in two ways.

a multivariate analysis of variance for repeated measures using a Jeremy Finn program was used. This was a 2x3x3x3 analysis with the fourth main effect tested indirectly due to the fractional factorial design. This analysis tested for significant group main effects, cue main effects and group by cue interactions. Further, the mean judgments for each level of each cue were obtained.

Analysis using SPSS multiple regression was also used to address these questions. The multiple regression technique analyzed the linear relation of the four independent variables (cues) to the dependent variable (judgment) and yielded a beta weight for each of the independent variables.

Question 8 was examined by Spearman and Pearson correlations, chi square measure of association, and multivariate analysis of variance for repeated measures. The other major question addressed in the study was the relationship between subjective and objective weights. A Pearson correlation was obtained between the judgments computed with subjective weights and the actual judgments made. This R was then squared and subtracted from the R^2 obtained by the regression analysis. The obtained difference score was tested for significance between physicians and patients using an independent t test.

Finally, it is noted that this study is based on a pilot study carried out in 1978. Six patients and three physicians participated as subjects to field test the instruments. During the pilot study, subjects gave feedback and suggestions as they progressed through the instrument, data was analyzed using SPSS multiple regression, and the instruments were refined for this study to facilitate the collection of data and enhance the potential of the instrument to capture the policy of physicians and patients.

CHAPTER IV
RESULTS AND DISCUSSION

CHAPTER IV

RESULTS AND DISCUSSION

This chapter presents descriptive and statistical analyses of the data. The chapter is organized into two parts--results and discussion. Each part is presented in five major sections.

The first section addresses the research question related to how well the judgments of physicians and patients were accounted for regarding the likelihood that a patient will carry out a prescribed regimen as defined using the four cues convenience, cost, severity of illness and support. This question examines the strength of linear association between the independent variables (cues) and dependent variables (judgments), and is presented first because it is central to all other analyses.

In the second section, data are presented to address the three research questions related to the judgments of patient adherence to a prescribed regimen. Specifically, the questions addressed are: (1) what were the judgments of patients; (2) what were the judgments of physicians; and (3) was there a difference between the judgments of patients' and physicians'.

The third section presents data related to the importance patients and physicians placed on the four cues in making judgments regarding the likelihood of patients' adhering to a prescribed regimen. This section responds to the following research questions: (1) what importance did patients assign to the four cues; (2) what importance did physicians

assign to the four cues; and (3) was there a difference between the importance patients and physicians assigned to the four cues.

The fourth section addresses the final research question asking the extent to which demographic data could be used to predict physicians' and patients' judgments, importance attached to the four cues in making those judgments, and the amount of variation accounted for in making those judgments.

Finally, the fifth section presents results of supplemental analyses of data. The relation between subjective and objective weights are examined as well as descriptive data not directly related to the specific research questions. This data is presented for its usefulness in providing a broader understanding of the individual subjects and context in which the study was carried out.

Strength of Association

In determining the use of cues by patients and physicians, one of the analyses carried out was multiple regression. When applying the regression equation, the linear association between the independent variables and dependent variables must be examined to determine the usefulness of the data and to correctly interpret the analysis. The correlation between each subject's actual judgments and judgments generated from objective weights were squared, and this R^2 indicated the amount of variance that was accounted for in each subject's judgments. How much do the values of the dependent variable (judgment) as they vary, coincide with the values of the independent variables (cues) as they vary? (Cohen & Cohen, 1975) The measure R^2 defines the magnitude of the relation, that is, the amount of the variation on the dependent variable accounted for by a linear combination of the independent variables.

For this study, a multiple regression analysis was done on data from each of the 60 subjects across the 27 cases. An R^2 was obtained for each subject, indicating the strength of linear association between the four cues and the judgments for each subject. Table 4.1 presents data regarding R^2 obtained from this analysis.

Table 4.1
Means, Ranges, Standard Deviations and Medians of R^2 Across
Judgments Based on All Cues

Subjects	Mean R^2	Standard Deviation	Lowest & Highest R^2	Median R^2
Patients N=30	.53	.24	.00-.86	.58
Physicians				
D.O. N=14	.67	.13	.42-.88	.67
M.D. N=16	.69	.12	.48-.84	.73
Total Phys. N=30	.68	.12	.42-.88	.70
Total Subjects N=60	.61	.21	.00-.88	.66

It can be seen in Table 4.1 that across 30 patient subjects, the mean R^2 was .53 indicating that 53% of variation in patients' judgments was accounted for by a linear combination of the four cues. The amount of variation accounted for in the judgments varied greatly, particularly among patients. In looking at the lowest and highest R^2 column in Table 4.1, it should be noted that the lowest value for patients dropped to zero. Three patient subjects used the highest number on the 5-point scale when judging all 27 cases, indicating they would always carry out all

of the prescribed regimen. Since there was no variation in these judgments, the amount of variation accounted for was zero. These three patients were the only subjects with zero R^2 . Because of the range of scores, the median is presented as a measure of central tendency less affected by extreme scores than the mean.

Over 60 subjects, an average of 66% of the variance in judgments on the cues could be accounted for by a linear combination of the four cues in this study. However, the patients' average was 53%, more than 15% less than the physicians' average of 68%. Using the medians as measures of central tendency of R^2 , there was still a difference of 12% between physicians and patients. There was little difference between the allopathic and osteopathic physicians in accounting for the variation in judgments.

Judgments

Each subject made a judgment of the likelihood of a patient's adhering to a treatment plan on 27 different cases. These judgments are examined in relation to patients' judgments, physicians' judgments, and the difference between patients' and physicians' judgments.

Patients' Judgments. The judgments of patient subjects were in response to the following question asked for each case: "In this situation, how likely would you be to carry out the treatment plan for an indefinite period of time?" Patients made the judgment based on the following 5-point scale:

1. Very certain that you would not carry out all of the treatment plan
2. Probably would not carry out all of the treatment plan

3. May or may not carry out all of the treatment plan
4. Probably would carry out all of the treatment plan
5. Very certain that you would carry out all of the treatment plan

Patients made this judgment for each of the 27 unique cases and a mean of the 27 judgments was computed for each subject. A grand mean was then computed by averaging the means of the 30 patient subjects. This mean across the 30 patients was 4.13 on the 5-point scale, with a standard deviation of .59. Thus, patients were inclined to judge that they would follow the physicians' orders, with a mean judgment greater than four on a 5-point scale.

Physicians' Judgments. Physician subjects also made judgments across 27 unique cases. Physicians responded to the question "In this situation, how likely would the patient be to carry out the treatment plan for an indefinite period of time?" Physicians used the following scale in making the judgments:

1. Very certain that the patient would not carry out all of the treatment plan
2. Patient probably would not carry out all of the treatment plan
3. Patient may or may not carry out all of the treatment plan
4. Patient probably would carry out all of the treatment plan
5. Very certain that the patient would carry out all of the treatment plan

The analysis used with the data on patients' judgments was also used on physicians' judgments. A mean of each physician's judgments was computed and a grand mean across the 30 physician subjects was obtained. The mean for the 30 physician subjects was 2.99 on the 5-point scale with

a standard deviation of .38. Thus, physicians were inclined to judge that patients may or may not carry out the treatment plan.

Comparison of Physicians' and Patients' Judgments. A descriptive analysis indicated the mean judgments of physicians and patients was 1.14 points apart with physicians' mean judgment 2.99 and patients' mean judgment 4.13 on a 5-point scale. Thus, physicians were less likely than patients to judge that patients would carry out the treatment program.

A multivariate analysis of variance was carried out on the data. Because the repeated measures or 27 cases used in this study were themselves part of a design, one must first look at the interaction between groups and profile of responses over the 27 cases. Examining whether the judgment profiles of physicians and of patients across the repeated measures are the same is a multivariate test. If the judgment profiles of both groups are the same, it is meaningful to ask in general which group is higher. However, if the profiles are not the same, it implies that the difference between physicians and patients is not the same over all the levels of the four cues. Therefore, only if the multivariate test is not significant is it useful to examine the group main effects or overall test of judgments between patients and physicians. Since the multivariate test of groups by measures interactions addresses the design of the cases and tests the pattern of using the four cues in each group, it will be discussed in the section addressing comparison of patients' and physicians' use of cues.

CUES

As discussed in the previous section, each subject made judgments on 27 unique cases and these judgments were the dependent variables in the

study. The four cues, convenience, cost, severity of illness and support were each defined on three levels, high, medium and low, and were the independent variables in the study. Each case consisted of descriptions of one level of each of the four cues followed by a question asking for a judgment on that case. Several analyses were used to examine the patients' use of cues. One analysis was multiple regression. Multiple regression analysis has two major purposes, prediction and explanation. If prediction were the only focus, then a study of the magnitude of R^2 would satisfy the research question. However, in much of behavioral research, including this study, the goal is to explain a phenomenon, that is, to understand the relations between the independent variables and a dependent variable, and relations among the independent variables. Thus, interest focuses on the whole regression equation and regression coefficients or beta weights. (Kerlinger and Pedhazur, 1973). The multiple regression technique was used to analyze the linear relation of the four independent variables (cues) to the dependent variable (judgment). This analysis yielded a beta weight or partial regression coefficient. The term partial regression coefficient refers to the weight to be applied to an independent variable when other specified independent variables are in the equation (Cohen & Cohen, 1975).

The relation of the independent variables and dependent variable can be seen in the following equation. It is important to note that standardized beta weights were used and thus no constant was represented in the equation.

$$\hat{Y} = \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4$$

$\hat{Y}$ =Predicted judgment

$\beta_{..}$ =Standardized beta weight

$x_{..}$ =Independent variable or cue

Thus, the "best fit" predicted judgment for a subject can be expressed as an additive combination of cues multiplied by their beta weights in the equation.

The analysis used for this study was an SPSS subprogram for step-wise inclusion of the independent variables into the equation. This means that the variable that explained the greatest amount of variance in the dependent variable was entered first, the variable that explained the greatest amount of variance in conjunction with the first was entered second, and so on. Thus, the independent variable which is chosen for entry is the one which has the largest squared partial correlation with the dependent variable. One or more of the variables may never be entered into the regression equation if the statistical criteria are not met (Kim & Kohout, 1975). For this study, the statistical criteria for inclusion of a variable into the equation after the first variable, were as follows: (1) The F ratio for a given variable equivalent to the value that would be obtained if that variable were brought in on the next step was equal to or greater than .01; and (2) the proportion of the independent variable considered for inclusion not explained by the independent variables already in the regression equation was equal to or greater than .0001. Since the purpose of this analysis was explanatory, the criteria were kept at a minimal level.

In using multiple regression analysis, it is important to be aware of the correlation among the independent variables. This is called the problem of multicollinearity. Cohen and Cohen (1975) note that substantial correlation or multicollinearity among a set of independent variables creates three distinct problems-the substantive interpretation of partial coefficients, their sampling stability, and computational accuracy. In this study, the correlation between the four cues or four independent variables was zero due to the orthogonal design, and thus

there was not a problem of multicollinearity.

Data from analyses using multiple regression and multivariate analysis of variance procedures are presented to examine the importance subjects assigned to each of the four cues in making judgments of the likelihood of a patient's adhering to a prescribed regimen. The following section includes a description of findings related to patients' use of the cues, physicians use of the cues, and comparison between patients' and physicians' use of the cues.

Patients' Use of the Cues. Standardized beta weights for the four cues were obtained for each patient by the multiple regression procedure described. These beta weights were then averaged across the 30 patient subjects and the results can be seen in Table 4.2.

Table 4.2
Means and Standard Deviations of Standardized
Beta Weights for Patients On All Cues

Cue	Mean	Standard Deviation
Convenience	.19	.27
Cost	-.05	.20
Severity	.42	.31
Support	.24	.25

These mean beta weights can be interpreted as the average relative importance placed on each cue by the 30 patient subjects. Thus, the relative importance placed on the cue convenience was equal to .19 units. In interpreting the weight for the cue cost, the negative sign was indicative of the way cost was defined in the instrument. This means that .05 was the magnitude of the importance placed on that cue and the negative sign reflects the finding that the greater the cost, the less

likely the person would be to follow the physician's orders. As shown in Table 4.2 patients placed greatest importance on the cue severity (.41), much less on support (.23) and convenience (.19) and very little on cost (-.05).

Physicians' Use of Cues. Analysis using the SPSS program for multiple regression was also carried out to determine the importance the 30 physician subjects placed on each of the four cues in making judgments of patients' adherence to a prescribed regimen. Standardized beta weights were obtained for each physician and averaged across the 30 physician subjects. The results are shown in Table 4.3

Table 4.3
Means & Standard Deviations of Standardized
Beta Weights for Physicians on All Cues

Subjects	N	Convenience	Cost	Severity	Support
Allopathic Physicians (M.D.)	16	.36 ^a (.17)	-.12 (.19)	.37 (.23)	.50 (.24)
Osteopathic Physicians (D.O.)	14	.32 (.13)	-.22 (.10)	.37 (.18)	.55 (.16)
All Physicians	30	.34 (.15)	-.16 (.16)	.37 (.20)	.52 (.20)

^aThe first number given is the group mean. Standard deviations are in parentheses.

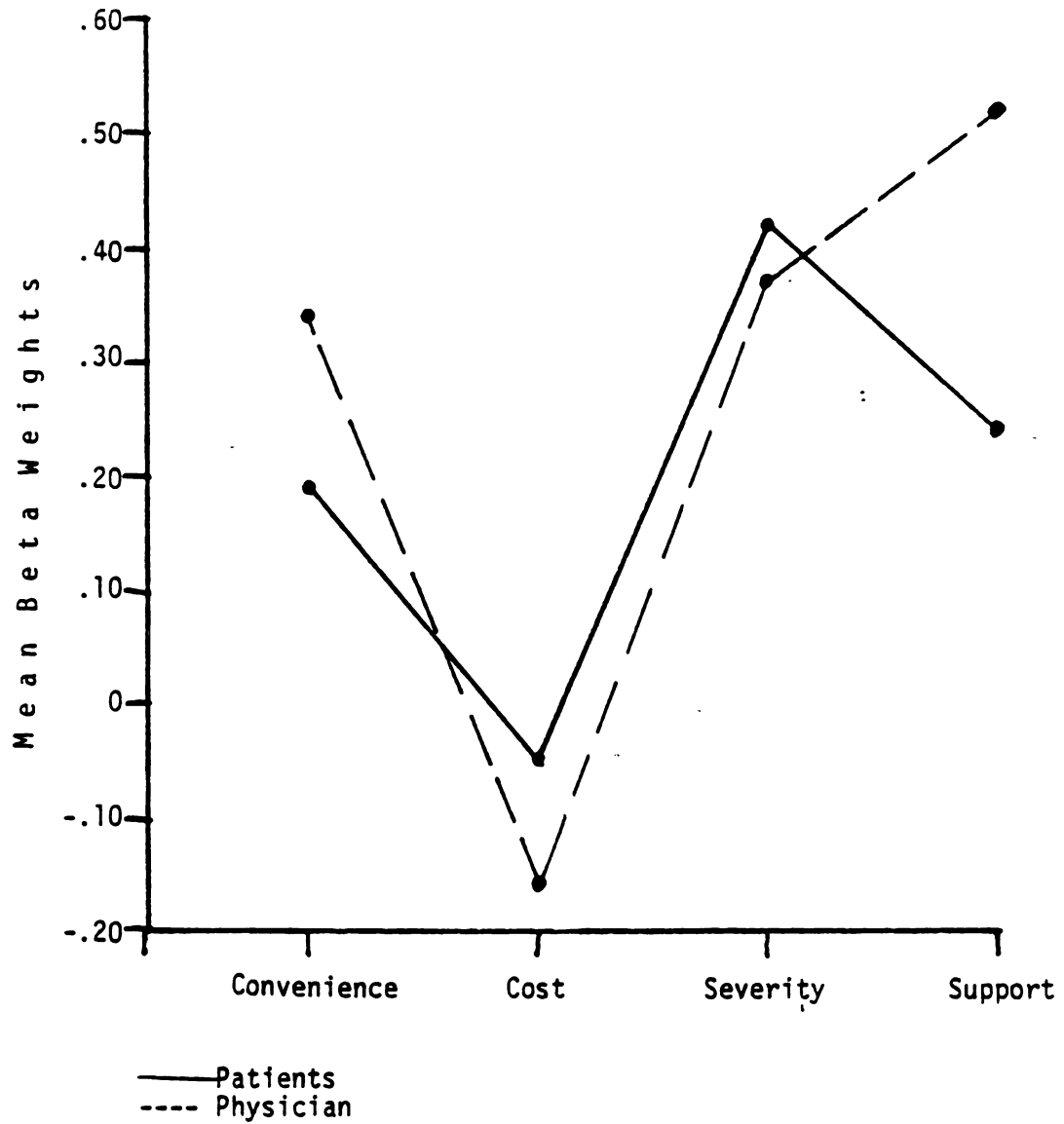
These mean beta weights can be interpreted as the average relative importance placed on each cue by the 30 physician subjects. It can be seen that the difference between the mean beta weights for all osteopathic (D.O.) and allopathic (M.D.) physicians appears rather minor, with the same rank order noted for both. Osteopathic physicians put

somewhat greater importance on cost, but otherwise the difference between the two groups is .05 units or less. Overall, physicians placed greatest importance on support, with a mean weight of .52. Severity was second in importance at .37 with convenience not far below at .34. Cost received little importance with a weight of -.16.

Comparison of Patients' and Physicians' Use of Cues. This section addresses the following major question: Do patients and physicians use the four cues (convenience, cost, severity and support) in a similar or dissimilar way when making judgments of the likelihood that a patient will adhere to a medical regimen?

The way in which patients and physicians use cues was compared by examining the beta weights obtained on each subject. The beta weights for each cue were averaged across the group of 30 patients and 30 physicians, and are presented in Figure 4.1. Overall, physicians and patients demonstrated a similar pattern in the use of cues cost, convenience and severity. The slope and direction are similar with the exception of support. Physicians placed somewhat greater importance on the cues convenience and cost, although the latter was demonstrated as an inverse relationship. Physicians placed significantly greater emphasis on the cue support. As Figure 4.1 shows, the only cue assigned a higher weight by patients than physicians was severity of illness, and the magnitude of difference was small. The order of magnitude for cues was the same for physicians and patients, except physicians placed support first and severity second, and patients placed severity first and support second. Thus, comparison of the beta weights averaged over physicians and patients indicated physicians placed substantially

Figure 4.1
Comparison of Physicians' and Patients'
Mean Beta Weights for All Cues.



greater importance than patients on the cue support, with the cues cost, convenience and severity used in a rather parallel fashion.

The way in which patients and physicians used the cues in making the judgments was also studied by multivariate analysis of variance for repeated measures program modified for a 1/3 replicate of a 3^4 fractional factorial design. Finn (1974) notes that the multivariate approach to analysis is usually appropriate when a study contains multiple outcome, or dependent, or criterion measures. In this study, the multiple repeated dependent measures were the 27 cases. The multivariate approach attends to the data as a whole and yields test statistics that are simple extensions of their univariate counterparts. Use of multivariate analysis allows for study of the contribution of structured and identifiable independent variables to the explanation of between-individual or between-group variation in one or more criterion measures (Finn, 1974). The analysis procedure in this study had two sets of independent variables.

- A. One factor for design over the subjects which had two levels, patients and physicians.
- B. Three factors over the measurements, meaning the analysis provided data on three cues (cost, support, convenience) with three levels of each cue (high, medium, and low). The fourth cue was analyzed indirectly due to the fractional factorial design. By identifying the aliases or equivalent interactions, (See Appendix F), severity was tested by examining the A1B1C1, A1B1C2 interactions. Since there were two degrees of freedom to test the three levels of each cue, two simple contrasts were used in the analysis

(e.g. A-1-A3, A-2-A3).

Interpretation of the results of this analysis must be carefully made taking into account the design of the study. In this fractional factorial design, main effects are equivalent to 4-way interactions, and interactions are equivalent to other interactions as identified in the list of aliases (Appendix F). In order for main effects to be accurately and fully interpreted, the interactions must be assumed negligible. Therefore, the interactions must be examined first.

The initial question addressed was whether or not the profile of means associated with the 27 measures was identical from group to group. Were there any repeated measures or judgment profiles by group interactions? Were patients and physicians using the cues differently? The results of this test (cues by groups) are displayed in Table 4.4. Having been significant at p less than .0001, the test indicated that physicians and patients did use at least one of the cues differently. The multivariate test for cues or common profile of means over 60 subjects is also displayed in Table 4.4. For this test, the profile of judgments across the 27 cases was significantly different at p less than .0001. Given the significance of the interactions test, the profiles of the patients and physicians are not the same. Thus, it is not meaningful to find a common profile explaining the judgment of all subjects.

Table 4.4

Multivariate Analysis of Variance for Cues
Over All Subjects and Cue by Group Interactions

Sources of Variance	df	Multivariate F-Ratio	p less than
Cues X Groups	26,33	4.89	.0001
Cue	26,33	16.57	.0001

The univariate F test of the main effect between the two groups was 80.68. Therefore, with 1 and 58 degrees of freedom, the test was significant at p less than .0001. There was a significant difference in the judgments of physicians and patients. However, because the test for interaction of groups by cues was significant (p less than .0001), the main effect of the two groups or difference in overall judgments of the two groups was not meaningful to examine. This is explained by the fact that "significant interaction" indicates the difference between the two groups cannot be stated in general terms because the difference between the two groups is not constant through all the levels of the four cues.

