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PATIENT PREFERENCES FOR PHYSICIAN COMMUNICATION BEHAVIOR: AN ANALYSIS OF TREATMENT COMPLIANCE STRATEGIES

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A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

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by

H. Dan O'Hair

Norman, Oklahoma 73019

1982

PATIENT PREFERENCES FOR PHYSICIAN COMMUNICATION BEHAVIOR: AN ANALYSIS OF TREATMENT COMPLIANCE STRATEGIES

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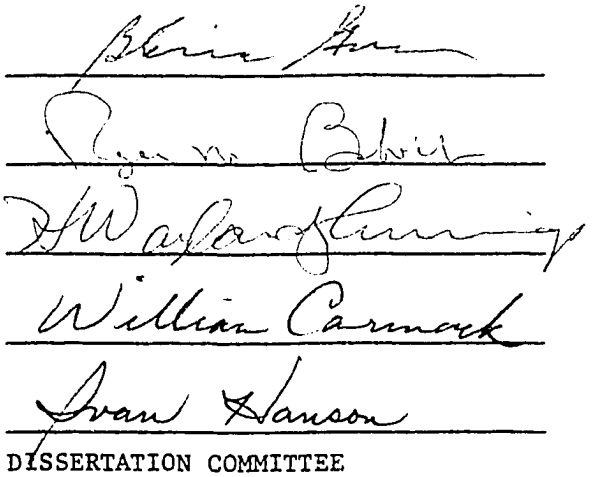

DISSERTATION COMMITTEE

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CHAPTER I

COMPLIANCE MODEL, LITERATURE REVIEW, AND HYPOTHESES

The Problem

Human communication serves as the vehicle whereby individuals influence one another. Humans have a natural proclivity to engage in social influence attempts in order to achieve various goals and rewards, and some individuals are more successful than others in their compliance-gaining attempts.

Undoubtedly, one salient condition in which compliance-gaining attempts occur is in the physician-patient relationship. In many cases, the outcome of care is directly affected by patient compliance with prescribed treatment (Stone, 1979; Becker & Maiman, 1980). Patient compliance has been defined in a number of ways. Sackett (1976) defined compliance as the "extent to which a patient's behavior coincides with the clinical prescription." More recently, Linden (1981) argued that "compliance is patient performance evaluated in terms of therapeutic expectations as given to the patient by his physician." Other terms utilized to depict compliance are: follow-through, fidelity, acceptance, participation, adherence and cooperation (Linden, 1981). For the purposes of this study these definitions are seen as synonymous. Thus, this study views compliance as patient behavior which corresponds with physician recommended instructions. There are, of course, numerous other definitions of

compliance, but the term used in this study refers to the specific situation of the medical setting.

A patient's decision to comply with prescribed regimen is contingent upon many factors, one of which is critical to compliance: the physician's communication behavior. Yet a physician's ability to persuade, or gain compliance from a patient is often unsuccessful. In fact, patient noncompliance rates are astonishingly high. Numerous reports indicate noncompliance rates as high as 30-60 percent (Becker & Maiman, 1980) and some have found noncompliance rates as high as 93 percent (Zisook & Gammon, 1980). Rodin and Janis (1979, p. 60) concluded that patient noncompliance is one of the most serious problems in the health care setting.

The problems associated with noncompliance are multidimensional. First is the patient's health. Patients who do not comply with their physician's prescriptions fail to realize the adverse outcome typically associated with noncompliance. Their recovery is either delayed or obviated when they do not take their pills, fail to adhere to their diet, miss appointments, etc. (Glanz, Kirsch, Rosenstock, 1981; Cassell, Efrid & Burdett, 1975). Furthermore, if noncompliance causes longer hospitalizations, larger numbers of drug prescriptions, and more physician visits, the patient pays for it financially (Cowen, Jim, Boyd & Gee, 1981). Thus, it is important for patients to comply with their physician's treatment requests.

One of the ironies of the patient compliance problem is the low sensitivity of the physician. That is, many physicians are unable to determine noncompliant patients from those who do comply with medical recommen-

dations. For instance, a patient's verbal agreement to follow recommendations can be virtually meaningless. Even early physicians such as Hipprocrates conceded that patients may not comply even when they agree to.

> Twenty centuries ago, Hipprocrates recorded: 'the physician should keep aware of the fact that patients often lie when they state they have taken certain medicines.'
> (Seltzer, Roncari & Garfinkle, 1980, p. 638)

In a study of compliance regarding mothers of sick children, Freemon, Negrete, Davis and Korsch (1971) found that mothers would agree to comply while in the doctor's office, but would default in actual practice.

Much of the research dealings with patient compliance suggests that noncompliant behavior is impossible to predict under most circumstances (Brady, 1980; Marcus, Reeder, Jordan & Seeman, 1980; Stimson, 1974; Schwartz, Wang, Zeitz & Goss, 1962; Maddock, 1967; Porter, 1969). Several studies demonstrate that physicians overestimate the level of compliance of their patients (Stone, 1979; Gillum & Barsky, 1974). One interesting note was reported by Davis (1966) when he found medical students to be better predictors than experienced physicians with regard to patient compliance. He suggests that physicians may be less sensitive to patient perceptions and behaviors than they should be.