Thus far in the analysis, it has been statistically demonstrated that there is an interaction between groups and cues. At this point it is important to identify where the differences are. Is the interaction between the two groups a simple effect of cues, or is the difference an interaction among the cues that is similar between the two groups? To assist in locating the difference, use of the cues by groups was visualized by graphing the mean judgments of physicians and patients for each level of each cue. Since the fractional factorial design used in this study was balanced and representative (See Figure 3.1), the

cases could be clustered by level of each cue and mean judgments obtained. A comparison of the relation between the levels of cues and judgments is displayed in Figure 4.2. This figure shows the mean judgments for physicians and patients at each level of the cues. Mean judgments of physicians were lower than mean judgments of patients for each point of each cue. Further, the slope of the lines was very similar for the three levels of convenience, cost, and severity. Differences can be noted on the lines representing the mean judgments at the low, medium and high levels of support. For cost, convenience, and severity, the distance between the points representing the physicians' judgments and the points representing the patients' judgments remain approximately equal for the three levels, with a small difference noted between the three levels of cost. For support, there is an obviously greater distance between the patients' and physicians judgments at the low level than at the high level.

With main effects equivalent to 4-way interactions, and interactions equivalent to other interactions in this study, representation of cues (Figure 4.2) cannot be assumed to be a simple representation of the main effect of each cue. The use of each cue by physicians and patients may well be an interaction effect between levels of several cues. This raises questions of interpretation, but it can be said that whether due to interaction or not, patients and physicians mean judgments at each level of convenience, cost and severity followed a similar profile with physicians consistently lower in their judgments than patients. Further, although physicians remained lower than patients in their mean judgments for the levels of the cue support, the slope of the line was much greater in magnitude between low, medium and high levels for physicians than for patients.

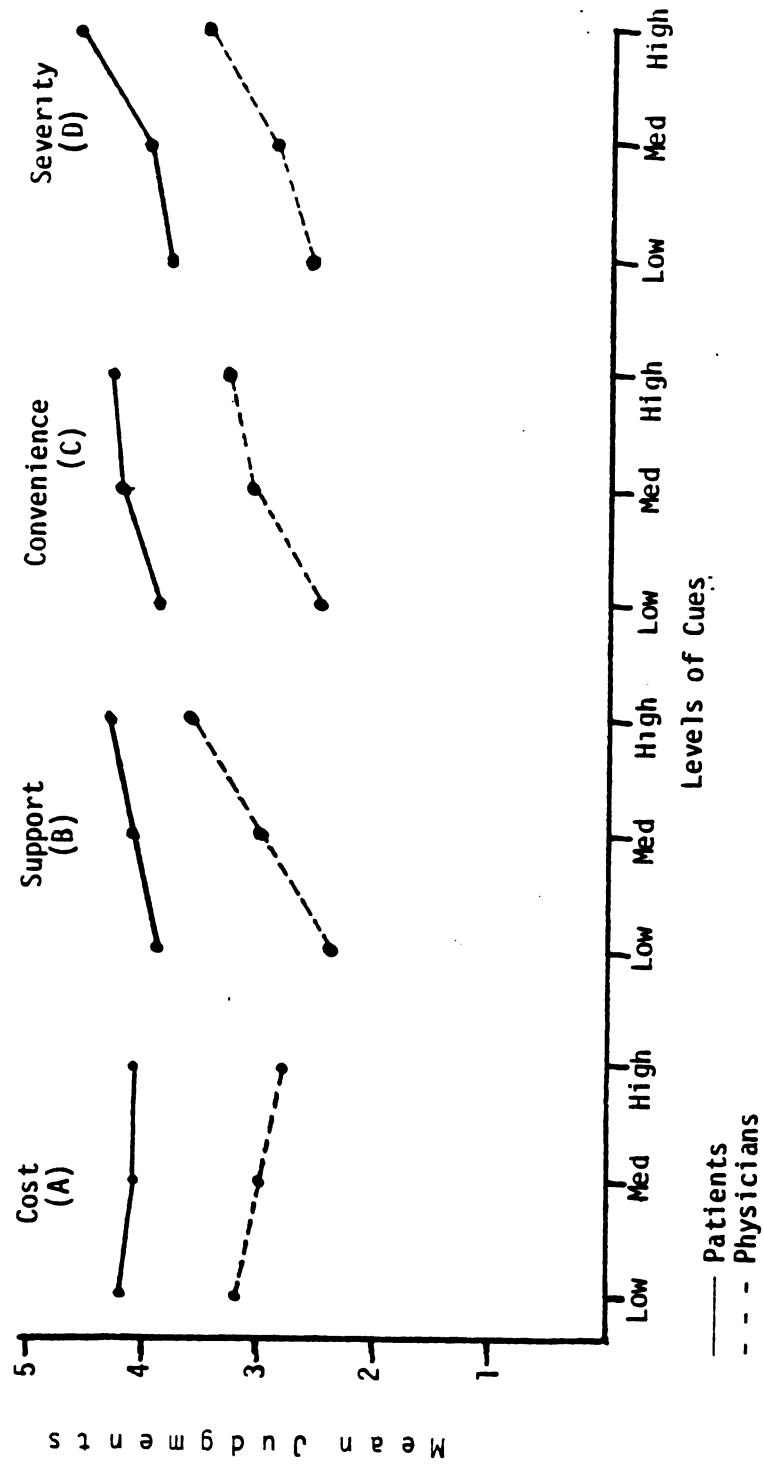


Figure 4.2
Comparison of Physicians' and Patients' Mean Judgments at Low, Medium and High Levels of All Cues

In visualizing the use of cues, a similar pattern was seen in physicians' and patients' use of three of the cues (cost, convenience and severity), and a difference was noted in the use of the cue support. Further, there appeared to be an interaction in the use of the cues cost, convenience, and severity compared with support, and this interaction appeared to be stronger in physicians than patients. To further analyze this interaction, univariate analysis of variance was used. The list of variables and univariate analysis testing each variable is presented in Table 4.5. Among all the interactions between groups and combinations of cues, it can be seen that B1C1 (B=support; C =convenience) is the only significant interaction. This result implies significance of three-way interactions among group, support, and convenience. With partitioning of the alpha level among the 26 variables, this interaction is significant at the p less than .05 level (p less than .0019), but not at the p less than .01 level (p less than .0004) of significance. To further examine this three-way interaction of group by support by convenience, graphs were made of the mean judgments of cases clustered by level of the BC interaction for each group (Figure 4.3).

Table 4.5
Univariate Analysis of Variance of Groups
by Cues Interaction^a

Variable ^a	Hypothesis Mean Sq.	Univariate F	P less than
A1 ^b	2.2299	2.7178	.1047
A2	1.8750	5.6504	.0208
B1	35.8893	30.9232	.0001
B2	9.4453	23.1895	.0001
C1	13.4818	14.5695	.0004
C2	.0454	.1051	.7471
A1B1C1	.0077	.0072	.9327
A1B1C2	.0454	.0447	.8333
A1B1	.4668	2.4561	.1226
A1B2	.0005	.0014	.9706
A2B1	.5042	1.8637	.1775
A2B2	.0125	.0301	.8628
A1C1	.0076	.0284	.8669
A1C2	.5671	1.8262	.1819
A2C1	.2042	.7900	.3778
A2C2	.0681	.2234	.6383
B1C1	3.0247	11.0990	.0016
B1C2	.4741	1.8714	.1766
B2C1	1.2518	4.9268	.0304
B2C2	.0222	.0971	.7565
A1B2C1	.9481	2.4683	.1217
A1B2C2	.0111	.0279	.8681
A2B1C1	1.6333	2.9247	.0926
A2B1C2	.7111	1.6407	.2054
A2B2C1	.6250	1.0641	.3066
A2B2C2	.0083	.0226	.8810

a) df - 1,58 for each test

b) A1, A2=Cost; B1, B2=Support; C1, C2=Convenience;
A1B1C1, A1B1C2=Severity

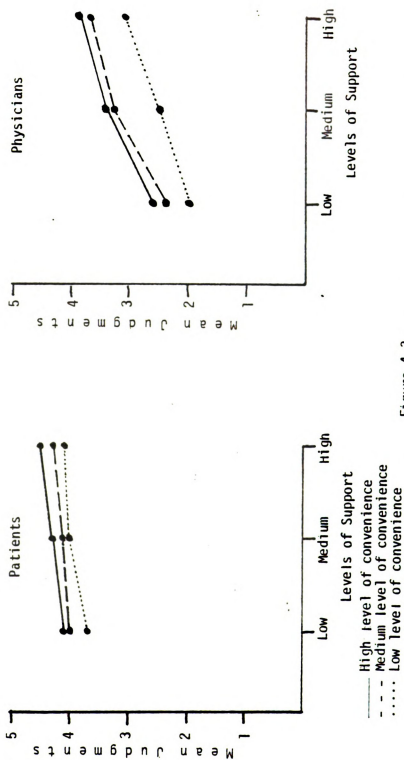


Figure 4.3
 Interaction Between Support and Convenience (B C)
 for Patients and Physicians

A mean was computed of the judgments of patients on the three cases containing a high level of severity and low level of cost, and for comparison the mean judgments of physicians was computed on the same cases. This process was repeated for all three levels of the cues as shown in Figure 4.3. Further, since the AD interaction (A=cost; D=severity) was identified as equivalent to or an alias of the BC interaction (Appendix F), the mean judgments by level of the AD interaction were computed and are displayed in Figure 4.4. Comparing the AD interaction for physicians and patients, little difference was noted between groups. Examination of the BC interaction by groups indicated that the medium level of the interaction had a different profile between physicians and patients. There was a gentle slope downward between the high and medium point on the line for patients and physicians. However, between the medium and low points on the line, patients remained level and physicians had a sharp drop. While there was no way to separate the BC interaction from the AD interaction in this design, the graphs would suggest the possibility that the two groups were using the BC interaction somewhat differently.

To further explain the use of interactions of the cues by physicians and patients, multivariate analysis of variance test of the groups by interactions among the cues is shown in Table 4.6.

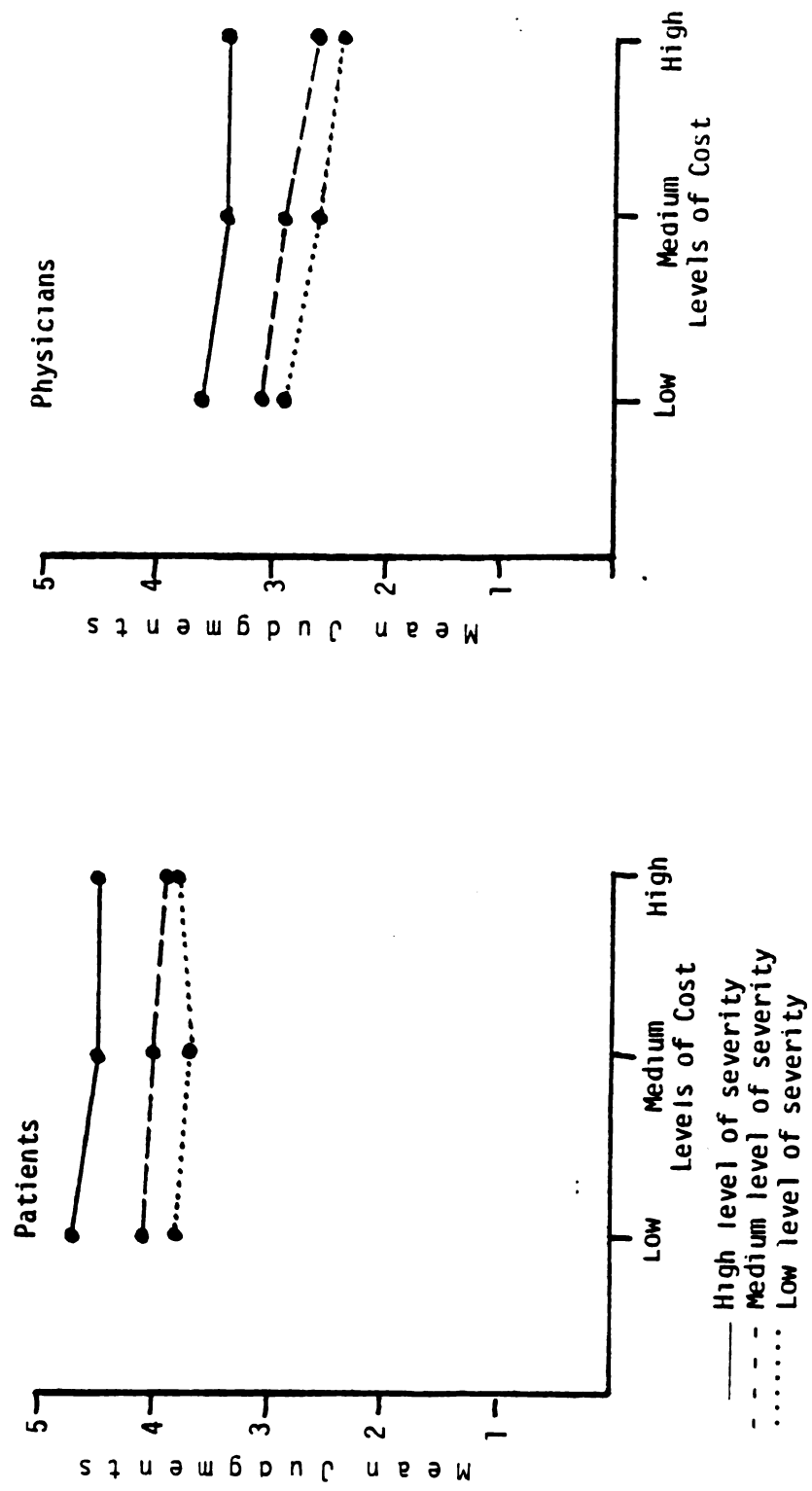


Figure 4.4
Interaction Between Cost and Severity (A C)
for Patients and Physicians

Table 4.6
Multivariate Analysis of Variance for Groups by Interactions
Among the Cues

Sources of Variance	df	Multivariate F-Ratio	p less than
Groups by Interactions Among Cues	18,41	2.18	.0197

This test indicated that the difference between how patients and physicians responded to interactions of the cues was significant at approximately p less than .0002. If the number of tests being done is considered, a conservative level of alpha, that is, .01, might be used to judge significance, and then the results of this test would be at most marginally significant.

It can be seen in Figure 4.2 that the four graph lines representing mean judgments in each group are generally similar for each cue, but within the groups they are different. The data suggested that the significance of the group by cue interaction may be attributed to the interaction among the cues. This interpretation of the data would mean that both physicians and patients used complex judgments, and that the direction of the weighting was similar, but differed in the degree of judgment of each cue.

To better understand how each group might be using the cues, data from patients and physicians were analyzed separately. The use of cues was tested separately for physicians and for patients. As seen in Table 4.7, the multivariate analysis of variance test was significant (p less than .0086) for the test of profile of cues within the group of physicians, and the same analysis was not significant for

the profile of cues within the group of patients (p less than .5694).

Table 4.7
Multivariate Analysis of Variance for Profile of Cues
Tested Separately for Physicians and Patients

Sources of Variance	df	Multivariate F-Ratio	p less than
Profile of Cues Within Group of Patients	26,4	1.01	.5694
Profile of Cues Within Group of Physicians	26,4	15.06	.0086

It is recognized that a multivariate test which is significant at p less than .5694 could statistically be interpreted as being a terminal point of the analysis. This would prevent further examination of the data related to the profile of use of cues within the group of patients. However, the purpose of this research is to examine how patients and physicians use the cues in making judgments, and further analysis will be described.

A high correlation between significant and nonsignificant tests for cue interactions was found in the univariate analyses for physicians and patients (See Appendix G). By partitioning .05 level of alpha among the 18 variables and using alpha = .003, the six triple ABC interactions (A=cost, B=support; C=convenience) were all significant. Further, no other interactions were significant at p less than .003 in either group. The ABC interaction is equivalent to interactions in combination involving each of the four cues due to the fractional design.

It is impossible to separate one interaction from another. However, the findings suggest the possibility that both physicians and patients were making judgments using an interaction of the cues in the cases, as represented by the ABC interaction. To further explore this possibility, the ABC interaction was visually represented by graphs (Figure 4.5, 4.6) for both physicians and patients. The graphs represent the mean judgments of the 30 physicians and 30 patients for each case, with the case patterned to represent all possible combination of levels of the three cues. This can be done because the design is balanced and representative, and each case is one combination of levels for the cues cost, support, and convenience. The figures display a complex disordinal interaction for both physicians and patients across the levels of cues cost, support, and convenience.

Further, the multivariate analysis of variance test for group by triple interactions of cues was found not significant at p less than .0222 indicating there was not a significant difference in how patients and physicians were using the ABC interactions (See Table 4.8). Tests of separate groups indicated the physicians were using the interactions at a level of significance p less than .0001, and patients at p less than .0003. Thus, both patients and physicians were using the ABC interactions at a significant level in making their judgments, and there was not a significant difference in how patients and physicians were using the interactions. With the finding that physicians and patients were responding to interactions of the cues, further analysis of the main effects of the cues is not meaningful within the design of this study.

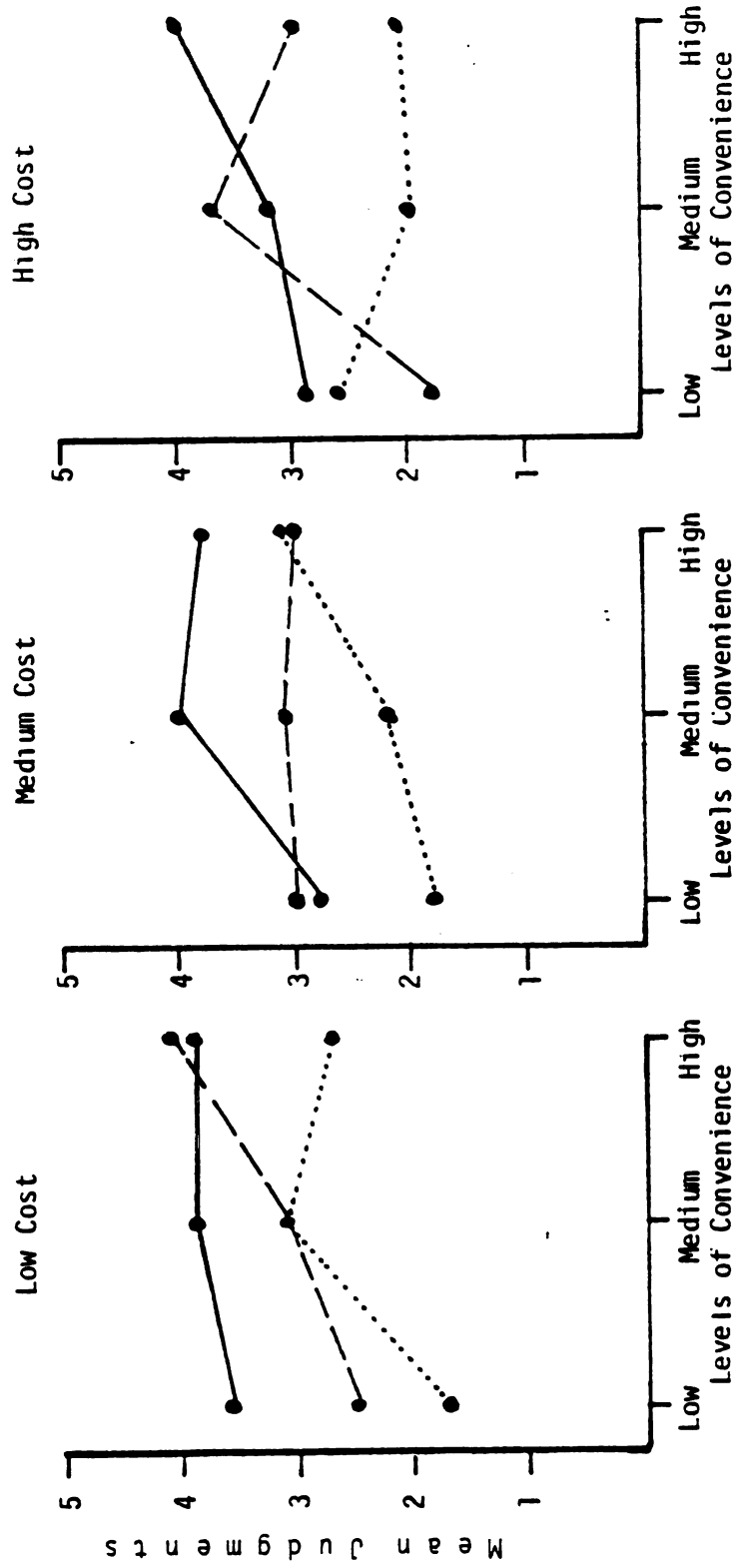


Figure 4.5
Interactions Among Cues Cost,
Support, and Convenience (A B C) for Physicians

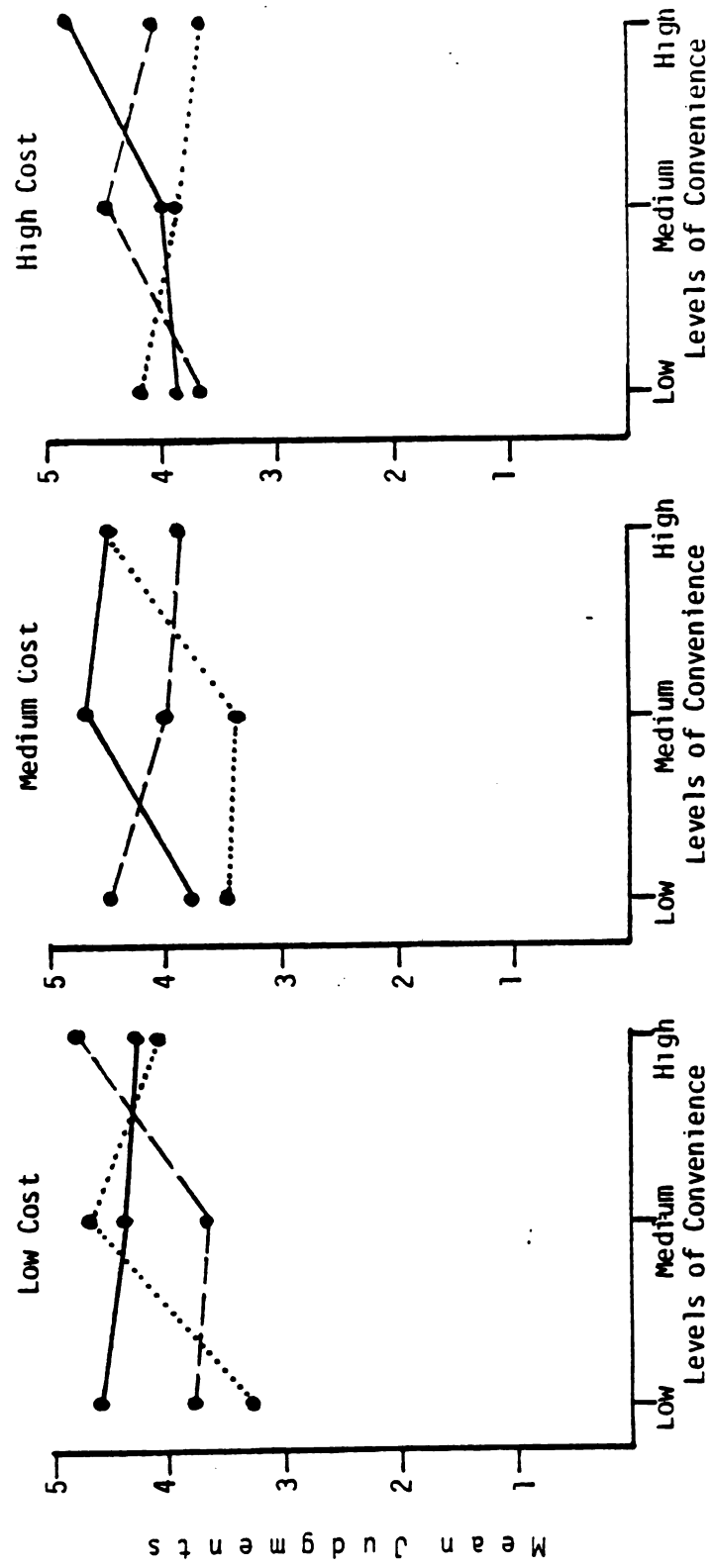


Figure 4.6
 Interactions Among Cues Cost, Support, and Convenience (A B C) for Patients

Table 4.8

Multivariate Analysis of Variance for ABC Interactions
by Groups and by Physicians and Patients Separately

Sources of Variance	df	Multivariate F-Ratio	p less than
ABC Interaction x Groups	6,53	2.72	.0222
Profile of ABC Interaction Within Group of Patients	6,24	7.05	.0003
ABC Interaction Within Group of Physicians	5,24	14.14	.0001

To summarize, a comparison of how physicians and patients used cues in making judgments of the likelihood of patients' adhering to a prescribed regimen was descriptively shown using mean beta weights of physicians and patients, and statistically analyzed using a multivariate analysis of variance procedure for repeated measures. Comparison of the beta weights, as summarized in Figure 4.1, suggested physicians and patients demonstrated a similar pattern of weighting the cues cost, convenience and severity, but differed on the cue support. Physicians placed substantially greater importance than patients on the cue support.

Specific analysis of how physicians and patients used the cues was interpreted with caution since the design of the study was a 1/3 replicate of a 3^4 fractional factorial and full interpretation of main effects can only be accomplished when 3 and 4-way interactions are assumed negligible. The multivariate analysis of variance test for repeated measures by group interactions was significant a p less than .0001. This test indicated that physicians and patients did use at least one of the cues differently. Use of the cues by groups was visualized by

graphing the mean judgments of physicians and patients for each level of each cue. Patients' and physicians' mean judgments at each level of convenience, cost and severity followed a similar profile with physicians consistently lower in their judgments than patients. Further, although physicians remained lower than patients in their mean judgments for the levels of the cue support, the slope of the line was much greater in magnitude between low, medium and high levels for physicians than for patients.

To further examine the groups by cues interaction, univariate analysis of variance was used. Among all the interactions between groups and combinations of cues, BC (B=support; C=convenience) was the only significant interaction. Graphs were made of the BC interaction for each group. Further, since the AD interaction (A=cost; D=severity) was identified as equivalent to or an alias of the BC interaction, this interaction was also graphed for each group. Comparing AD interaction for physicians and patients, little difference was noted between groups. Examination of the BC interaction by groups indicated the medium level of the interaction had a mildly different profile between physicians and patients. While there is no way to separate the BC interaction from the AD interaction in this design, the graphs suggested the possibility the two groups were using the BC interaction somewhat differently.

To further explain the use of interactions of the cues by physicians and patients, multivariate analysis of variance test of the groups by interactions among the cues was done. This test was at best marginally significant, with p less than .0197. To better understand how each group might be using the cues, use of cues was tested separately for physicians and for patients. The multivariate analysis of variance test was significant (p less than .0086) for the test of profile of cues

within the group of physicians, and the same analysis was not significant for the profile of cues within the group of patients (p less than .5694). Further examination revealed a high correlation between significant and nonsignificant tests for cue interactions in the univariate analyses for physicians and patients. The six ABC interactions (A-cost; B-support; C-convenience) were all significant, using a partitioned alpha level of p less than .002. In this design, it is impossible to separate one interaction from another. However, the findings suggest the possibility that both physicians and patients were making judgments using an interaction of the cues in the cases, as represented by the ABC interaction. Graphs of the ABC interaction of physicians and patients were consistent with this interpretation, displaying a complex disordinal interaction for both physicians and patients across the levels of cues cost, support and convenience.

The multivariate analysis of variance test for group by triple interaction of cues was found not significant at p less than .0222, and in tests of the separate groups, physicians were using the ABC interaction at a level of significance p less than .0001, and patients were using the interactions at a significant level of p less than .0003. Thus, both patients and physicians were using the ABC interactions at a significant level in making their judgments, and there was not a significant difference in how patients and physicians were using the interactions. With the finding that physicians and patients were responding to interactions of the cues, further analysis of the main effects of the cues was not meaningful within the design of the study.

There is no way to separate the interactions from the main effects when the interactions are significant. However, visual display of the data and multiple analyses have suggested in this study that physicians

and patients used the cues cost, convenience and severity in a similar way, and physicians responded to a greater extent than patients to the cue support. Further, these results suggest both patients and physicians used an interaction of the cues in making the judgments rather than responding to each cue alone.

Relation of Demographic Data to Judgments, Use of Cues and R^2

The final research question asked the extent to which demographic data could be used to predict physicians' and patients' judgments, importance attached to the four cues in making those judgments, and the amount of variation accounted for in making those judgments. Can individuals be grouped by demographic factors so that a prediction can be made of their judgment of patient adherence and their use of cues in that judgment? Can groups of people be identified as making judgments that can be explained by the four cues, and others identified as less likely to have their judgments explained by the four cues?

Demographic data were collected using the instruments in this study (see Appendices C and D). In order for any predictable relationship to be demonstrated, it would be necessary to have variance on the predictor and criterion variables. Further, there would need to be a substantial relationship between characteristics of the subject and the variable to be predicted, that is either mean judgment, beta weights or R^2 . Table 4.9 shows demographic data obtained for all 60 subjects. It can be seen that there is not a marked difference between physicians and patients in any category. Further, the frequency is high in one or two categories of the variables, and low in the remaining levels. Chi square measure of association showed no significant association between sex and mean judgments, or beta weights on any of the cues. Further, no

Table 4.9
Demographic Data for Patients and Physicians

Variable	Patients N=30	Physicians N=30 ^a	Total Group N=60
Age			
21-30	11	5	16
31-40	12	14	26
41-50	2	3	5
51-60	1	5	6
61-70	2	1	3
71-80	1	0	1
81-90	1	0	1
Sex			
Female	23	5	28
Male	7	25	32
Marital Status			
Married	20	26	46
Divorced	2	1	3
Widowed	2	0	2
Single	5	2	7
Separated	1	1	2
Number of Children in Home			
0	12	14	26
1	6	2	8
2	10	9	19
3	1	4	5
4 or more	1	1	2
Number of Other Adults in Home			
0	7	5	12
1	20	23	43
2	1	2	3
3	1	0	1
4 or more	1	0	1

^aAge for physicians was obtained for 28 physicians

significant relationship was found between marital status and mean judgments or beta weights of each of the four cues. Pearson product moment correlations were computed to determine if a relationship existed between demographic variables age, number of children in the home, and number of adults in the home, with the variables mean judgment, R^2 , and beta weights on each cue. For physician subjects, the number of years in ambulatory practice was also examined in relation to beta weights, R^2 and mean judgments. For physician subjects, the only significant correlation was between number of adults in the home and mean judgment. These two variables showed an inverse relationship ($r=-.55, p=.001$) indicating that those physicians with more adults living in their home judged patients less likely to follow physicians' orders. This relationship was not found among patient subjects. However, three significant relationships could be demonstrated among the patient subjects. Age showed an inverse relationship with the beta weight for severity of illness ($r=-.36, p=.026$), and for the R^2 or amount of variation in judgment explained by the cues ($r=-.42, p=.01$). Thus, as age increased among the patient subjects, less importance was placed on severity of illness in judging the likelihood of following a medical regimen, and the amount of variation explained by the judgment decreased. The other relationship among patients was a positive relationship ($r=.35, p=.03$) between income and beta weight for support. This moderate correlation indicated that persons of higher income level tended to put greater importance on support than persons of lower income level. There was no significant relationship between level of income and the importance placed on cost ($r=.14, p=.23$).

Taking into account the number of subjects, lack of variation among subjects on the predictor and criteria variables, and the few moderate relationships noted, no basis was found to predict mean judgments,

importance placed on cues, or amount of variation in judgments explained by the cues.

Supplemental Analyses

Further analyses of data were carried out to examine the relation between subjective and objective weights, as well as descriptive data not directly related to the specific research questions.

The relation between subjective and objective weights is an important question in judgment theory. Objective weights are the beta weights statistically computed by multiple regression analysis of the judgments made by each subject on 27 cases. Subjective or self-reported weights were obtained by having subjects spread 100 points between the four cues to represent the importance subjects thought they placed on each cue when making the judgments. Analysis was done by replacing the beta weights with subjective weights in the regression equation, computing the judgments on the same 27 cases, and computing a Pearson correlation between the judgments computed with subjective weights and the actual judgments made. This R was squared (R_S^2) and subtracted from the R_O^2 obtained from the regression analysis. The mean difference score ($R_O^2 - R_S^2$) for patients was .14 with a standard deviation of .15, and for physicians, the mean difference score was .32, with a standard deviation of .17. These data are displayed in Table 4.10. An independent t test was done to test the mean difference scores for physicians and patients using the following hypotheses:

$$H_0 \quad \mu_1 - \mu_2 = 0$$

$$H_1 \quad \mu_1 - \mu_2 \neq 0$$

The variances were tested for equality and found equal ($F=1.32, p=4.58$) and pooled variance estimate was used to test for significance. With 58

degrees of freedom, and a t value of -4.25, the test was significant at p less than .0001. Therefore, the null hypothesis was rejected and there was a significant difference between physicians and patients on the computed difference scores between subjective and objective weights. The larger difference score for physicians can be examined by looking at Table 4.10. The physicians averaged a higher squared correlation between objective weights and actual judgments, compared with patients. However, physicians had a lower averaged squared correlation between subjective weights and actual judgments than patients. Therefore, the physicians had a greater difference score than patients.

Table 4.10
Squared Correlations Between Actual Judgments and Predicted
Judgments Using Subjective and Objective Weights Comparing
Physicians and Patients

	Patients	Physicians
R_O^2		
Mean	.53	.68
S.D.	.24	.12
R_S^2		
Mean	.41	.37
S.D.	.26	.19
Diff. Score		
Mean	.14	.32
S.D.	.15	.17

Subjects were also asked if they used information other than the four cues in judging the likelihood of a patient's adhering to a prescribed regimen. As discussed in chapters one and two, this study was based on an adaptation of Brunswik's Lens Model. In order to use this model, cues were identified thought to be in the major factors in explaining the variance in judgments of the likelihood that a patient will

carry out a prescribed regimen. The researcher identified these cues based on interviews, a review of literature, a pilot study and clinical experience. In an attempt to understand what other factors subjects in this study thought were important in making the judgments, all subjects were asked if they used other important kinds of information when thinking about the likelihood of a patient's adhering to medical orders. The results can be seen in Table 4.11. Of the 60 subjects, 63% responded that they did use other information in making the judgments, and 37% responded that they did not. The R^2 obtained from the regression analysis was examined for subjects who indicated they used other information in making the judgments, and those who indicated they did not use other information. Those who reported using other information had a mean R^2 of .59, with a standard deviation of .21. Those who reported not using other information had a mean R^2 of .64, with a standard deviation of .20. Thus, subjects who reported using only the four cues in making the judgments regarding patients' adhering to a medical regimen had 64% of the variance in their judgments explained by the four cues. Subjects who reported using information other than the four cues had 59% of the variance in their judgments explained by the four cues.

Table 4.11
Number of Patients and Physicians Using Information
Other than Four Cues in Making Judgments

	Number Indicating Use of Other Information		Number Indicating No Use of Other Information	
Physicians	22	73%	8	27%
Patients	16	53%	14	47%
Total	38	63%	22	37%

Other data were collected to get a broader understanding of the subjects in the study, and the context in which they were making judgments. All patient subjects were asked if they thought physicians would place the same importance they as patients did on the four cues convenience, cost, severity, and support when judging patients' adherence to a treatment plan. Of the 30 patients, 4 (13.3%) stated the physicians would place the same importance on the cues as they did, and 26 (86.7%) stated the physicians would not place the same importance as they did on the cues. There was a low correlation between the weights patients predicted physicians used in making the judgments and the actual beta weights obtained from analysis of the physicians' actual judgments ($r=.16$). The 26 patients who stated the physicians would place different weights on the cues were asked to spread 100 points over the four cues as they would expect physicians to weight the cues. Table 4.12 shows the weights patients predicted physicians would assign to the cues. Severity was predicted by patients to be most heavily weighted by physicians (63.8), convenience and cost predicted to receive only 13-14% of the total weight, and support predicted to receive the lowest weight (8.6) from physicians.

All subjects were asked to rate their own health and estimate the number of times they had sought health care from a physician in the past two years (see Table 4.13). There was no relationship found between health status, number of visits to a physician, and beta weights, mean judgments, or R^2 .

All subjects were also asked to rate their level of satisfaction with medical care. Across all subjects, a correlation of $r=-.40$, $p=.02$ was found between the level of satisfaction with medical care and the beta weight on support. Therefore, individuals who were less satisfied with medical care put more weight on support, and those more satisfied with

Table 4.12

Weights as Patients' Predicted Physicians Would Place
on Four Cues: Means, Standard Deviation, Range and Medians

Cue	Mean	S.D.	Lowest-Highest	Median
Convenience	14.4	14	0-50	10
Cost	13.8	10.5	0-40	12
Severity	63.8	24.5	20-100	60
Support	8.6	8.3	0-30	7.1

Table 4.13

Satisfaction with Medical Care and Frequency of Following
Physicians Orders: Ratings Across All Subjects

Scale	Satisfaction With Medical Care		Scale	Predicted Frequency of Following Medical Treatment	
	N	%		N	%
Extremely Satisfied	10	17.9	All of the Time	7	15.2
Very Satisfied	24	42.9	Most of the Time	28	60.9
Satisfied	18	32.1	Some of the Time	10	21.7
Not Very Satisfied	4	7.1	Never	1	2.2
Extremely Unsatisfied	0	0			

medical care put less weight on support. Satisfaction with medical care was not found related to other beta weights or mean judgments. Among patient subjects, however, satisfaction of medical care was correlated ($r=.40$, $p=.014$) with R^2 indicating that the more satisfied the patient was with the medical care received, the more variation accounted for in the judgments of likelihood of adhering to a prescribed regimen using the four cues in this study. However, this finding was not present in physicians.

Among physician subjects, a correlation of $r=.40$, $p=.039$ was found between physicians' stated satisfaction with medical care they had received and their level of their own adherence to a prescribed regimen. Thus, physicians said they would carry out a treatment plan to a greater extent when they were satisfied with medical care. No significant relationship was found between these two variables with patient subjects.

Finally, physician subjects were asked if they had any educational experience related to compliance. Exactly 50% of the 30 physicians did have educational experiences related to compliance, but no relation was found between educational experience, R^2 , mean judgments or beta weights.

Discussion

The results of this study are discussed within the framework of the research questions, and presented in five sections. These five sections are: (1) strength of association, (2) judgments, (3) cues, (4) demographic data, and (5) supplemental analyses.

Strength of Association. Strength of association was addressed by studying the squared correlation (R^2) between actual judgments and predicted judgments generated from beta weights. This squared correlation

was computed for each individual and indicated the amount of variation in that individual's judgments that was explained by a weighted linear combination of the cues. Averaging across patient subjects, the mean R^2 was .53 and the median was .58. Averaging across physician subjects, the mean R^2 was .68, and the median was .70. There was little difference between the average squared correlations of allopathic and osteopathic physicians.

In examining an individual's judgment policy, the R^2 indicates the predictability of the subject's response from the cues. To the extent that the judgments are predictable, the resulting regression equations are said to represent or "capture the policy" that the person used in making the judgment. This predictability measures the extent to which the subject controls the execution of his knowledge, or cognitive control. Cognitive control is statistically independent of the individual's knowledge (Hammond & Summers, 1972). Thus, subjects in this study may have full knowledge of the factors important in their judgments of whether to adhere to a medical regimen, but not use this knowledge accurately or consistently in making the judgments. The R^2 thus has a relation to the test-retest reliability coefficients. To the extent that a person is inconsistent in judgments, the predictability of the judgments is decreased and the R^2 is decreased.

Correlations between actual judgments and judgments generated from objective weights reported in the literature vary according to the task and subjects involved. Summers et al., (1970) asked 131 students to judge future socioeconomic growth of underdeveloped nations. They reported that the median R^2 was high at .57. Squared multiple correlations in judgments involving college admissions have generally been above .70 (Molidor, 1979; Cook and Stewart, 1975). Zedeck and

Kafry (1977) studied 67 nursing personnel given the task of evaluating 40 hypothetical behavioral descriptions of nurses. Among nursing personnel, the R^2 averaged approximately .65.

Physicians in this study were comparable to other studies reviewed, with a median of 70% of their judgments explained. However, patients demonstrated a wide range in the variation explained in their judgments. Three patients had no variation in their judgments, always marking the highest point on the scale, and one other patient marked the highest point on the scale for 26 of the 27 cases. This response was also noted in the pilot study for this research (Rothert, 1978). The basis for this response in patients may be a function of the instrument or a function of the individual. The subjects making identical responses to all measures were male and female, young and old. These subjects were interviewed by the researcher after completion of the instrument. Several of them indicated "obedient" characteristics, and appeared to be accurately reflecting the likelihood of following a prescribed regimen. Others verbalized situations in which they would not follow physicians' recommendations, but consistently marked the highest point on the scale. No clear explanation could be found for this behavior, although it may be related to patients' considering what they "should" do instead of what they "would" do. The way the question was asked, the presence of the researcher, or the information presented in the instrument could all be related to the lack of variation. Data collected on these subjects was not useful in understanding factors related to their judgments. However, it should be recognized that some patients may not weight information to make a judgment, but rather always do what the physician recommends. To that extent, this finding was useful in better understanding patients' judgments.

The R^2 was used in this study to judge the degree to which the findings were of practical importance.

The task in this study was not as familiar to the subjects as tasks such as admission judgments are to admissions committee members. The task is more familiar to physicians since they are called upon to prescribe treatment programs and consider which ones the patient is likely to carry out. Therefore, their higher R^2 is not unexpected. However, neither physicians or patients commonly make explicit specific factors considered nor make a scaled judgment. Further, the repeated measures and cues presented without a background situation made the task less realistic for subjects. Explaining 70% of physicians' judgments is useful in understanding their judgments and adequate to address the findings as being of practical importance. Patients demonstrated a wide range in the variance explained in their judgments. With a median of 58% of variance explained, it can be said that the data are useful in understanding judgments of patients, but findings must be interpreted taking into account that 42% of the variance in patient judgments is not explained.

Judgments. Patients in this study averaged judgments of 4.13 on a 5-point scale, indicating that they probably would carry out all of the treatment plan. Physicians' judgments averaged 2.99 on the 5-point scale, slightly short of saying patients "may or may not" carry out all of the treatment plan. Thus, patients were inclined to think that they may carry out the treatment plan, and physicians were inclined to think that patients may not. The patients in this study were taken from the pool of patients seen by the physician subjects. Therefore, it appears that physicians and patients have different expectations of the treatment program being followed.

Several explanations of this difference may be offered. The literature suggests that patients do not follow a prescribed medical regimen (Cohen, 1979; Sackett and Snow, 1979). Therefore, the findings in this study conflict with the findings in the literature. However, this research was not a study of the behavior of patients but of judgments of the likelihood of the behavior occurring. Patients may have good intentions which change when the actual situation occurs. The patients in this study had never been diagnosed as having hypertension, but many expressed very strong feelings about hypertension. Some patients perceived hypertension as a life-threatening situation, and thus viewed the treatment plan as necessary for life. Many reflected upon and appeared influenced by experiences of relatives or friends who had hypertension. Hypertension is primarily an asymptomatic condition, so patients usually do not experience physical discomfort. Thus, hypertensive patients and patient subjects in this study did not systematically differ in physical complaints.

The patients' inclination to think they would carry out the prescribed regimen may be a function of the artificial situation presented by hypothetical cases. Therefore, the results may not accurately reflect judgments made in real-life situations. However, it is also possible that patients, when first hearing of the treatment program, fully intend to carry it out. If, at that point, patients do intend to carry out the treatment program, the findings of this study do accurately reflect the real-life situation.

Physicians have been shown to substantially over-estimate compliance of their own patients (Sackett and Haynes, 1976; Caron and Roth, 1968; Gordis, 1979). Therefore, the findings in this study contrast with

the findings in literature. This discrepancy may be attributed to use of hypothetical situations. Physicians expressed difficulty with cases presented without association with an individual patient. The findings could also be attributed to the physician subjects used in this study. All physicians held faculty appointments and practiced in a setting with medical students, although many also had community based practices. It may be that these physicians were more familiar with current medical literature reviewing compliance. If this is so, this study accurately reflected their judgment policy, but would have limited generalizability to non faculty physicians. It may also be that these physicians were familiar with the literature and trying to respond to the instrument reflecting this knowledge. If the knowledge was not integrated into their judgment policy, the findings would not be an accurate reflection of their judgment policy.

The difference between physicians' and patients' judgments might be best explained by looking at the situation surrounding a physician and patient when a medical treatment is prescribed. A patient has been given the diagnosis of hypertension, been told the risks to health involved, and received information about a treatment program that should improve the physical condition. At that point, a patient can talk about cost, support, convenience, and severity in general terms, but has not experienced the impact of trying to carry out the treatment plan. Given the risks to health and a way to improve one's health, it may seem most logical to try to carry out the medical treatment. A physician, however, has treated many hypertensive patients and been told by patients of the difficulties of carrying out a plan of treatment. A physician has seen patients' not responding to a treatment program, and known or suspected the treatment program had not been carried out. A physician in this

situation may be inclined to judge that a patient would not carry out all of a treatment program for an indefinite period of time. This explanation of the findings would mean that the data accurately reflected the judgments of physicians and patients at the point that treatment is prescribed, and that very real differences do exist in their judgments.

Cues. In the previous section, findings addressing physicians' and patients' use of cues in making judgments were presented based primarily on a complex analysis using a multivariate analysis of variance for repeated measures procedure by Jeremy Finn, modified for a $1/3 \ 3^4$ fractional factorial design. At first glance, it might appear desirable to have used a less complex analysis that would have yielded straight forward tests of significance between cues and groups. Findings would have led to clear conclusions within the limitations of the sample studied and the measures used. However, the purpose of this study was to better understand physicians' and patients' judgments regarding adherence to a medical regimen. Conclusions based on significant or less than significant main effects would be helpful only to the extent that the judgments of physicians and patients were a simple weighting of individual cues. Since interactions could not have been tested, they would not have been found, and therefore, assumed not to exist. Although this analysis, in its complexity, has not provided simple conclusions, it is suggested that the situation may not contain simple relationships, and an analysis that identifies the complexity in the situation may be most useful in approaching reality.

The results suggested both patients and physicians used an interaction of the cues in making the judgments, rather than responding to each cue alone. In the design used for this study, there is no way to

separate the interactions from the main effects when the interactions are significant. Therefore, the use of each cue by physicians and patients may well be an interaction effect between levels of several cues, and this must be taken into account when interpreting the results. By visual displays of the data and multiple analyses it was indicated that physicians and patients used the cues cost, convenience and severity in a similar way, and physicians placed greater importance on the cue support than patients.

Support was defined in this study as the amount and type of helpfulness and encouragement provided to the patient by those people who are important to the patient. This might include those with whom the patient lives, those with whom the patient works, and other friends and associates whose relationship the patient values and whom the patient sees frequently. The review of literature regarding support was not conclusive, but was suggestive that support of family and friends was associated with compliance.

Support has not been well defined in many studies (Caplan, 1979), and has been frequently studied in specific contexts. While the literature demonstrates support for use of the cues in the judgment, there is little evidence to help interpret why physicians place greater importance on support than patients when thinking about the likelihood that a patient will carry out a treatment program.

Possible explanations may be found by examining the subjects used in the study. Of the 30 physician subjects, 20 were family practitioners. Family practitioners serve family units, and it is reasonable to assume that their training and focus of care emphasizes the influence of family support on a patient's behavior. Further, recent literature (Becker, 1979) has suggested the effect of family and other support systems on the patient's

adherence to a medical regimen is likely to be of tremendous importance. As previously discussed, these faculty physicians may be reflecting knowledge of current literature which may or may not be a part of their judgment policy.

Patients made frequent comments about the cue "support" which may help in understanding their use of the cue. The most frequent comment was that support and encouragement were nice, but it was their own body, and they were the ones who must take responsibility for decisions involving their health. Patients tended to perceive themselves as independently functioning individuals. If they were dependent, they denied it in the comments made to the researcher.

It is important to remember in interpreting these results, that support cannot be separated from an interaction with other cues. It is interesting to note that Kasl (1975) suggested that if there was an association between support and compliance, it was in ways which represented interaction with other variables. Both physicians and patients used a complex interaction of the cues to make judgments of patient adherence. Less complex analyses were usually carried out in other judgment studies, and thus the literature is not useful in interpreting these results. The same triple interactions (cost, support, convenience) were highly significant with patients and with physicians. Overall significance of all interactions was greater with physicians than with patients, however, perhaps reflecting the education of physicians in using a more complex combination of information to make a judgment. It is apparent that the judgment of the likelihood that a patient will carry out a prescribed treatment program is a complex judgment for both physicians and patients.

Relation of Demographic Data to Judgments, Use of Cues and R^2 .

Analysis of demographic data did not provide a basis from which to predict mean judgment, importance placed on cues, or amount of variation in judgments explained by the cues. The relatively small number of subjects and lack of variation among subjects on the predictor and criteria variables did not support the likelihood that predictable relationships would be identified. Further, studies in the literature consistently have found no association between demographic variables and compliance (Marston, 1970; Hulka et al., 1975; Haynes, 1976a, 1976b).

In analyzing the data, there were several relationships which merit brief discussion. For physician subjects, it was found that those physicians with more adults living in their home judged patients less likely to follow physicians' orders ($r = -.55, p = .0001$). While there is no known explanation of this finding in the literature, it seems possible that physicians living with other adults may be more familiar with the difficulty people experience in carrying out physicians' orders. They may see the adults they live with modify or reject a physician's recommendations, perhaps even their own recommendations.

Three significant relationships were identified among patient subjects, although the relationships were at most moderate. Age showed an inverse relationship with the beta weight for severity of illness ($r = -.36, p = .026$) and for the R^2 or amount of variation in judgment explained by the cues ($r = -.42, p = .01$). Thus, as age increased among the patient subjects, less importance was placed on severity of illness. This might be a function of how patients viewed hypertension in this study. Older people are more likely to have experienced chronic disease in themselves or with their peers, and thus may be less likely to place major importance on severity.

As age increased, less variation in judgment was explained by the linear combination of cues. This could be due to the complexity of the task and difficulty in consistently weighting the four cues. An alternative explanation would be that the elderly used information outside the design of the study in making their judgments.

The third relationship found significant was a positive relationship between income and beta weight for support. Thus, persons of higher income level tended to put greater importance on support than persons of lower income level ($r=.35$, $p .03$). There appears to be no obvious explanation for this finding.

In summary, although a few moderate relationships were noted, no basis was found upon which to predict mean judgments, beta weights or R^2 on the basis of demographic data.

Supplemental Analyses. Further analyses of data were carried out to examine the relation between subjective and objective weights, as well as descriptive data not directly related to the specific research questions.

The relation between subjective and objective weights is an important theoretical and practical question. Objective weights were the beta weights statistically computed by multiple regression analysis of the judgments made by each subject on 27 cases. Subjective of self-reported weights were obtained by having subjects spread 100 points between the four cues to represent the importance subjects thought they placed on each cue when making the judgments. Studies comparing subjective and objective weights are relatively few. In most of the studies, subjective weights were simply compared with statistical weights. Three studies that compared actual and predicted judgments based on objective and subjective weights

were Summers et al., (197), Cook and Stewart (1975), and Molitor, 1979. Cook and Stewart (1975) compared seven different methods of collecting subjective weights. Their results indicated no significant differences among methods of collecting subjective weights. Further, they found the variance accounted for by the subjective policies was nearly equal to the objective descriptions of the cue importance. Summers et al., (1970) studied a four cue judgment task with undergraduate university students and found the median correlation between actual and predicted judgments based on subjective weights to be .60, and the median multiple correlation based on objective weights to be .75. Molitor (1979) found subjective weights to be a valid measure to model a medical school admissions judgment task. Thus, the findings are mixed with Summers et al., finding subjective policies deficient and Cook and Stewart and Molitor finding them comparable.

In this study, subjective policies were substantially less than policies computed with statistical weights for both physicians and patients (See Table 4.10). Patients averaged 53% of the policy captured by computation using statistical weights, and 41% by subjective weights, with a mean difference of 14%. Physicians averaged 68% of their judgment policy accounted for by statistical weights, but only 37% explained by subjective weights, making a mean difference of 32%. The difference score between physicians and patients was statistically significant at the p less than .0001 level.

These findings indicate that self reported subjective weighting is less useful than statistical weighting in explaining physicians' and patients' policy in this judgment. The large difference found between physicians' policy explained by objective weighting and subjective weighting may be better understood by looking at the task. Patients actual

judgments were based on self prediction of the likelihood that they would carry out the treatment plan, and the subjective weights were then self reports of how they used the cues in making the judgments. Physicians made judgments about the likelihood that patients would carry out the treatment plan, which involved thinking of the importance patients were placing on the cues. Physicians were then asked to spread 100 points over the cues as they themselves used them in making the judgments. It may be that the shift in focus from patient to self accounted for some of the difference in judgment policy explained by subjective and objective weights.

Another explanation can be found by studying the familiarity of the task. Physicians are more familiar with the task, trained to make judgments, and thus their R^2 was greater than patients, as previously discussed. However, physicians may have been making these judgments without using a rule, and thus found it difficult to make their policy explicit. Patients were confronted with a relatively new task and were aware that this was a new task. It is likely that they formulated a rule in responding to the cases, and therefore were more likely to know what rule they were using. The newness of the task leading patients to formulate a rule may account for some of the difference in judgment policy explained by subjective and objective weights for physicians and patients.

Subjects' use of other information was also examined. As presented in Table 4.11, 73% of the physicians and 53% of the patients indicated other information was important to them in judging the likelihood that the patient will carry out a treatment regimen. Subjects who reported using other information in the judgments had 5% less variance explained by a linear combination of the four cues in this study. The literature has

indicated that subjects use fewer cues in making their judgments than they report using (Slovic & Lichtenstein, 1974). The finding was substantiated in this study as subjects' subjective weights were more equally distributed than their objective weights, which were primarily distributed over three of the four cues. Together with the finding that only 5% more variation in the judgments was accounted for by those reporting use of only the four cues than those reporting use of other information, a question arises as to whether subjects, in fact, were using other information to the extent reported.

Factors other than the four cues identified by subjects as useful in making the judgments were also examined as potential cues that would make a contribution to the explained variation in judgment. Patients most frequently mentioned physician-patient relationship as an additional variable. Physician-patient relationship is not a cognitive factor that could serve as a cue in this study, although it is hoped this study will contribute knowledge in the area of improving the physician-patient relationship.

Physicians had a wider range of topics reported as contributing to the judgment, most of which were very generally defined and used by only a few physicians. This finding may be consistent with the studies indicating physicians are not accurate predictors of patient compliance (Sackett & Haynes, 1976). The most frequently mentioned factor was patients' level of education and intelligence, which has been shown in the literature not to be a factor related to compliance (Marston, 1979; Hulka et al., 1975; Haynes, 1976). Physician-patient relationship was mentioned by five physicians as important. Overall, most of the additional factors mentioned were either noted in the literature as not being related to compliance or defined in terms that would be difficult to translate

into a cue expected to make a significant contribution to an explanation of this judgment.

Other data were examined to better understand the subjects in the study and the context in which they were making the judgments. Of the 30 patient subjects, 86.7% reported physicians would not place the same importance as they did on the cues. When asked to spread 100 points over the four cues as they would expect physicians to weight the cues, they predicted severity to be most heavily weighted and support to receive the lowest weight. Comparison with beta weights shows that severity was the one cue receiving greater weight by patients than physicians. Again, this response by physician subjects may reflect their knowledge of the literature and their attempt to display that knowledge in their responses. Patients strong and consistent declaration that physician would put primary emphasis on severity of illness may reflect the patients' sensitivity to the medical model which is disease oriented. Severity of illness is the one cue with no personal association, and patients may be expressing a feeling of being considered as a disease rather than an individual. The other three cues (convenience, cost, and support) were predicted as being weighted by physicians approximately 50% lower than severity.

Several other moderate relationships were noted between subject characteristics and mean judgments, R^2 and beta weights. The most interesting relationship to this researcher was the correlation between satisfaction with medical care and R^2 ($r=.40$, $p=.014$). The more satisfied the patient was with the medical care received, the more variation accounted for in the judgments. While only a moderate relationship, this finding may be consistent with the patient's report that

physician-patient relationship was the most important "other" piece of information used in the judgments. The instrument did not give information about the physician-patient relationship. Therefore, it may be that those patients satisfied with care could comfortably use the four cues consistently in making judgments, and those not satisfied with medical care would consider the physician-patient relationship as a factor in some cases.

Across all subjects, a correlation of $r = -.40$, $p = .02$ was found between level of satisfaction and beta weight on support. Individuals who were less satisfied with medical care put more weight on support, and those more satisfied with medical care put less weight on support. It is possible that those less satisfied with medical care seek and rely on others for advice and support due to lack of confidence in the medical care received. Those satisfied with the medical care may not feel as great a need to validate physician's recommendations with family and friends. This finding may be related to the relation between physicians' satisfaction with medical care they had received and their level of adherence to prescribed regimen ($r = .40$, $p = .034$). Physicians may not feel the need to seek other opinions so perhaps would not look to support, but seem to also be saying that they need to be satisfied with medical care before following a physician's recommendations.

Summary

This chapter presented and discussed descriptive and statistical analyses of the data to better understand physicians' and patients' judgments of the likelihood that a patient will carry out a treatment program.

Strength of linear association between independent and dependent variables was examined first to determine the usefulness of the data and to correctly interpret the analyses. A multiple regression analysis was done on data from each of the 60 subjects across the 27 cases. The correlation between each subject's actual judgments and judgments generated from objective weights were squared, and these squared correlations or R^2 indicated the amount of variance that was explained in each subject's judgments. Patients had a median R^2 of .58 and physicians had a median R^2 of .70. There was little difference between the allopathic and osteopathic physicians.

Over 60 subjects, an average of 66% of the variance in judgments was accounted for by a linear combination of the four cues in this study. The variance accounted for in physicians' judgments was comparable to that found in studies of judgment reviewed in the literature. However, patients demonstrated a wide range in the variation explained in their judgments. Three patients had no variation in their judgments, always marking the highest point on the scale, and one other patient marked the highest point on the scale for 26 of 27 cases. The basis for this response in patients may be a function of the instrument or a function of the individual. Data collected on those subjects was not useful in understanding factors related to their judgments. However, it should be recognized that some patients may not weight information to make a judgment, but rather always do what the physician recommends. To that extent, this finding was useful in better understanding patients' judgments. Overall, explaining 70% of physicians' judgments is useful in understanding their judgments and adequate to address the findings as being of practical importance. Patients demonstrated a wide range in the variance explained in their judgments. With a median of 58% of variance explained, it can be said that the data is useful in understanding judgments of patients, but findings must be interpreted taking into account

that 42% of the variance in patient judgments is not explained.

Each subject made a judgment of the likelihood of a patient's adhering to a treatment plan on 27 cases. The grand mean judgment across the 30 patient subjects was 4.13 on a 5-point scale. Thus, patients were inclined to judge that they would follow the physicians' orders. The grand mean judgment across 30 physician subjects was 2.99 on a 5-point scale, indicating that physicians were inclined to judge that patients may not carry out the treatment program. A univariate analysis of variance test indicated highly significant (p less than .0001) differences between the judgments of physicians and patients over the 27 cases. The literature suggests that many patients do not follow a prescribed medical regimen. Thus, the findings in this study conflict with the findings in the literature, although this research was not a study of the behavior of patients. Previous studies have also demonstrated that physicians substantially over-estimate compliance of their own patients. The findings in this study therefore again contrast with the findings in the literature. A possible explanation for the results might be found in the situation surrounding a physician and patient when a medical treatment is prescribed. After receiving the diagnosis and appropriate information regarding the treatment program, a patient can talk about cost, support, convenience, and severity in general terms, but has not experienced the impact of trying to carry out the treatment plan. A patient may feel very positive about adhering to the treatment at this point. A physician may have treated many hypertensive patients and frequently known or suspected the treatment program had not been carried out. At this point a physician might believe that most patients may not carry out the treatment program. This explanation of the findings would mean that the data accurately reflected the judgments

of physicians and patients at the point that treatment is prescribed, and that significant differences do exist in their judgments.

Use of cues by physicians and patients was analyzed by multiple regression and multivariate analysis of variance for repeated measures. The regression analysis indicated that patients and physicians demonstrated a similar pattern in the use of cues cost, convenience and severity. Physicians placed substantially greater importance on the cue support. The order by weight assigned to cues by physicians was support .52, severity .37, convenience .34, and cost-.16. For patients, order of cues by weight was severity .42, support .24, convenience, .19, and cost -.05.

Interpretation of results of the multivariate analysis of variance must be carefully made taking into account the design of the study. The multivariate test did indicate that patients and physicians were using the cues differently (p less than .0001). More specific analysis of how physicians and patients used the cues was interpreted with caution since the design of the study was a 1/3 replicate of a 3^4 fractional factorial and full interpretation of main effects can only be accomplished when interactions are assumed negligible. The multivariate analysis of variance test for interaction of cues with groups was only marginally significant ($p=.0197$). Multivariate analysis of variance of the profile of cues for physicians as a separate group indicated a significant interaction effect (p less than .0001) while the same analysis for patients was not significant (p less than .5694). Further examination revealed a high correlation between significant and nonsignificant tests for cue interactions in the univariate analysis for physicians and patients. The six ABC interactions (A=cost; B=support; C=convenience) were all significant, after partitioning the alpha and using p less than .0002. Further, the multivariate analysis of variance test for group by triple interaction of cues was found not

significant at p less than .0222, and in tests of the separate groups, physicians were using the ABC interaction at p less than .0001 levels of significance, and patients were using the interactions at p less than .0003 level of significance. Thus, both physicians and patients were using the ABC interactions at a significant level in making their judgments, and there was not a significant difference in how patients and physicians were using the interactions. There is no way to separate the interactions from the main effects when the interactions are significant. However, visual display of the data and multiple analyses have suggested in this study that physicians and patients used the cues cost, convenience and severity in a similar way, and physicians responded to a greater extent than patients to the cue support. Further, these results strongly suggest both patients and physicians used an interaction of the cues in making the judgments rather than responding to each cue alone.

In explaining the results of the analyses used in this study, it was suggested that although this analysis, in its complexity, has not provided simple conclusions, the situation may not contain simple relationships. The purpose of this study was to better understand physicians' and patients' judgments regarding adherence to a medical regimen, and an analysis that identified the complexity in the situation may be most useful in understanding reality.

Explanation for the difference between physicians and patients in use of support may be found by examining the subjects used in the study. Of the 30 physician subjects, 20 were family practitioners. It is reasonable to assume that their training and focus of care emphasizes the influence of family support on a patient's behavior, and therefore provides an explanation for the emphasis on the cue support. Patients, however, made comments to the researcher which indicated that they tended

to perceive themselves as independently functioning individuals, and while support and encouragement were nice, they needed to take responsibility for decisions regarding their health. It must be recalled in interpreting these results that support cannot be separated from interaction with other cues. It can be said that the judgment of the likelihood that a patient will carry out a prescribed treatment program is a complex judgment for both physician and patient.

Further analyses were carried out to determine if demographic data could be used to predict judgments, use of cues and R^2 . Taking into account the number of subjects and lack of variation among subjects on the predictor and criteria variables, a few moderate relationships were noted but no basis was found for making predictions.

Analysis of data to examine the relation between subjective and objective weights as well as descriptive data not directly related to specific research questions was carried out. In examining subjective and objective weights, physicians averaged a higher squared correlation between objective weights and actual judgments (.68) compared with patients (.53). However, physicians had a lower average squared correlation between subjective weights and actual judgments (.37) than patients (.41). Therefore, the physicians had a greater difference score (.32) than patients (.14) and this difference was significant at p less than .0001. A possible explanation offered was that physicians made their judgments based on how they thought patients used the cues, and were then asked to report how they themselves were using the weights in making the judgments about patients. It may be that the shift in focus from patients to self accounted for some of the difference in judgment policy explained by subjective and objective weights. Also, it is possible that physicians are more familiar with the task, but not

accustomed to knowing the rule they use in making judgments. Patients may have found the task new, and worked to develop a rule in responding to the cases. Having developed a new rule may have made it easier for patient subjects to accurately identify their subjective weights.

Subjects were asked if they used other information in making the judgments. Analysis showed 73% of the physicians and 53% of the patients indicated other information was important to them. Patients primarily mentioned physician-patient relationship as an additional factor, while physicians had a wide range of topics with patient's education mentioned most frequently. Overall, most of the additional factors mentioned were either noted in the literature as not being related to compliance, or defined in terms that would be difficult to translate into a cue expected to make a significant contribution to an explanation of this judgment.

Finally, patient subjects were asked to predict if physicians weighted cues the same as they did. Of the 30 subjects, 86.7% reported physicians would not place the same importance as they did on the cues, predicting severity to be the most heavily weighted by physicians and support to receive the lowest weight. Comparison with beta weights shows that severity was the one cue receiving greater weight by patients than physicians, and support received much greater weight by physicians than patients. Patients' strong and consistent prediction that physicians would put primary emphasis on severity of illness may reflect the patients' sensitivity to the medical model and a feeling of being considered as a disease rather than as an individual.

CHAPTER V
SUMMARY AND CONCLUSIONS

CHAPTER V

SUMMARY AND CONCLUSIONS

This chapter is organized into the following five sections:

(1) summary of the study and its findings; (2) limitations of the study; (3) conclusions; (4) implications of the study; and (5) recommendations for future research.

Summary

A current problem facing our health care delivery system is the lack of patient adherence to prescribed medical regimens. Mutual understanding or concordance between physicians and patients is likely to positively influence patient adherence to medical treatment. Patients are more likely to carry out a treatment program if they perceive they share with their physicians common understandings of the medical regimen. Better understanding of the perceptions of physicians and patients as they strive toward concordance may increase the knowledge of how patient education can positively influence health promoting behavior. Recognizing the problem of lack of patient adherence to prescribed medical regimens and the importance of physician-patient concordance in improving adherence, this study responded to the need for research examining both physicians' and patients' perspectives on patient adherence to a medical regimen. The purpose of this study was to compare how physicians and patients use information to judge the likelihood that a patient will carry out a prescribed medical regimen. Physician-patient negotiation and mutual decision-making is recognized as a means of increasing physician-patient

concordance. In striving toward concordance, it is important to know whether physicians and patients share a common understanding of the factors that influence their judgments. This study used Brunswik's lens model as adapted by Hammond as a basis for studying how physicians and patients use information provided to them to make judgments regarding the likelihood of a patient's carrying out a prescribed regimen.

In order to use the lens model, cues were identified that were thought to be important factors perceived and used by physicians and patients in making the judgments. The cues identified as being used by physicians and patients in judging the likelihood of a patient carrying out a physicians' recommendations were convenience, cost, severity of illness and support. Using these four cues, an instrument was developed and field tested to compare the judgments of physicians and patients and the importance physicians and patients placed on each of the four cues in making their judgments. Hypertension was the disease entity presented in the instrument.

Subjects for the study were recruited from an ambulatory care center located at Michigan State University. Of the 30 physicians participating in the study, 16 were allopathic physicians (M.D.) and 14 were osteopathic physicians (D.O.).

This study had four independent variables (cues) with three levels of each. Judgments were made by subjects on 27 cases. Each case described a level of each of the cues. The dependent variable was a judgment made on a 5-point scale. This was a comparative study, with two groups of 30 subjects each (physicians and patients). A full 3^4 design (81 cases) would not have been feasible for subjects to complete. Therefore, a $1/3$ replicate of a 3^4 fractional factorial design was used with 27 unique cases. Content validity for the instruments was judged satisfactory

by a panel of five experts in judgment theory. Test-retest reliability was examined by replicating five randomly selected cases. Across the total group, the r_{xx} was considered adequate at .74, although physicians' mean r_{xx} was .41 compared with patients' mean r_{xx} of .77. It was noted that the restricted range of physician judgments should be considered as a factor in the lower reliability coefficient for physicians.

Data were collected from 30 physicians and 30 patients and analyzed using Statistical Package for the Social Sciences (SPSS) multiple regression and Jeremy Finn multivariate procedures, as well as SPSS procedures for Pearson and Spearman correlations, and Chi square measure of association. The general research questions addressed in this study were:

1. To what extent can the variance in judgments of physicians and patients be accounted for regarding the likelihood that a patient will carry out a prescribed medical regimen as defined on the variables convenience, cost, severity of illness and support.
2. Is there a difference between judgments of physicians and patients regarding the likelihood that a patient will carry out a prescribed medical regimen?
3. Is there a difference between physicians and patients in the importance each attaches to convenience, cost, severity of illness and support in making a judgment as to the likelihood that a patient will carry out a prescribed medical regimen?

4. To what extent is demographic data useful in predicting judgments of physicians and patients, the importance attached to the four cues in making the judgments, and the amount of variation accounted for in making those judgments?

The variance in judgments accounted for by the four cues in the study was addressed first to determine the usefulness of the data and to correctly interpret the analyses. The strength of association was determined by examining the squared correlation between the best linear combination of the predictor variables and the actual judgments of each subject.

Over 60 subjects, an average of 66% of the variance in judgments was accounted for by a linear combination of the four cues in the study.

The median variance accounted for in physicians' judgments (.70) was comparable to that found in studies of judgment reviewed in the literature, and adequate to address the findings as being of practical importance.

However, patients demonstrated a wide range in the variation explained in their judgments with a median of .58. Three patients had no variation in their judgments, always marking the highest point on the scale and thus indicating that they would always carry out the physicians' recommendations. This finding was consistent with the pilot study and it is suggested that some patients may not weight information to make a judgment, but rather always do what the physician recommends. With a median of 58% of variance in judgments explained, it can be said that the data are useful in understanding judgments of patients, but findings must be interpreted taking into account that 42% of the variance in patient judgments is not explained.

Judgments were compared between the 30 physicians and 30 patients. Patients were inclined to judge that they would follow physicians' orders, with a mean judgment across the 30 patient subjects of 4.13 on

a 5-point scale. The mean judgment across 30 physician subjects was 2.99 on a 5-point scale, indicating that physicians were inclined to judge patients may or may not carry out a treatment program. A multivariate analysis of variance test indicated highly significant (p less than .0001) differences between the profile of means associated with the judgments of physicians and patients over the 27 cases. The literature suggests that many patients do not follow a prescribed medical regimen. Thus, the findings in this study conflict with the findings in the literature, although this research was not a study of the behavior of patients. Previous studies have also demonstrated that physicians substantially overestimate compliance of their own patients. The findings in this study therefore again conflict with the findings in the literature. Alternative explanations for the results included examining the situation surrounding a physician and patient when a medical treatment is prescribed. After receiving the diagnosis and appropriate information regarding the treatment program, a patient can talk about cost, support, convenience, and severity in general terms, but has not experienced the impact of trying to carry out the treatment plan. A patient may feel very positive about adhering to the treatment at this point. A physician may have treated many hypertensive patients and frequently known or suspected the treatment program had not been carried out. At this point, a physician might believe that most patients would not carry out the treatment program. This explanation of the findings would mean that the data accurately reflected judgments of physicians and patients at the point that treatment is prescribed, and that significant differences do exist in their judgments.

Use of cues by physicians and patients was analyzed by multiple regression and multivariate analysis of variance for repeated measures. The regression analysis indicated that patients and physicians demonstrated

a similar pattern in the use of cues cost, convenience and severity. Physicians place substantially greater importance on the cue support. The order by weight assigned to cues by physicians was support .52, severity .37, convenience .34, and cost -.16. For patients, the order of cues by weight was severity .42, support .24, convenience .19, and cost -.05.

Interpretation of results of the multivariate analysis of variance must be carefully made taking into account the design of the study. The multivariate test did indicate the patients and physicians were using the cues differently (p less than .0001). More specific analysis of how physicians and patients used the cues was interpreted with caution since the design of the study was a $1/3$ replicate of a 3^4 fractional factorial and full interpretation of main effects can only be accomplished when interactions are assumed negligible. The multivariate analysis of variance test for interaction among cues by groups was only marginally significant ($p=.0197$). Multivariate analysis of variance of the profile of cues for physicians as a separate group indicated a significant interaction effect (p less than .0001) while the same analysis for patients was not significant (p less than .5694). Further examination revealed a high correlation between significant and nonsignificant tests for cue interactions in the univariate analysis for physicians and patients. The six ABC interactions (A=cost; B=support; C=convenience) were all significant, after partitioning the alpha and using p less than .002. Further, the multivariate analysis of variance test for group by triple interaction of cues was found not significant at p less than .0222, and in tests of the separate groups, physicians were using the ABC interaction of p less than .0001 level of significance, and patients were using the interactions at p less than .0003 level of significance. Thus, both physicians and patients

were using the ABC interactions at a significant level in making their judgments, and there was not a significant difference in how patients and physicians were using the interactions.

There is no way to separate the interactions from the main effects when the interactions are significant. However, visual display of the data and multiple analyses have suggested in this study that physicians and patients used the cues cost, convenience and severity in a similar way, and physicians responded to a greater extent than patients to the cue support. Further, these results strongly suggest both patients and physicians used an interaction of the cues in making the judgments rather than responding to each cue alone.

In explaining the results of the analyses used in this study, it was suggested that although this analysis, in its complexity, has not provided simple conclusions, the situation may not contain simple conclusions. The purpose of this study was to better understand physicians' and patients' judgments regarding adherence to a medical regimen, and an analysis that identified the complexity in the situation may be most useful in understanding reality.

Explanations for the difference between physicians and patients in use of support may be found by examining the subjects used in the study. Of the 30 physician subjects, 20 were family practitioners. It is reasonable to assume that their training and focus of care emphasizes the influence of family support on a patient's behavior, and therefore provides an explanation for the emphasis on the cue support. Patients, however, made comments to the researcher which indicated that they tended to perceive themselves as independently functioning individuals, and while support and encouragement were nice, they needed to take responsibility for

decisions regarding their health. It must be recalled in interpreting these results that support cannot be separated from interaction with other cues. It can be said that the judgment of the likelihood that a patient will carry out a prescribed treatment program is a complex judgment for both physician and patient.

Further analyses were carried out to determine if demographic data could be used to predict judgments, use of cues and R^2 . Taking into account the number of subjects and lack of variation among subjects on the predictor and criteria variables, a few moderate relationships were noted but no basis was found for making predictions.

Analysis of data to examine the relation between subjective and objective weights as well as descriptive data not directly related to specific research questions was carried out. In examining subjective and objective weights, physicians averaged a higher squared correlation between judgments computed with objective weights and actual judgments (.68) compared with patients (.53). However, physicians had a lower average squared correlation between judgments computed with subjective weights and actual judgments (.37) than patients (.41). Therefore, the physicians had a greater difference score (.32) than patients (.14) and this difference was significant at p less than .0001. A possible explanation offered was that physicians made their judgments based on how they thought patients used the cues, and were then asked to report how they themselves were using the weights in making the judgments about patients. It may be that the shift in focus from patients to self accounted for some of the difference in judgment policy explained by subjective and objective weights.

Subjects were asked if they used other information in making the judgments. Analysis showed 73% of the physicians and 53% of the

patients indicated other information was important to them. Patients primarily mentioned physician-patient relationship as an additional factor, while physicians had a wide range of topics with patient's education mentioned most frequently. Overall, most of the additional factors mentioned were either noted in the literature as not being related to compliance, or defined in terms that would be difficult to translate into a cue expected to make a significant contribution to an explanation of this judgment.

Finally, patient subjects were asked to predict if physicians weighted cues the same as they did. Of the 30 subjects, 86.7% reported physicians would not place the same importance as they did on the cues, predicting severity to be the most heavily weighted by physicians and support to receive the lowest weight. Comparison with beta weights shows that severity was the one cue receiving greater weight by patients than physicians, and support received much greater weight by physicians than patients. Patients strong and consistent prediction that physicians would put primary emphasis on severity of illness may reflect the patients' sensitivity to the medical model and a feeling of being considered as a disease rather than as an individual.

Limitations of the Study

Understanding the limitations of the study is necessary for accurate interpretation and use of results. First, the generalizability of the study is limited to physicians and patients who are similar to the subjects tested. Patients were volunteers, recruited by health care staff during their visits to the Clinical Center. The staff was told that subjects must be adults who had never been diagnosed as having hypertension. Factors that influenced which patients the staff approached

about the study were not controlled.

All subjects were non-paid volunteers. Therefore, there is a risk of self-selection biasing the results. Physicians were volunteers from four departments in the Clinical Center, and all held faculty appointments. Faculty physicians may not represent community based physicians in their judgments. Further, those physicians who volunteered may not share an identical perspective of health care with those who did not volunteer. However, a high percentage of eligible physicians participated in this study. The use of both allopathic and osteopathic physicians does broaden the generalizability of the study within the limitations mentioned.

The disease entity presented in this study was hypertension. Judgments made related to a treatment program for hypertension may not be the same as judgments made related to a treatment program for other diseases. The patient subjects used were patients who were not hypertensive. However, patients expressed strong views of hypertension, cause and risk to health. Patients experiencing hypertension or a different group of subjects might make different judgments based on their views of and experiences with hypertension. The stimulus materials used in this study were hypothetical cases, and may not give an accurate picture of judgments made in real-life. Also, the cases in this study were designed around four cues or independent variables. Other cues may influence the judgment, as discussed in Chapter 4. Changing the number or type of variables in the study might change the results.

Finally, this study relied on multiple regression and multivariate analysis of variance to analyze the judgments. Other techniques could have been used such as computer simulation, decision trees, or thinking aloud protocols. Additional techniques used to examine physicians'

and patients' judgments could produce a broader understanding of the judgments.

Conclusions

Within the limitations of these data, the following conclusions were drawn:

1. Approximately 60% of variation in judgments of physicians and patients regarding the likelihood that a patient will carry out a treatment plan was explained by a linear combination of the cues convenience, cost, severity, and support.
2. Patients were inclined to judge that they probably would carry out a treatment plan.
3. Physicians were inclined to judge that patients may or may not carry out a treatment plan.
4. Physicians and patients demonstrated a similar pattern in the use of cues convenience, cost, and severity. Physicians placed greater importance on the cue support.
5. Physicians and patients made judgments of the likelihood of a patient's adhering to a medical regimen using a complex combination of the cues cost, support, convenience, and severity of illness.
6. Self-reported subjective weighting was less useful than statistical weighting in explaining physicians' and patients' policy in judging the likelihood of a patient's adhering to a medical regimen.

7. Patients perceived physicians' weighting of the cues as not congruent with patients' own policy. Specifically, patients thought physicians placed primary importance on the cue severity, and little importance on the other three cues when judging the likelihood that a patient would carry out a treatment plan.

Implications of the Study

The theoretical basis of this study was formed by bringing together two areas, health education and judgment theory. The implications of the study related to judgment theory will be discussed first, followed by implications related to health education.

Judgment Theory. Judgments of physicians and patients were adequately represented by the linear model in this study. The application of judgment theory to judgments of self-behavior, as represented by patients' judgments in this study, has not been seen in other studies involving judgment tasks. It is possible that this study has thus made a unique contribution to the growing list of judgment tasks addressed by the judgment paradigm.

A comparative study in which the judgments of two groups of people are studied is also a relatively new application of judgment theory. This study is based on Hammond's adaptation of Brunswick's lens model. Hammond adapted the lens model to study cognitive conflict by focusing on the interaction of two subjects coping with a judgment task. Hammond called this model the triple-system case (Hammond & Joyce, 1975). This study applied the triple-system case to two groups of people rather than two subjects. By averaging across individuals in each group, a policy for each group could be examined and differences in policy between the two groups could be compared. By using groups rather than individuals,

generalizability and usefulness of the findings are enhanced.

The use of subjective weights to model judgments is also a relatively new area in the judgment paradigm. Simple comparisons of subjective weights and beta weights have typically been used. The results of this study indicated that self-reported subjective weighting was less useful than statistical weighting in explaining physicians' and patients' policy in judging the likelihood of a patient's adhering to a treatment plan.

Health Education. The finding that physicians made judgments that patients might likely not follow a treatment plan, and patients' judged that they would probably follow a treatment plan has important implications for health education. The patients in this study were taken from the pool of patients seen by the physicians participating in the study. Yet, physicians and patients indicated different expectations as to whether or not the treatment program would be followed. The major implication for health education is for health professionals to recognize and reinforce the positive intentions of a patient to carry out a treatment plan. Recognition of and praise for patients' positive intentions to try and carry out a treatment plan may serve to strengthen patients' motivation to follow-through on their intentions. If, however, a health professional displays a negative expectation that a treatment plan will be carried out, this may serve to weaken a patients' motivation.

It is recognized that patients frequently do not carry out a treatment plan, and thus it could be said that patients are unrealistic in their expectations and will not follow a treatment plan when it becomes difficult. Assuming that patients do lack awareness of the difficulty in carrying out a treatment program, professionals might help prepare

patients for reality by assisting them in anticipating and planning for difficulties. By helping a patient talk through some of the problems that might occur in implementing a treatment plan, health professionals might build on the positive intentions of patients found in this study, and facilitate the possibility that the intended behavior would be carried out.

In addressing the implications related to use of cues by physicians and patients, the finding that physicians and patients combine the cues in a complex fashion when making the judgments has led to both cautions and suggestions for health education. The cautions must be that the findings are complex, and how each cue is used by physicians and patients cannot be determined from this analysis. However, this finding may imply that the way in which individuals use the cues in making the judgment depends on the context in which the judgment is made, the components of the task, and the characteristics of the individual. Therefore, the goal of assisting the patient in carrying out a treatment plan may best be accomplished by a systematic assessment of the individual patient and prescriptive health education approach rather than looking for rules and algorithms to be applied in all situations. Certainly the finding that support received greater importance by physicians than patients must be addressed in this manner. Rather than making assumptions as to how this finding could be used in health education strategies, it might be more appropriate to say that support may be used and thought of in a more complex manner than anticipated by both physicians and patients. Until more knowledge is available on how it is used, it might be most useful to carefully assess the importance of support to each patient. Further, recognizing that physicians and patients seemed to be quite different in weighting this cue should alert health professionals

to be aware that their perceptions related to the cue support may be far different than those of the patient.

Finally, the finding that patients strongly predicted physicians would put most importance on the cue severity, and little on the other cues, may have implications for the physician-patient relationship. Patients indicated physicians were interested primarily in the severity of their illness, and not any factors having a personal association. Physicians did not indicate this emphasis on severity in making their judgments. However, patients are apparently perceiving that physicians do not think support, convenience and cost are important. Communication that would indicate to the patient the importance physicians were placing on the factors in the situation would be essential if physician-patient concordance is to be attained.

Recommendations for Future Research

This study represents an initial step in trying to better understand patients' and physicians' judgments, which is important in striving toward physician-patient concordance. Based on this study, recommendations are made for future research. Several general recommendations are made first, followed by specific research possibilities.

An essential goal in doing future research related to this study is to explore and develop means of gaining the cooperation and participation of practicing physicians. Meaningful research in health care cannot be carried out without the active involvement of clinicians. Avenues that might be useful to explore include: (1) greater emphasis in medical education on applied research; (2) involvement of practicing physicians' in planning and carrying out research; (3) screening by local medical societies of research requests made to physicians to decrease the time

demands on physicians and increase the possibility that the most useful studies will be considered; (4) granting of continuing education credits for active involvement in endorsed research projects.

Another general recommendation is to pursue research involving both providers and patients. There is a common tendency to concentrate on patients, perhaps because providers are difficult subjects to obtain. If patients are to be viewed as responsible partners in health care, the interaction and shared perceptions between patients and providers must be explored to strive toward the goal of physician-patient concordance. Further, application of judgment theory, problem solving and decision making hold promise in making health care cost effective for physicians and patients. One advantage of studies of judgment such as this research, is that judgments are analyzed in relation to the factors involved. Differences can be discussed as related to different weights assigned or different factors considered rather than assigning motives such as "the patient is being difficult" or "the physician is being arrogant." In doing this research, subjects frequently expressed opinions and personal theories about patients or physicians, many times assigning a motive for behavior they had perceived. Discussing weights, factors, and probabilities instead of assuming to understand another individual's motives is a more positive approach to the goal of physician-patient concordance.

Finally, it is suggested that research about judgments and decisions continue to be explored using a variety of techniques. These techniques might include multivariate and complex analyses to detect interactions between variables, decision trees, computer simulations, and thinking-aloud protocols. Each method has strengths and limitations, and will contribute to a broad base of knowledge necessary to gain an understanding

of the complexities of human judgment.

Several specific research possibilities present themselves. One possibility would be to design a study using different combinations and numbers of the independent variables. Based on findings from this study, it would be interesting to delete cost as an independent variable. Using 27 cases, a full design would consist of the cues convenience, severity and support as independent variables. With a full design, interactions would not be confounded and interpretations would be facilitated. Other cues could also be added or substituted in the design as warranted by further study. It would also be useful to replicate the study using hypertensive patients and compare their judgments with the non-hypertensive patients used in this study. Would hypertensive patients make as positive judgments about carrying out a treatment program? Building on this question, it would be interesting to study physicians' and patients' judgments using different health problems such as obesity and diabetes. Such studies would address the question of whether judgments are disease specific.

For this study, labels were removed from the descriptions of cues in the cases to prevent subjects from reacting to the label of high, medium, or low as well as to the description of the cue. It would be useful to study responses obtained from cases with and without labels. This is of practical importance because the use of labels would make the task easier and faster, and thus make the research more appealing to subjects.

It would be interesting to combine this judgment research with a criterion measure, that is, use both sides of the lens model. This would involve having some criterion measure to identify patients who adhere to a treatment program and those who do not. Further, it would be

interesting to study the relation between judgment and behavior. Do those patients who think they will carry out the physicians orders actually do it? This would involve defining outcome measures and use of longitudinal studies. An additional question that could be addressed by this type of long-term study would be the stability of judgments over time. Do patients and physicians change their judgments and the weights they assign to cues or are they stable between time intervals?

A question addressed but not answered in this study was whether judgments could be predicted by individual variables. Studies of this nature must have a larger number of subjects and variation of subjects on the variables most related to the judgments.

Finally, as knowledge is accumulated and the paradigm refined, it is hoped that studies can be done with one physician or provider and one patient, with the goal of enhancing physician-patient concordance. This would require a practical means of capturing the policy of physician and patient, and a useful means of giving cognitive feedback to resolve differences in policy and promote congruence. This recommendation is listed last not because of its relative importance, but because this research involves intervention in the policy process. Thus, the researcher would actually help the physician and patient to think, not just study how they presently use information. This type of intervention raises cautions that the underlying theory be sound, the measurement tools be as valid and reliable as possible, and the goals and limitations of the paradigm be clearly defined.

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APPENDIX A

Form Used In Recruitment of Physicians

PLEASE RETURN TO: MARILYN ROTHERT
DEPARTMENT OF COMMUNITY HEALTH SCIENCE
B109 CLINICAL CENTER
MICHIGAN STATE UNIVERSITY
EAST LANSING, MICHIGAN 48824
353-3990

- ☐ I will participate by completing the instrument.
- ☐ I will participate by making patients available for the study.
- ☐ I would like to be contacted to receive more information.

Name

Address

Prompt attention would be appreciated.

Thank you.

APPENDIX B

Form Used in Recruitment of Patients

RESEARCH PARTICIPANTS NEEDED

Dear Patients,

In order to improve health care, research is done and utilized within the Clinical Center. Currently, Marilyn Rotherth is conducting research to find out what people think about when they decide whether or not to carry out the doctor's order(s). This research involves collecting information from physicians and patients, and comparing it to see what is important to each party.

If you are over 20 years of age, and have never been told you have high blood pressure, you would qualify as a participant. Involvement would mean answering some questions, most of which are not of a personal nature. (There are no tests involved.) Your decision whether to participate or not will not affect the care/treatment you receive from your physician. Any information shared, should you participate, will be kept in confidence.

If you are interested and willing to participate in this study, please complete the form and tell the nurse, receptionist, physician or call Marilyn Rotherth at 353-3990 during the day or 337-1447 in the evening.

Your Health Care Team

Interested participants complete the following:

Name _____

Telephone Number _____

APPENDIX C

Instrument Used With Patients

EXPLANATION

Today, I am asking you to help me find out what people think about when they are deciding whether or not to carry out the doctor's orders. You know or you've heard about someone who didn't do what the doctor recommended. For example, you may know someone who didn't stay in bed and get the rest the doctor recommended. Perhaps you can think of someone who didn't stop smoking or stop drinking as the doctor ordered, or someone who didn't eat the foods on the special diet the doctor recommended.

The information you provide will help me look at what people think about when they are making these decisions of whether to do what the doctor ordered. I'll be asking doctors to do this study also. That way I can see if doctors and those who go to doctors are looking at the same things when thinking about the orders being carried out.

The information you give me will be used only for this study. All information obtained will be treated with strict confidence. People will remain anonymous, that is, the information collected will be identified by code number and I will be the only one who knows which number is assigned to whom.

Your decision to participate or not to participate in this study has nothing to do with the care or treatment you receive from your physician. You have the right to withdraw from the study at any time without penalty. While I appreciate you answering all of the questions, you have the right not to answer a question if you find it offensive or for other reasons choose not to answer it. However, I encourage you to answer all of the questions, and it is particularly important that you provide an answer to all of the cases.

This task will take less than an hour. First, you will be asked some background information. Then you will be asked to decide how likely you would be in a given situation to carry out the doctor's orders. You will be given 34 brief situations and asked to make this decision each time. This is followed by 3 questions asking what was important in making those decisions.

The results of the study, while not of direct benefit to you, will help me find better ways of helping people improve their health. Without your help, I could not do this study, and I greatly appreciate your cooperation. If you have any questions or would like a report of the results of the study when completed, please let me know. Thank you.

Marilyn Rothert
353-3990; 337-1447

This study looks at the following question: What do you consider important when you think about whether you will follow your doctor's orders? This background information is useful in helping me understand the results of this study. Please note that NO NAME OR ADDRESS IS REQUESTED AND INFORMATION THAT YOU PROVIDE WILL BE USED ONLY FOR THIS STUDY.

PLEASE CHECK THE APPROPRIATE BOX OR FILL IN THE BLANK

1. Are You: Male ☐ Female ☐
2. At the present time, are you: Married ☐ Divorced ☐
Widowed ☐ Single ☐
Separated ☐
3. Date of birth _____
4. How many children under age 18 live with you?
0 ☐
1 ☐
2 ☐
3 ☐
4 or more ☐
5. How many adults age 18 and over live with you?
0 ☐
1 ☐
2 ☐
3 ☐
4 or more ☐
6. What was your approximate total family income from all sources before taxes during the past year? NOTE: NO NAME OR ADDRESS IS REQUESTED AND INFORMATION THAT YOU PROVIDE WILL BE USED ONLY FOR THIS STUDY.

Under \$5,000 ☐	\$15,000-19,999 ☐
\$5,000-9,999 ☐	\$20,000-24,999 ☐
\$10,000-14,999 ☐	\$25,000 or more ☐
7. What is the highest level of education you have completed?

8th grade or less ☐	Bachelor's degree ☐
Graduated from high school ☐	Graduate degree ☐
At least 1 year of college ☐	
8. What is your employment status?

Employed ☐	Retired ☐
Homemaker ☐	Not employed ☐ (e.g. student)
Temporarily out of work ☐	Unemployed for
(Less than 1 year) ☐	more than one year ☐

9. If employed, what job title best describes what you do?

10. How would you judge your own health at the present time?

Excellent [] Good [] Fair [] Poor []

11. In the past 2 years, about how many times have you been to the doctor for your own health care?

0 [] 1-2 [] 3-5 [] 6-12 [] More than 12 []

12. Generally, how satisfied have you been with the medical care you have received from the doctor in the past 2 years?

Extremely satisfied [] Not very satisfied []

Very satisfied [] Extremely unsatisfied []

Satisfied []

13. In the past 2 years, did a doctor give you any orders that you were supposed to follow for your own health care after you left the doctor's office or hospital? (Examples of such orders might be medicine to take, special foods or diet, rest or exercise.)

Yes []

No []

14. If you answered yes, did you do everything the doctor asked you to do? That is, did you take all of the medicine at the right times; did you rest as you were supposed to, etc.?

All of the time [] Some of the time []

Most of the time [] Never []

15. Have you ever thought about what factors you consider important when you decide whether to follow the doctor's orders?

Yes []

No []

16. How do you most usually pay for visits to the doctor, medicines, lab tests, and other costs related to an office visit to the doctor?

Paid by Medicare/Medicaid []

Paid as a member of Health Maintenance Organization []

Generally paid by health insurance []

Paid by your own "out of pocket" money []

INFORMATION ABOUT HYPERTENSION

I'm going to be asking you to imagine that the doctor has told you that you have hypertension or high blood pressure. All of the judgments I will ask you to make will require you to imagine that you have hypertension. To help you understand what this is, here is a short description of hypertension and how it feels.

DEFINITION AND DISTRIBUTION IN THE POPULATION

Hypertension means high blood pressure. It is a condition that cannot be cured, but can be kept under control. It is estimated that 15-20% of adults have hypertension and about half of them do not know it. The average age at which people get high blood pressure is 32. Usually, the hypertension doesn't cause the person to feel any differently. Hypertension is more common in women than in men, but it is less harmful to the body in women than in men. Women with hypertension tend to be over-weight but men with hypertension are not different in weight from those without hypertension. Hypertension is also more common among blacks, particularly black males.

CAUSE

Usually the cause of the hypertension is not known, but it occurs more often in certain families. Also, people have a better chance of having hypertension if they drink a lot of alcohol or are overweight.

HOW IT FEELS

Because people with hypertension do not feel any different, they may not go to the doctor for 20 years. However, during this time the hypertension damages blood vessels throughout the body, especially in the eyes, heart, kidney and brain. Strokes, heart problems and kidney failure frequently result from high blood pressure that is not treated.

HYPERTENSION continued....

TREATMENT

Once persons are identified as having hypertension, their blood pressure should be checked frequently. The doctor usually recommends a treatment program to lower the blood pressure and lower the risks to health that result from having high blood pressure. The treatment is usually carried out for an indefinite period of time and may include any of the following:

Medicine- Usually pills to be taken around the clock.

Restricted Diet- Low in salt
 Low in cholesterol
 Low in calories if person is overweight

Regular visits to the doctor's office

Also, because of the increased risk of heart problems with hypertension, persons may be advised to decrease smoking.

For this study, the treatment program the doctor has prescribed for all cases is:

A restricted diet

A medication

A schedule for return visits to the doctor's office.

DEFINITIONS AND DESCRIPTIONS OF TERMS

I'll be asking you to judge how likely you would be to follow the doctor's orders in a number of imaginary situations. I'll give you four kinds of information about each situation. The four kinds are convenience, cost, severity of illness and support. These are definitions of each one of those areas.

CONVENIENCE: This represents the amount and difficulty of change in your usual daily activities or lifestyle that is required for you to carry out the doctor's orders. This change could affect you or those around you such as family or close friends. This could be a change in your usual eating habits; change in what you do during the day or when you do it; change in work patterns; change in recreation time or what you do when you're not working. Basically, convenience refers to any change in your daily habits. The three levels of convenience are:

You need to change many significant habits or important parts of your usual daily routine activities, creating a major change in lifestyle. These changes cause you a great deal of difficulty and disruption in your normal pattern of living.

You need to change at least one major habit or usual activity that will cause an important change in lifestyle. However, you are able to make the change without a great deal of difficulty while maintaining the rest of your normal pattern of living.

You need to change only a few small habits or usual activities which do not involve an important change in lifestyle. You can make the changes very easily without any difficulty while maintaining a normal pattern of living.

COST: This represents the total financial cost to you of carrying out the doctor's orders. This cost would include repeated office visits to see the doctor, loss of time from work, medications, transportation, babysitter, special foods and equipment related to doing what the doctor ordered. The three levels of cost are:

\$0-\$30 per month or \$0-\$360 per year.

\$30-\$60 per month or \$360-\$720 per year.

More than \$60 per month or more than \$720 per year.

DEFINITIONS AND DESCRIPTIONS continued....

SEVERITY OF HYPERTENSION: This represents how much higher than normal your blood pressure is, how long it has been high, how you feel physically, and how much chance the doctor says you have for having a stroke, or problems with heart or other organs because of your high blood pressure. The 3 levels of severity are:

The doctor says your blood pressure is somewhat higher than your normal and has been for several months. You feel no different than usual. The doctor says it is important to make sure your blood pressure does not get any higher or you stand a chance of stroke, heart or other problems.

The doctor says your blood pressure is quite a bit higher than your normal and has been going up slowly for 6 months. You feel no different than usual. The doctor says your blood pressure should be brought down or you may have a stroke, heart or other problems.

The doctor says your blood pressure is so high immediate action must be taken to bring it down or you're very likely to have a stroke, heart or other problems. You notice frequent morning headaches lately.

SUPPORT: This represents the amount and type of helpfulness and encouragement you get from those people who are important to you, such as people you live with, people you work with, and other friends and associates that are important to you and whom you see frequently. The three levels of support are:

Those people who are important to you and you see frequently discourage you from carrying out the doctor's orders and refuse to help you.

Those people who are important to you and you see frequently do not encourage or discourage you. They do not offer to help but will do so when asked.

Those people who are important to you and you see frequently encourage you to carry out the doctor's orders and offer any help that you need.

DIRECTIONS

PLEASE REMOVE THIS PAGE FROM THE BOOKLET AND REFER TO THE DIRECTIONS AND SCALE AS YOU READ AND MAKE JUDGMENTS ON EACH CASE.

After reading each of the following cases, you are asked to judge how likely you would be to carry out the doctor's orders in that situation. In this study, the treatment program the doctor has prescribed for all is:

- A restricted diet
- A medication
- A schedule for return visits to the doctor's office

Please read each case and decide how likely you would be to carry out the treatment plan for an indefinite period of time in the situation described. Make your decision using the following scale:

1. VERY CERTAIN THAT YOU WOULD NOT carry out all of the treatment plan
2. PROBABLY WOULD NOT carry out all of the treatment plan
3. MAY OR MAY NOT carry out all of the treatment plan
4. PROBABLY WOULD carry out all of the treatment plan
5. VERY CERTAIN THAT YOU WOULD carry out all of the treatment plan

For each case, write down the number from this scale that represents your decision as to how likely you would be to carry out the treatment plan for an indefinite period of time in the situation described. Continue until all cases are completed. The first 2 cases are practice cases, followed by the 32 cases used in the study.

Please try to consider the whole scale in making your decision, that is, consider all 5 numbers each time you make a judgment.

PRACTICE CASE 1

CONVENIENCE: Need to change only a few small habits or activities which do not cause an important change in lifestyle. You can make the changes very easily.

COST: More than \$60 per month or more than \$720 per year.

SEVERITY: Blood pressure so high immediate action needed to bring it down or very likely to have stroke, heart or other problems. Notice frequent morning headaches.

SUPPORT: People don't encourage or discourage you; don't offer help but will help when asked.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

Please think about carrying out the doctor's orders in these situations. Using the descriptions given, consider the convenience or inconvenience it will create for you, the financial cost to you of carrying out the treatment, the described severity of your hypertension (imagined) and the amount of support you can expect from people important to you. If you need to look back at the more detailed descriptions of convenience, cost, severity and support, or the information on hypertension, do so.

Write down your decision as to how likely you would be to carry out the treatment plan for an indefinite period of time in each situation. Write your decision on the line following the word ANSWER. Refer to the "Directions" and choose the number on the 5 point scale that represents your judgment. For example, if you feel you probably would not carry out all of the treatment plan in this situation, put a 2 on the line as your answer. Please try to consider the whole scale in making your decision, that is, consider all 5 numbers each time you make a judgment.

PRACTICE CASE 2

CONVENIENCE: Need to change at least 1 major habit or activity that will cause an important change in lifestyle. However, you can make the change without a great deal of difficulty.

COST: \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure quite a bit higher than normal, increasing past 6 months. Feel no different; risk of stroke or other problems if not lowered.

SUPPORT: People encourage you to carry out the doctor's orders and offer any help you need.

PRACTICE CASE 2 continued....

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE
TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

* * * * *

For the next 32 cases, please follow the same process you have used in the 2 practice cases. Write down your decision as to how likely you would be to carry out the treatment plan for an indefinite period of time in the situation described. Write your decision on the line following the word ANSWER. Refer to the "Directions" in making your decision and select the number on the scale that represents your judgment. Please try to consider all 5 numbers each time before making your choice.

CASE 1

CONVENIENCE: Need to change only a few small habits or activities which do not cause an important change in lifestyle. You can make the changes very easily.

COST: More than \$60 per month or more than \$720 per year.

SEVERITY: Blood pressure quite a bit higher than normal, increasing past 6 months. Feel no different; risk of stroke or other problems if not lowered.

SUPPORT: People don't encourage or discourage you; don't offer help but will help when asked.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 2

CONVENIENCE: Need to change many significant habits or activities creating a major change in lifestyle. Changes cause you a great deal of difficulty and disruption of normal pattern of living.

COST: More than \$60 per month or more than \$720 per year.

SEVERITY: Blood pressure somewhat higher than normal and has been for several months. Feel no different. Need to keep blood pressure from getting higher or stand a chance of stroke or other problems.

SUPPORT: People don't encourage or discourage you; don't offer help but will help when asked.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 3

CONVENIENCE: Need to change only a few small habits or activities which do not cause an important change in lifestyle. You can make the changes very easily.

COST: More than \$60 per month or more than \$720 per year.

SEVERITY: Blood pressure somewhat higher than normal and has been for several months. Feel no different. Need to keep blood pressure from getting higher or stand a chance of stroke or other problems.

SUPPORT: People discourage you from carrying out the doctor's orders and refuse to help you.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 4

CONVENIENCE: Need to change at least 1 major habit or activity that will cause an important change in lifestyle. However, you can make the change without a great deal of difficulty.

COST: \$0-\$30 per month or \$0-\$360 per year.

SEVERITY: Blood pressure quite a bit higher than normal, increasing past 6 months. Feel no different; risk of stroke or other problems if not lowered.

SUPPORT: People encourage you to carry out the doctor's orders and offer any help you need.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 5

CONVENIENCE: Need to change many significant habits or activities creating major change in lifestyle. Changes cause you a great deal of difficulty and disruption of normal pattern of living.

COST: \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure so high immediate action needed to bring it down or very likely to have stroke, heart or other problems. Notice frequent morning headaches.

SUPPORT: People don't encourage or discourage you; don't offer help but will help when asked.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 6

CONVENIENCE: Need to change many significant habits or activities creating a major change in lifestyle. Changes cause you a great deal of difficulty and disruption of normal pattern of living.

COST: \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure somewhat higher than normal and has been for several months. Feel no different. Need to keep blood pressure from getting higher or stand a chance of stroke or other problems.

SUPPORT: People encourage you to carry out the doctor's orders and offer any help you need.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 7

CONVENIENCE: Need to change at least 1 major habit or activity that will cause an important change in lifestyle. However, you can make the change without a great deal of difficulty.

COST: More than \$60 per month or more than \$720 per year.

SEVERITY: Blood pressure quite a bit higher than normal, increasing past 6 months. Feel no different; risk of stroke or other problems if not lowered.

SUPPORT: People discourage you from carrying out the doctor's orders and refuse to help you.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 8

CONVENIENCE: Need to change only a few small habits or activities which do not cause an important change in lifestyle. You can make the changes very easily.

COST: \$0-\$30 per month or \$0-\$360 per year.

SEVERITY: Blood pressure so high immediate action needed to bring it down or very likely to have stroke, heart or other problems. Notice frequent morning headaches.

SUPPORT: People don't encourage or discourage you; don't offer help but will help when asked.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 9

CONVENIENCE: Need to change only a few small habits or activities which do not cause an important change in lifestyle. You can make the changes very easily.

COST: \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure quite a bit higher than normal, increasing past 6 months. Feel no different; risk of stroke, or other problems if not lowered.

SUPPORT: People encourage you to carry out the doctor's orders and offer any help you need.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 10

CONVENIENCE: Need to change at least 1 major habit or activity that will cause an important change in lifestyle. However, you can make the change without a great deal of difficulty.

COST: \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure so high immediate action needed to bring it down or very likely to have stroke, heart or other problems. Notice frequent morning headaches.

SUPPORT: People encourage you to carry out the doctor's orders and offer any help you need.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 11

CONVENIENCE: Need to change many significant habits or activities creating a major change in lifestyle. Changes cause you a great deal of difficulty and disruption of normal pattern of living.

COST: More than \$60 per month or more than \$720 per year.

SEVERITY: Blood pressure so high immediate action needed to bring it down or very likely to have stroke, heart or other problems. Notice frequent morning headaches.

SUPPORT: People discourage you from carrying out the doctor's orders and refuse to help you.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 12

CONVENIENCE: Need to change many significant habits or activities creating a major change in lifestyle. Changes cause you a great deal of difficulty and disruption of normal pattern of living.

COST: \$0-\$30 per month or \$0-\$360 per year.

SEVERITY: Blood pressure somewhat higher than normal and has been for several months. Feel no different. Need to keep blood pressure from getting higher or stand a chance of stroke or other problems.

SUPPORT: People discourage you from carrying out the doctor's orders and refuse to help you.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 13

CONVENIENCE: Need to change at least 1 major habit or activity that will cause an important change in lifestyle. However, you can make the change without a great deal of difficulty.

COST: \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure somewhat higher than normal and has been for several months. Feel no different. Need to keep blood pressure from getting higher or stand a chance of stroke, or other problems.

SUPPORT: People discourage you from carrying out the doctor's orders and refuse to help you.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 14

CONVENIENCE: Need to change at least 1 major habit or activity that will cause an important change in lifestyle. However, you can make the change without a great deal of difficulty.

COST: \$0-\$30 per month or \$0-\$360 per year.

SEVERITY: Blood pressure somewhat higher than normal and has been for several months. Feel no different. Need to keep blood pressure from getting higher or stand a chance of stroke or other problems.

SUPPORT: People don't encourage or discourage you; don't offer help but will help when asked.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE THE TREATMENT PLAN FOR AN INDEFNITE PERIOD OF TIME?

ANSWER: _____

CASE 15

CONVENIENCE: Need to change only a few small habits or activities which do not cause an important change in lifestyle. You can make the changes very easily.

COST: More than \$60 per month or more than \$720 per year.

SEVERITY: Blood pressure so high immediate action needed to bring it down or very likely to have stroke, heart or other problems. Notice frequent morning headaches.

SUPPORT: People encourage you to carry out the doctor's orders and offer any help you need.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 16

CONVENIENCE: Need to change many significant habits or activities creating a major change in lifestyle. Changes cause you a great deal of difficulty and disruption of normal pattern of living.

COST: \$0-\$30 per month or \$0-\$360 per month.

SEVERITY: Blood pressure so high immediate action needed to bring it down or very likely to have stroke, heart or other problems. Notice frequent morning headaches.

SUPPORT: People encourage you to carry out the doctor's orders and offer any help you need.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFNITE PERIOD OF TIME?

ANSWER: _____

CASE 17

CONVENIENCE: Need to change only a few small habits or activities which do not cause an important change in lifestyle. You can make the changes very easily.

COST: \$0-\$30 per month or \$0-\$360 per year.

SEVERITY: Blood pressure quite a bit higher than normal, increasing past 6 months. Feel no different; risk of stroke or other problems if not lowered.

SUPPORT: People discourage you from carrying out the doctor's orders and refuse to help you.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 18

CONVENIENCE: Need to change many significant habits or activities creating a major change in lifestyle. Changes cause you a great deal of difficulty and disruption of normal pattern of living.

COST: \$0-\$30 per month or \$0-\$360 per year.

SEVERITY: Blood pressure quite a bit higher than normal, increasing past 6 months. Feel no different; risk of strokes or other problems if not lowered.

SUPPORT: People don't encourage or discourage you; don't offer help but will help when asked.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 19

CONVENIENCE: Need to change only a few small habits or activities
which do not cause an important change in lifestyle.

COST: \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure so high immediate action needed to bring
it down or very likely to have stroke, heart or other problems.
Notice frequent morning headaches.

SUPPORT: People discourage you from carrying out the doctor's
orders and refuse to help you.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY
OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 20

CONVENIENCE: Need to change many significant habits or activities
creating a major change in lifestyle. Changes cause you a
great deal of difficulty and disruption of normal pattern of
living.

COST: More than \$60 per month or more than \$720 per year.

SEVERITY: Blood pressure quite a bit higher than normal, increasing
past 6 months. Feel no different; risk of stroke or other
problems if not lowered.

SUPPORT: People encourage you to carry out the doctor's orders
and offer any help you need.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY
OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 21

CONVENIENCE: Need to change many significant habits or activities creating a major change in lifestyle. Changes cause you a great deal of difficulty and disruption of normal pattern of living.

COST: \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure quite a bit higher than normal, increasing past 6 months. Feel no different; risk of stroke or other problems if not lowered.

SUPPORT: People discourage you from carrying out the doctor's orders and refuse to help you.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 22

CONVENIENCE: Need to change only a few small habits or activities which do not cause an important change in lifestyle. You can make the changes very easily.

COST: \$30-\$60 per month or \$360-\$720 per month.

SEVERITY: Blood pressure somewhat higher than normal and has been for several months. Feel no different. Need to keep blood pressure from getting higher or stand a chance of stroke or other problems.

SUPPORT: People don't encourage or discourage you; don't offer help but will help when asked.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 23

CONVENIENCE: Need to change at least 1 major habit or activity that will cause an important change in lifestyle. However, you can make the change without a great deal of difficulty.

COST: \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure quite a bit higher than normal, increasing past 6 months. Feel no different; risk of stroke or other problems if not lowered.

SUPPORT: People don't encourage or discourage you; don't offer help but will help when asked.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 24

CONVENIENCE: Need to change at least 1 major habit or activity that will cause an important change in lifestyle. However, you can make the change without a great deal of difficulty.

COST: More than \$60 per month or more than \$720 per year.

SEVERITY: Blood pressure so high immediate action needed to bring it down or very likely to have stroke, heart or other problems, Notice frequent morning headaches.

SUPPORT: People don't encourage or discourage you; don't offer help but will help when asked.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 25

CONVENIENCE: Need to change only a few small habits or activities which do not cause an important change in lifestyle. You can make the changes very easily.

COST: \$0-\$30 per month or \$0-\$360 per year.

SEVERITY: Blood pressure somewhat higher than normal and has been for several months. Feel no different. Need to keep blood pressure from getting higher or stand a chance of stroke or other problems.

SUPPORT: People encourage you to carry out the doctor's orders and offer any help you need.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 26

CONVENIENCE: Need to change at least 1 major habit or activity that will cause an important change in lifestyle. However, you can make the change without a great deal of difficulty.

COST: \$0-\$30 per month or \$0-\$360 per year.

SEVERITY: Blood pressure so high immediate action needed to bring it down or very likely to have stroke, heart or other problems. Notice frequent morning headaches.

SUPPORT: People discourage you from carrying out the doctor's orders and refuse to help you.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 27

CONVENIENCE: Need to change at least 1 major habit or activity that will cause an important change in lifestyle. However, you can make the change without a great deal of difficulty.

COST: More than \$60 per month or more than \$360 per year.

SEVERITY: Blood pressure somewhat higher than normal and has been for several months. Feel no different. Need to keep blood pressure from getting higher or stand a chance of stroke or other problems.

SUPPORT: People encourage you to carry out the doctor's orders and offer any help you need.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 28

CONVENIENCE: Need to change only a few small habits or activities which do not cause an important change in lifestyle. You can make the changes very easily.

COST: More than \$60 per month or more than \$720 per year.

SEVERITY: Blood pressure quite a bit higher than normal, increasing past 6 months. Feel no different; risk of stroke or other problems if not lowered.

SUPPORT: People don't encourage or discourage you; don't offer help but will help when asked.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 29

CONVENIENCE: Need to change many significant habits or activities creating a major change in lifestyle. Changes cause you a great deal of difficulty and disruption of normal pattern of living.

COST: \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure somewhat higher than normal and has been for several months. Feel no different. Need to keep blood pressure from getting higher or stand a chance of stroke or other problems.

SUPPORT: People encourage you to carry out the doctor's orders and offer any help you need.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 30

CONVENIENCE: Need to change at least 1 major habit or activity that will cause an important change in lifestyle. However, you can make the change without a great deal of difficulty.

COST: \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure somewhat higher than normal and has been for several months. Feel no different. Need to keep blood pressure from getting higher or stand a chance of stroke or other problems.

SUPPORT: People discourage you from carrying out the doctor's orders and refuse to help you.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 31

CONVENIENCE: Need to change only a few small habits or activities which do not cause an important change in lifestyle. You can make the changes very easily.

COST: \$0-\$30 per month or \$0-\$360 per year.

SEVERITY: Blood pressure quite a bit higher than normal, increasing past 6 months. Feel no different; risk of stroke or other problems if not lowered.

SUPPORT: People discourage you from carrying out the doctor's orders and refuse to help you.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 32

CONVENIENCE: Need to change only a few small habits or activities which do not cause an important change in lifestyle. You can make the changes very easily.

COST: \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure somewhat higher than normal and has been for several months. Feel no different. Need to keep blood pressure from getting higher or stand a chance of stroke or other problems.

SUPPORT: People don't encourage or discourage you; don't offer help but will help when asked.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD YOU BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

Please turn the page and answer the next 3 questions.

- A. Please spread 100 points between the four kinds of information according to how important each one has been in the decisions you have made. It may be easier to think of percent, that is, what percent of importance did you place on each type of information?

EXAMPLE: If a person were buying a car, he might be thinking about LOOKS, PERFORMANCE, COST, and DEALER in deciding whether or not to buy the car. If cost were the most important, performance the next important, and looks and dealer not too important to you, you might spread the 100 points out as follows:

Looks	15
Performance	30
Cost	45
Dealer	10

100 points or 100%

In your decisions about carrying out the treatment plan, how important was each of these kinds of information?

Convenience _____

Cost _____

Severity _____

Support _____

100 points or 100%

- B. Are there any other important kinds of information you use when thinking about how likely you are to carry out the doctor's orders?

Yes [] No []

If yes, please indicate the importance each has in your judgment by spreading 100 points over the four kinds of information plus the ones you have identified.

Convenience _____
Cost _____
Severity _____
Support _____

Other (Please name)

100 points or 100%

- C. How do you think the doctor uses the four kinds of information when he thinks about how likely you are to carry out his orders?
Do you think the doctor uses this information the same as you do?

Yes [] No []

If no, how do you think he uses it?

Please spread 100 points between the four types of information according to how you think the doctor uses them when thinking about how likely you are to carry out his orders.

Convenience	_____
Cost	_____
Severity	_____
Support	_____

100 points or 100%

THANK YOU VERY MUCH FOR YOUR HELP

APPENDIX D

Instrument Used With Physicians

EXPLANATION

The number of patients who modify or fail to carry out the therapeutic regimen prescribed for them by their physician is a source of great concern to all health care professionals. This study is an attempt to gather information about what factors are important to the patient in deciding whether or not to carry out the prescribed regimen, and what factors the physician thinks are important to the patient in making that decision. It is hoped the information gained will be useful in making health education and indeed our health care delivery more useful to the consumer and more rewarding to the physician.

This study is being done with patients as well as physicians. Although the wording varies slightly, the identical task is being given to patients and physicians. The disease entity used as a basis for the cases in the study is hypertension. Information regarding hypertension is presented to the patients in the study so that they may be adequately prepared to make the judgments. For your information, a copy of the explanation provided the patients is included in your instrument.

The information you give me will be used only for this study. All information obtained from this study will be treated with strict confidence. Subjects will remain anonymous, i.e. the data sheets will be identified by code number and only the investigator will know which number is assigned to whom.

You have the right to withdraw from the study at any time without penalty. While I appreciate you answering all of the questions, you have the right not to answer a question if you find it offensive or for other reasons choose not to answer it. However, I encourage you to complete the instrument, and it is particularly important that you provide an answer to all the cases.

This task will take about 1/2 hour. First you will be asked some background information. Then you will be asked to judge how likely the patient would be in a given situation to carry out the doctor's orders. You will be given 34 brief situations and asked to make this judgment each time. This is followed by 3 questions concerning how you made those judgments.

The results of the study, while not of direct benefit to you, will be used to try and find better ways of helping people carry out health promoting behavior. Without your help, I could not do this study. Your time and cooperation are greatly appreciated. If you have any questions, or would like a report of the results of the study when completed, please contact me. Thank you.

Marilyn Rothert
B109 Clinical Center
353-3990; 337-1447

This is a study to examine what you as a physician consider important in thinking about how likely a patient is to follow your orders. The background information is useful in helping me understand the results of this study. Please note that NO NAME OR ADDRESS IS REQUESTED AND INFORMATION THAT YOU PROVIDE WILL BE USED ONLY FOR THIS STUDY.

PLEASE CHECK THE APPROPRIATE BOX OR FILL IN THE BLANK

1. Are you: Male ☐ Female ☐
2. At the present time, are you: Married ☐ Divorced ☐
Widowed ☐ Single ☐
Separated ☐
3. Date of birth: _____
4. How many children under age 18 live with you?
0 ☐
1 ☐
2 ☐
3 ☐
4 or more ☐
5. How many adults age 18 and over live with you?
0 ☐
1 ☐
2 ☐
3 ☐
4 or more ☐
6. Your medical degree is:
DO ☐ MD ☐
7. How many years have you worked in an ambulatory care setting? _____
8. Have you had any educational experiences (conferences, classes, workshops, etc.) related to compliance, i.e. patient adherence to prescribed regimen?
Yes ☐ No ☐
9. If a patient is not following the regimen you prescribed, which one of the following would you most likely do?

Repeat the instructions ☐	Give patient more information on why treatment is necessary ☐
Do nothing as compliance is basically the patient's responsibility ☐	Advise patient to get a new physician ☐
Get more information from the patient as to why the prescribed regimen is not being carried out ☐	Other, please explain ☐

Please answer the next 4 questions by thinking of situations in which you have been a patient, and by thinking of your own health care.

10. How would you judge your own health at the present time?

Excellent [] Good [] Fair [] Poor []

11. In the past 2 years, approximately how many times have you sought the help of a physician for a health problem?

0 [] 1-2 [] 3-5 [] 6-12 [] More than 12 []

12. How satisfied have you been with the medical care you have received from the physician in the past 2 years?

Extremely satisfied [] Not very satisfied []

Very Satisfied [] Extremely unsatisfied []

Satisfied []

13. In the past 2 years, did a physician prescribe any treatment program for you that you needed to carry out away from the doctor's office, such as medicine, diet, rest or exercise?

Yes [] No []

If you answered yes, did you completely follow all of the advice of the physician by carrying out the treatment exactly as the physician prescribed it?

All of the time [] Most of the time []

Some of the time [] Never []

14. Please consider the adult patients you see in your practice and estimate the % of your patients represented in each category.

EMPLOYMENT

Estimate the % of your patients in each category.

Homemaker	_____ %
Blue Collar Worker	_____ %
Professional	_____ %
Retired	_____ %
Unemployed	_____ %

AGE

Estimate the % of your adult patients in each category.

20-45 years	_____ %
45-65 years	_____ %
65 and over	_____ %

14. Profile of patients continued....

PAYMENT

What % of your patients primarily pay for office visits, medications, laboratory tests and related costs by the following means?

Medicare/Medicad	_____	%
Paid because HMO member	_____	%
Generally paid by health insurance	_____	%
Paid by "out of pocket" money	_____	%

EDUCATION

Estimate what % of your patients have obtained the following levels of education.

Less than high school diploma	_____	%
High school graduate	_____	%
At least some college level education	_____	%

15. What type of practice do you have?

General practice []

Specialty [] Please identify _____

Other [] Please explain _____

16. What best describes the organization of your practice?

Solo practice

Group practice []

Other [] Please explain _____

17. What allied health care personnel are a part of your practice?

Nurses []

Physicians Assistants []

Other Please identify _____

18. Please estimate what % of the patient education in your practice is carried out by the allied health care personnel.

_____ %

INFORMATION ABOUT HYPERTENSION

The following information is a part of the patients' instrument. For your information, it is provided here exactly as it is presented to the patients.

I'm going to be asking you to imagine that the doctor has told you that you have hypertension or high blood pressure. All of the judgments I will ask you to make will require you to imagine that you have hypertension. To help you understand what this is, here is a short description of hypertension and how it feels.

DEFINITION AND DISTRIBUTION IN THE POPULATION

Hypertension means high blood pressure. It is a condition that cannot be cured, but can be kept under control. It is estimated that 15-20% of adults have hypertension and about half of them do not know it. The average age at which people get high blood pressure is 32. Usually, the hypertension doesn't cause the person to feel any differently. Hypertension is more common in women than in men, but it is less harmful to the body in women than in men. Women with hypertension tend to be overweight but men with hypertension are not different in weight from those without hypertension. Hypertension is also more common among blacks, particularly black males.

CAUSE

Usually the cause of the hypertension is not known, but it occurs more often in certain families. Also, people have a better chance of having hypertension if they drink a lot of alcohol or are overweight.

HOW IT FEELS

Because people with hypertension do not feel any different, they may not go to the doctor for 20 years. However, during this time the hypertension damages blood vessels throughout the body, especially in

HYPERTENSION continued....

the eyes, heart, kidney and brain. Strokes, heart problems and kidney failure frequently result from high blood pressure that is not treated.

TREATMENT

Once persons are identified as having hypertension, their blood pressure should be checked frequently. The doctor usually recommends a treatment program to lower the blood pressure and lower the risks to health that result from having high blood pressure. The treatment is usually carried out for an indefinite period of time and may include any of the following:

- Medicine-Usually pills to be taken around the clock

- Restricted Diet-Low in salt

- Low in cholesterol

- Low in calories if person is overweight

Regular visits to the doctor's office

Also, because of the increased risk of heart problems with hypertension, persons may be advised to decrease smoking.

For this study, the treatment program the doctor has prescribed for all cases is:

- A restricted diet

- A medication

- A schedule for return visits to the doctor's office

DEFINITIONS AND DESCRIPTIONS OF TERMS

This study will ask you to judge how likely a patient would be to carry out the prescribed therapeutic regimen in specific situations. The situations are defined by giving you four kinds of information about the patient; that is, the convenience and cost of carrying out the regimen, the severity of the patient's illness and the support available to the patient. These terms are specifically described and defined into three levels as follows:

CONVENIENCE: This represents the amount and difficulty of change in the patient's usual daily activities or lifestyle that is required for the patient to carry out the prescribed treatment program. This change could affect the patient directly or those close to the patient such as family and friends. It could be a change in usual eating habits, change in what the patient does during the day or when it is done, change in work patterns, change in recreation time or what the patient does when not working. This involves any change in daily habits. The three levels of convenience are:

The patient needs to change many significant habits or important parts of usual daily routine activities, creating a major change in lifestyle. These changes cause a great deal of difficulty and disruption in the normal pattern of living.

The patient needs to change at least one major habit or usual activity that will cause an important change in lifestyle. However, the patient is able to make the change without a great deal of difficulty while maintaining the rest of a normal pattern of living.

The patient needs to change only a few small habits or usual activities which do not involve an important change in lifestyle. The patient can make the changes very easily without any difficulty while maintaining a normal pattern of living.

COST: This represents the total financial cost to the patient of carrying out the recommendations of the doctor. This cost would include repeated office visits to see the doctor, loss of time from work, medications, transportation, babysitter, special foods and equipment related to carrying out the physician's prescribed treatments. The three levels of cost are:

\$0-\$30 per month or \$0-\$360 per year.

\$30-\$60 per month or \$360-\$720 per year.

More than \$60 per month or more than \$720 per year.

DEFINITIONS AND DESCRIPTIONS continued....

SEVERITY OF HYPERTENSION: This represents a general statement of the level of the blood pressure, length of time it has been elevated, symptoms the patient has presented, and the risk factor that has been explained to the patient in terms of stroke, heart or other problems. The three levels of hypertension are:

Blood pressure consistently higher than normal for several months. No symptoms reported by patient. Patient has been told that some precautions are necessary to prevent risk of stroke or other complications.

Blood pressure significantly higher than normal increasing over past 6 months. No symptoms reported by patient. Patient has been told that blood pressure should be brought down to prevent risk of stroke or other complications.

Blood pressure extremely high and patient complaining of frequent morning headaches. Patient told that action must be taken immediately to bring blood pressure down to prevent stroke or other complications.

SUPPORT: This represents the amount and type of helpfulness and encouragement provided to the patient by those people who are important to the patient. This might include those with whom the patient lives, those with whom the patient works, and other friends and associates whose relationship the patient values and whom the patient sees frequently. The three levels of support are:

Those people who are important to the patient discourage the patient from carrying out the prescribed medical treatment and refuse to help.

Those people who are important to the patient do not encourage or discourage the patient to carry out the prescribed medical treatment. They do not offer to help but will do so when asked.

Those people who are important to the patient encourage the patient to carry out the prescribed medical treatment and offer any help needed.

DIRECTIONS

PLEASE REMOVE THIS PAGE FROM THE BOOKLET AND REFER TO THE DIRECTIONS AND SCALE AS YOU READ AND MAKE JUDGMENTS ON EACH CASE.

After reading each of the following cases, you are asked to judge how likely the patient would be to carry out the doctor's orders in that situation. In this study, the treatment program the doctor has prescribed for all cases is:

- A restricted diet
- A medication
- A schedule for return visits to the doctor's office

Please read each case and decide how likely the patient would be to carry out the treatment plan for an indefinite period of time in the situation described. Make your decision using the following scale:

1. VERY CERTAIN THAT THE PATIENT WOULD NOT carry out all of the treatment plan
2. PATIENT PROBABLY WOULD NOT carry out all of the treatment plan
3. PATIENT MAY OR MAY NOT carry out all of the treatment plan
4. PATIENT PROBABLY WOULD carry out all of the treatment plan
5. VERY CERTAIN THAT THE PATIENT WOULD carry out all of the treatment plan

For each case, write down the number from this scale that represents your decision as to how likely the patient would be to carry out the treatment plan for an indefinite period of time in the situation described. Continue until all cases are completed. The first 2 cases are practice cases, followed by the 32 cases used in the study.

Please try to consider the whole scale in making your decision, that is, consider all 5 numbers each time you make a judgment.

PRACTICE CASE 1

CONVENIENCE: Patient needs to change only a few small habits or activities which do not involve an important change in lifestyle. Patient can make the changes very easily.

COST: Total cost to patient more than \$60 per month or more than \$720 per year.

SEVERITY: Blood pressure extremely high and patient complaining of frequent morning headaches.

SUPPORT: People don't encourage or discourage patient; don't offer help but will help when asked.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

Please think about whether the patient will carry out the doctor's orders in the above situation. Using the descriptions given, consider the convenience or inconvenience it will create for the patient, the financial cost to the patient, the described severity of hypertension, and the amount of support the patient can expect from people important to the patient. If you need to look back at the more detailed descriptions of convenience, cost, severity of illness and support, do so.

Write down your decision as to how likely you think the patient would be to carry out the treatment plan for an indefinite period of time in each situation. Write your decision on the line following the word ANSWER. Refer to the "DIRECTIONS" and choose the number on the 5 point scale that represents your judgment. For example, if you feel the patient would probably not carry out all of the treatment plan in this situation, put a 2 on the line as your answer. Please try to consider the whole scale in making your decision, that is, consider all 5 numbers each time you make a judgment.

PRACTICE CASE 2

CONVENIENCE: Patient needs to change at least 1 major habit or activity that will cause an important change in lifestyle. However, patient can make the change without a great deal of difficulty.

COST: Total cost to patient \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure significantly high, increasing past 6 months.
No symptoms reported.

PRACTICE CASE 2 continued....

SUPPORT: People encourage the patient to carry out the prescribed regimen and offer any help needed.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

* * * * *

For the next 32 cases, please follow the same process you have used in the 2 practice cases. Write down your decision as to how likely the patient would be to carry out the treatment plan for an indefinite period of time in the situation described. Write your decision on the line following the word ANSWER. Refer to the "DIRECTIONS" in making your decision and select the number on the scale that represents your judgment. Please try to consider the whole scale in making your decision, that is, consider all 5 numbers each time before making your choice.

CASE 1

CONVENIENCE: Patient needs to change only a few small habits or activities which do not involve an important change in lifestyle. Patient can make the changes very easily.

COST: Total cost to patient more than \$60 per month or more than \$720 per year.

SEVERITY: Blood pressure significantly high, increasing past 6 months.
No symptoms reported.

SUPPORT: People don't encourage or discourage patient; don't offer help but will help when asked.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 2

CONVENIENCE: Patient needs to change many significant habits or activities creating a major change in lifestyle. Changes cause patient a great deal of difficulty and disruption of normal pattern of living.

COST: Total cost to patient more than \$60 per month or more than \$720 per year.

SEVERITY: Blood pressure consistently higher than normal for several months. No symptoms reported by patient.

SUPPORT: People don't encourage or discourage patient; don't offer help but will help when asked.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 3

CONVENIENCE: Patient needs to change only a few small habits or activities which do not involve an important change in lifestyle. Patient can make the changes very easily.

COST: Total cost to patient more than \$60 per month or more than \$720 per year.

SEVERITY: Blood pressure consistently higher than normal for several months. No symptoms reported by patient.

SUPPORT: People discourage patient from carrying out prescribed regimen and refuse to help.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 4

CONVENIENCE: Patient needs to change at least 1 major habit or activity that will cause an important change in lifestyle. However, patient can make the change without a great deal of difficulty.

COST: Total cost to patient \$0-\$30 per month or \$0-\$360 per year.

SEVERITY: Blood pressure significantly high, increasing past 6 months. No symptoms reported.

SUPPORT: People encourage the patient to carry out the prescribed regimen and offer any help needed.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 5

CONVENIENCE: Patient needs to change many significant habits or activities creating a major change in lifestyle. Changes cause patient a great deal of difficulty and disruption of normal pattern of living.

COST: Total cost to patient \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure extremely high and patient complaining of frequent morning headaches.

SUPPORT: People don't encourage or discourage patient; don't offer help but will help when asked.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

* * * * *

CASE 6

CONVENIENCE: Patient needs to change many significant habits or activities creating a major change in lifestyle. Changes cause patient a great deal of difficulty and disruption of normal pattern of living.

COST: Total cost to patient \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure consistently higher than normal for several months. No symptoms reported by patient.

SUPPORT: People encourage the patient to carry out the prescribed regimen and offer any help needed.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

* * * * *

CASE 7

CONVENIENCE: Patient needs to change at least one major habit or activity that will cause an important change in lifestyle. However, patient can make the change without a great deal of difficulty.

COST: Total cost to patient more than \$60 per month or more than \$720 per year.

SEVERITY: Blood pressure significantly high, increasing past 6 months. No symptoms reported.

SUPPORT: People discourage patient from carrying out prescribed regimen and refuse to help.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 8

CONVENIENCE: Patient needs to change only a few small habits or activities which do not involve an important change in lifestyle. Patient can make the changes very easily.

COST: Total cost to patient \$0-\$30 per month or \$0-\$360 per year.

SEVERITY: Blood pressure extremely high and patient complaining of frequent morning headaches.

SUPPORT: People don't encourage or discourage patient; don't offer help but will help when asked.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 9

CONVENIENCE: Patient needs to change only a few small habits or activities which do not involve an important change in lifestyle. Patient can make the changes very easily.

COST: Total cost to patient \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure significantly high, increasing past 6 months.
No symptoms reported.

SUPPORT: People encourage the patient to carry out the prescribed regimen and offer any help needed.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 10

CONVENIENCE: Patient needs to change at least one major habit or activity that will cause an important change in lifestyle.

COST: Total cost to patient \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure extremely high and patient complaining of frequent morning headaches.

SUPPORT: People encourage the patient to carry out the prescribed regimen and offer any help needed.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 11

CONVENIENCE: Patient needs to change many significant habits or activities creating a major change in lifestyle. Changes cause patient a great deal of difficulty and disruption of normal pattern of living.

COST: Total cost to patient more than \$60 per month or more than \$720 per year.

SEVERITY: Blood pressure extremely high and patient complaining of frequent morning headaches.

SUPPORT: People discourage patient from carrying out prescribed regimen and refuse to help.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 12

CONVENIENCE: Patient needs to change many significant habits or activities creating a major change in lifestyle. Changes cause patient a great deal of difficulty and disruption of normal pattern of living.

COST: Total cost to patient \$0-\$30 per month or \$0-\$360 per year.

SEVERITY: Blood pressure consistently higher than normal for several months. No symptoms reported by patient.

SUPPORT: People discourage patient from carrying out prescribed regimen and refuse to help.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 13

CONVENIENCE: Patient needs to change at least 1 major habit or activity that will cause an important change in lifestyle. However, patient can make the change without a great deal of difficulty.

COST: Total cost to patient \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure consistently higher than normal for several months. No symptoms reported by patient.

SUPPORT: People discourage patient from carrying out prescribed regimen and refuse to help.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 14

CONVENIENCE: Patient needs to change at least 1 major habit or activity that will cause an important change in lifestyle. However, patient can make the change without a great deal of difficulty.

COST: Total cost to patient \$0-\$30 per month or \$0-\$360 per year.

SEVERITY: Blood pressure consistently higher than normal for several months. No symptoms reported by patient.

SUPPORT: People don't encourage or discourage patient; don't offer help but will help when needed.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 15

CONVENIENCE: Patient needs to change only a few small habits or activities which do not involve an important change in lifestyle. Patient can make the changes very easily.

COST: Total cost to patient more than \$60 per month or more than \$720 per year.

SEVERITY: Blood pressure extremely high and patient complaining of frequent morning headaches.

SUPPORT: People encourage the patient to carry out the prescribed regimen and offer any help needed.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

* * * * *

CASE 16

CONVENIENCE: Patient needs to change many significant habits or activities creating a major change in lifestyle. Changes cause patient a great deal of difficulty and disruption of normal pattern of living.

COST: Total cost to patient \$0-\$30 per month or \$0-\$360 per year.

SEVERITY: Blood pressure extremely high and patient complaining of frequent morning headaches.

SUPPORT: People encourage the patient to carry out the prescribed regimen and offer any help needed.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

* * * * *

CASE 17

CONVENIENCE: Patient needs to change only a few small habits or activities which do not involve an important change in lifestyle. Patient can make the changes very easily.

COST: Total cost to patient \$0-\$30 per month or \$0-\$360 per year.

SEVERITY: Blood pressure significantly high, increasing past 6 months. No symptoms reported.

SUPPORT: People discourage patient from carrying out prescribed regimen and refuse to help.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 18

CONVENIENCE: Patient needs to change many significant habits or activities creating a major change in lifestyle. Changes cause patient a great deal of difficulty and disruption of normal pattern of living.

COST: Total cost to patient \$0-\$30 per month or \$0-\$360 per year.

SEVERITY: Blood pressure significantly high. Increasing past 6 months. No symptoms reported.

SUPPORT: People don't encourage or discourage patient; don't offer help but will help when asked.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 19

CONVENIENCE: Patient needs to change only a few small habits or activities which do not involve an important change in lifestyle. Patient can make the changes very easily.

COST: Total cost to patient \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure extremely high and patient complaining of frequent morning headaches.

SUPPORT: People discourage patient from carrying out prescribed regimen and refuse to help.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

* * * * *

CASE 20

CONVENIENCE: Patient needs to change many significant habits or activities creating a major change in lifestyle. Changes cause patient a great deal of difficulty and disruption of normal pattern of living.

COST: Total cost to patient more than \$60 per month or more than \$720 per year.

SEVERITY: Blood pressure significantly high, increasing past 6 months. No symptoms reported.

SUPPORT: People encourage the patient to carry out the prescribed regimen and offer any help needed.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

* * * * *

CASE 21

CONVENIENCE: Patient needs to change many significant habits or activities creating a major change in lifestyle. Changes cause patient a great deal of difficulty and disruption of normal pattern of living.

COST: Total cost to patient \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure significantly high, increasing past 6 months. No symptoms reported.

SUPPORT: People discourage patient from carrying out prescribed regimen and refuse to help.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 22

CONVENIENCE: Patient needs to change only a few small habits or activities which do not involve an important change in lifestyle. Patient can make the changes very easily.

COST: Total cost to patient \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure consistently higher than normal for several months. No symptoms reported by patient.

SUPPORT: People don't encourage or discourage patient; don't offer help but will help when asked.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 23

CONVENIENCE: Patient needs to change at least one major habit or activity that will cause an important change in lifestyle. However, patient can make the change without a great deal of difficulty.

COST: Total cost to patient \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure significantly high, increasing past 6 months. No symptoms reported.

SUPPORT: People don't encourage or discourage patient; don't offer help but will help when asked.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 24

CONVENIENCE: Patient needs to change at least 1 major habit or activity that will cause an important change in lifestyle. However, patient can make the change without a great deal of difficulty.

COST: Total cost to patient more than \$60 per month or more than \$720 per year.

SEVERITY: Blood pressure extremely high and patient complaining of frequent morning headaches.

SUPPORT: People don't encourage or discourage patient; don't offer help but will help when asked.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 25

CONVENIENCE: Patient needs to change only a few small habits or activities which do not involve an important change in lifestyle. Patient can make the changes very easily.

COST: Total cost to patient \$0-\$30 per month or \$0-\$360 per year.

SEVERITY: Blood pressure consistently higher than normal for several months. No symptoms reported by patient.

SUPPORT: People encourage the patient to carry out the prescribed regimen and offer any help needed.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

* * * * *

CASE 26

CONVENIENCE: Patient needs to change at least 1 major habit or activity that will cause an important change in lifestyle. However, patient can make the change without a great deal of difficulty.

COST: Total cost to patient \$0-\$30 per month or \$0-360 per year.

SEVERITY: Blood pressure extremely high and patient complaining of frequent morning headaches.

SUPPORT: People discourage patient from carrying out prescribed regimens and refuse to help.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

* * * * *

CASE 27

CONVENIENCE: Patient needs to change at least 1 major habit or activity that will cause an important change in lifestyle. However, patient can make the change without a great deal of difficulty.

COST: Total cost to patient more than \$60 per month or more than \$720 per year.

SEVERITY: Blood pressure consistently higher than normal for several months. No symptoms reported by patient.

SUPPORT: People encourage the patient to carry out the prescribed regimen and offer any help needed.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

* * * * *

CASE 28

CONVENIENCE: Patient needs to change only a few small habits or activities which do not involve an important change in lifestyle. Patient can make the changes very easily.

COST: Total cost to patient more than \$60 per month or more than \$720 per year.

SEVERITY: Blood pressure significantly high, increasing past 6 months. No symptoms reported.

SUPPORT: People don't encourage or discourage patient, don't offer help but will help when asked.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

* * * * *

CASE 29

CONVENIENCE: Patient needs to change many significant habits or activities creating a major change in lifestyle. Changes cause patient a great deal of difficulty and disruption of normal pattern of living.

COST: Total cost to patient \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure consistently higher than normal for several months. No symptoms reported by patient.

SUPPORT: People encourage the patient to carry out the prescribed regimen and offer any help needed.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 30

CONVENIENCE: Patient needs to change at least 1 major habit or activity that will cause an important change in lifestyle. However, patient can make the change without a great deal of difficulty.

COST: Total cost to patient \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure consistently higher than normal for several months. No symptoms reported by patient.

SUPPORT: People discourage patient from carrying out prescribed regimen and refuse to help.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

CASE 31

CONVENIENCE: Patient needs to change only a few small habits or activities which do not involve an important change in lifestyle. Patient can make the changes very easily.

COST: Total cost to patient \$0-\$30 per month or \$0-\$360 per year.

SEVERITY: Blood pressure significantly high, increasing past 6 months. No symptoms reported.

SUPPORT: People discourage patient from carrying out prescribed regimen and refuse to help.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

* * * * *

CASE 32

CONVENIENCE: Patient needs to change only a few small habits or activities which do not involve an important change in lifestyle. Patient can make the changes very easily.

COST: Total cost to patient \$30-\$60 per month or \$360-\$720 per year.

SEVERITY: Blood pressure consistently higher than normal for several months. No symptoms reported by patient.

SUPPORT: People don't encourage or discourage patient; don't offer help but will help when asked.

QUESTION: IN THIS SITUATION, HOW LIKELY WOULD THE PATIENT BE TO CARRY OUT THE TREATMENT PLAN FOR AN INDEFINITE PERIOD OF TIME?

ANSWER: _____

* * * * *

Please turn the page and answer the next 3 questions.

- A. Please spread 100 points between the four kinds of information according to the importance you feel each has had in your judgment of how likely the patient is to carry out the prescribed medical regimen. It may be easier to think of percent, that is, what percent of importance did you place on each type of information?

EXAMPLE: If a person were buying a car, he might be thinking about LOOKS, PERFORMANCE, COST, and DEALER in deciding whether or not to buy the car. If cost were the most important, performance the next most important, and looks and dealer not too important to you, you might spread the 100 points out as follows:

Looks	<u>15</u>
Performance	<u>30</u>
Cost	<u>45</u>
Dealer	<u>10</u>
	100 points or 100%

In your decisions about the likelihood of the patient carrying out the medical regimen, how important was each of these kinds of information?

Convenience _____
 Cost _____
 Severity _____
 Support _____

100 points or 100%

- B. Are there any other important kinds of information you use when thinking about the likelihood of the patient carrying out a treatment plan?

Yes []

No []

If yes, please indicate the importance each has in your judgment by spreading 100 points over the four kinds of information plus the ones you have identified.

Convenience _____
 Cost _____
 Severity _____
 Support _____

Other (Please name)

100 points or 100%

- C. If possible, briefly describe the kind of patient you envisioned in making the judgments for this study.

Thank you very much for
your time and cooperation.

APPENDIX E

APPENDIX E

VALIDATION INSTRUMENT

This study is to examine physicians' and patients' judgments regarding the likelihood of the patient carrying out the prescribed medical regimen. These instruments were designed to provide data to address the following questions:

1. Using cost, support, convenience and severity of illness as variables in the situation, what are the judgments of physicians and patients regarding the likelihood of the patient carrying out the prescribed medical regimen?
2. How much weight do physicians and patients assign to each of the variables cost, support, convenience and severity of illness when making the judgment as to the likelihood of the patient carrying out the prescribed medical regimen?

In your expert judgment, please respond to the following questions by indicating your judgment on the scale provided.

1. Do these instruments seem to measure the judgments of physicians and patients regarding the likelihood of the patient carrying out the prescribed regimen?

1	2	3	4	5
Not at all	Minimally	Adequately (1)*	Very Well (4)	Exceptionally Well

2. How well do these instruments measure the weights physicians and patients assign to the variables cost, support, convenience, and severity of illness when making this judgment?

1	2	3	4	5
Not at all	Minimally	Adequately (2)	Very Well (2)	Exceptionally Well (1)

COMMENTS AND SUGGESTIONS:

NAME:

THANK YOU VERY MUCH

*Number in parentheses refers to the number of judges responding at that point in the scale.

APPENDIX E continued....

The panel of 5 experts validating this instrument were:

1. Georges Bordage, M.D., M.S., Associate Professor.
Office of Medical Education; Laval University School
of Medical Education, Quebec City, Canada.
2. Arthur Elstein, Ph.D., Professor. Office of Medical
Education, Research and Development; Michigan State
University, East Lansing, MI 48824.
3. John B. Molidor, Ph.D., Assistant Dean for Admissions,
Assistant Professor. College of Human Medicine; Michigan
State University, East Lansing, MI 48824.
4. Lee Shulman, Ph.D., Professor. Department of Counseling,
Personnel Services and Educational Psychology; Michigan
State University, East Lansing, MI 48824.
5. Sarah Sprafka, Ph.D., Associate Professor. Office of
Medical Education, Research and Development; Michigan
State University, East Lansing, MI 48824.

APPENDIX F

Aliases*

Calculated for $1/3 \ 3^4$ Fractional Factorial Design

A	=	A^2BCD^2	=	BCD^2
B	=	AB^2CD^2	=	ACD^2
C	=	ABC^2D^2	=	ABD^2
AB	=	$A^2B^2CD^2$	=	CD^2
AB^2	=	A^2CD^2	=	B^2CD^2
AC	=	$A^2BC^2D^2$	=	BD^2
AC^2	=	A^2BD^2	=	BC^2D^2
BC	=	$AB^2C^2D^2$	=	AD^2
BC^2	=	AB^2D^2	=	AC^2D^2
ABC	=	$A^2B^2C^2D^2$	=	D^2
ABC^2	=	$A^2B^2D^2$	=	C^2D^2
AB^2C	=	$A^2C^2D^2$	=	B^2D^2
AB^2C^2	=	A^2D^2	=	$B^2C^2D^2$
I	=	$ABCD^2$		

*Calculated by Dr. William Schmidt, Professor, Department of Counseling, Personnel Services, and Educational Psychology, College of Education, Michigan State University, East Lansing, Michigan 48824.

APPENDIX G

APPENDIX G

Univariate Analysis of Variance Test for
Interactions of Cues across Physician Subjects^a

VARIABLE	HYPOTHESIS MEAN SQ	UNIVARIATE F	P LESS THAN
A1B1	.7111	3.2410	.0823
A1B2	.1815	.6545	.4251
A2B1	.0037	.0147	.9045
A2B2	.0000	.0000	1.0001
A1C1	2.5000	10.2487	.0034
A1C2	.2370	.7511	.3933
A2C1	.2370	1.2283	.2769
A2C2	.2778	.7632	.3896
B1C1	3.6000	9.8628	.0039
B1C2	.2370	.8263	.3709
B2C1	.3704	1.2134	.2798
B2C2	.1778	.8375	.3577
A1B2C1	5.2019	14.4923	.0007
A1B2C2	13.3389	37.4551	.0001
A2B1C1	24.4907	45.7940	.0001
A2B1C2	5.3389	11.1969	.0023
A2B2C1	18.0500	42.6141	.0001
A2B2C2	8.8166	26.4045	.0001

^aDegree of freedom = 1, 29

APPENDIX H

APPENDIX G continued

Univariate Analysis of Variance Test for
Interaction of Cues Across Patient Subjects^a

VARIABLE	HYPOTHESIS MEAN SQ	UNIVARIATE F	P LESS THAN
A1B1	.0151	.0941	.7613
A1B2	.1565	.3971	.5336
A2B1	.8898	3.0866	.0895
A2B2	.0250	.0864	.7710
A1C1	2.1262	7.3554	.0112
A1C2	.3343	1.0941	.3043
A2C1	.0231	.0715	.7912
A2C2	.8028	3.2725	.0809
B1C1	.3160	1.7555	.1956
B1C2	.2370	1.0785	.3077
B2C1	.9482	4.6721	.0391
B2C2	.0444	.1810	.6737
A1B2C1	13.3796	32.6872	.0001
A1B2C2	12.2722	27.7801	.0001
A2B1C1	9.8685	16.9527	.0003
A2B1C2	12.2722	31.4641	.0001
A2B2C1	9.8000	13.0467	.0012
A2B2C2	8.0666	20.0228	.0002

^aDegree of freedom = 1, 29

APPENDIX H

Factors Other Than the Four Cues Identified and Weighted
as Important in Judging Likelihood of a Patient's
Adhering to a Prescribed Regimen

Factors Identified by Patient Subjects (N=16)

1. Physician-Patient Relationship; Trust; Confidence; etc.
[100,50,50,40,30,30,20,20,20,15]*
2. Want More Information
[30,20]
3. How You Feel; You Know Your Body Best
[25,15]
4. Time Allocation
[50]
5. Concern about Taking Any Medications
[10]
6. Common Sense
[10]
7. Side Effects
[10]
8. Functional Disability from Condition that could be Helped
by Regimen
[10]

Factors Identified by Physician Subjects (N=22)

1. Patient's Level of Education and Intelligence
[20,20,12.5,10,10,10,10]
2. Patient's Personality
[30,20,12.5,10]
3. Physician-Patient Relationship
[20,20,12.5,10]
4. Income and Financial Responsibilities
[25,15,10,5,4]

APPENDIX H continued

5. "Patient Education"
[20,12.5,5]
6. Behavioral Aspects
[40,25,6]
7. Symptoms
[20,20,7]
8. Patient Motivation
[60,50]
9. Insight
[10]
10. Reinforcement
[10]
11. Family History
[10]
12. How Affect Significant Others
[5]
13. Social Class
[10]
14. Dependence
[15]
15. Side Effects
[15]

*Numbers in the brackets indicate the weights assigned to that factor by subjects.