A patient's decision to comply with therapeutic regimen is affected by several factors. Many of these factors or variables are intrinsically linked to the communication between patient and physician. Davis (1968), in an interactional study, found noncompliance to be directly related to the communication between doctor and patient. Specifically, patient noncompliance was "explained by increased difficulty of communication, and

attempts by doctors and patients to control each other" (p. 279). Further, the greater the misconceived communication in the interaction, the less likely a patient would adhere to medical prescriptions.

While the term "communication" is employed to explain certain behavioral factors associated with patient noncompliance, few systematic examinations of the communication process are reported. Moreover, the actual content of the communication between physician and patient has been neglected area of study in the examination of noncompliance (Bury & Wood, 1979). Research points out that physicians may utilize persuasive strategies to convince patients of the value of treatment compliance (Gillum & Brasky, 1974; Davis, 1966), yet the dimensions of those strategies or their success rate have not been sufficiently explored. A message analysis of compliance-gaining attempts by physicians would be an important undertaking.

The study of compliance-gaining message strategies in interpersonal communication contexts is relatively new. The emphasis of inquiry is concerned with what is said; or the content of the communication. Miller, Boster, Roloff and Seibold (1977, p. 37) explained the process whereby individuals engage in compliance-gaining strategies:

> . . . people seek to exert communication over certain areas of their social environment (or to purposively affect the behavior of others, or however one wishes to put it), they must select from among a set of symbolic alternatives at their disposal.

Likewise, in the specific communication context involving physicians and their patients, the former must select from among a set of message alternatives to gain compliance from the latter. Importantly, receiver preferences for specific message strategies could be a critical

determinant of actual patient compliance. Therefore, physicians and patients would benefit from a study of these alternatives and their effect upon compliance rates.

Research Purpose

This study intends to examine the effect of compliance-gaining message strategies physicians employ when prescribing treatment regimen for their patients. More specifically, this research will investigate patient preferences for compliance-gaining strategies attempted by physicians. Several questions arise from the exploration of these issues. First, what type of message strategies are preferred by most patients. Second, what effect do pre-existing patient attitudes have upon strategy preference? Third, are there interaction effects between predictor variables in patient selections of preferred physician strategies?

It is the purpose of this study to determine those predictor variables most important to patient compliance and generate hypotheses to determine communication strategies most preferred by patients. The following section will illuminate those compliance variables most important to a communication study of this nature.

Medical Compliance Model

Introduction

The research literature related to patient compliance is voluminous and complex. The implications associated with the failure of patients to adhere to treatment regimen are constantly appearing in the health and behavioral science literature, and it is indeed problematic to

advance encompassing statements regarding patient compliance. For instance, Haynes (1976) reports that two hundred variables were found to be related to medical compliance. Unfortunately, the research findings do not demonstrate consistent trends for many of these variables.

In order to simplify the complexity of the medical compliance situation, a medical compliance model will be presented. A model is useful at this point because, according to Fisher (1978, p. 64), it is:

> an analogy that abstracts or selects parts from the whole, the significant elements or properties or components of that phenomenon that is being modeled. The model then allows the scientist to observe the interactions of these vital elements free from the confounding of the insignificant elements.

The present model represents a conceptualization of the more important compliance variables and the interrelationships which exist for these variables.

The Model

The medical compliance model advanced here is an effort to synthesize and explain those factors most responsible for a patient's decision to comply with medical regimen. The model consists of three primary factors: antecedent, interactional, and outcome variables. The model is an adaptation from a persuasion model advanced by Janis (1959), and is based on the Yale theories of information processing (Hovland, Janis & Kelley, 1953). This perspective is grounded in the learning theory model and while this approach to persuasion or compliance has been termed atheoretical (Smith, 1982), it does provide a description of the compliance process. Hovland *et al.* argued that attitude change is essentially a "learning experience" and for a persuader to induce attitude change,

"it is necessary to create greater incentives for making the new implicit response than for making the old one" (p. 11). The learning of new information, from a patient's perspective, would be necessary for compliance (attitude change) to occur.

According to Smith (1982, p. 215) this conceptualization (model) includes several components which are very compatible to the medical compliance model:

> . . . the effectiveness of information processing in producing new attitudes was dependent, first, on the perceived characteristics of the source of new information. Second, the perceived strength and believability of a message's arguments should affect the success of information processing. Third, channel factors, like the communication setting and the choice of medium, should have a significant impact on the persuasion process. Finally, the receiver's characteristics, such as initial attitudes, levels of ego involvement in the communication topic, and personality traits, were regarded as major factors affecting the adoption of a new attitude.

In the medical compliance model the source would be the physician, the message would involve the physician's message strategy, the communication setting is a physician's office, and receiver characteristics would include the patient variables associated with the delivery of medical care. This model is an effort to describe these various factors or components as they operate within the medical compliance situations. The model is presented in Figure 1.

It is recognized that other models or theories exist which could be employed to explain the patient compliance phenomenon, such as the information integration approach (Anderson, 1971; Fishbein & Ajzen, 1975); cognitive dissonance theory (Festinger, 1957); self-persuasion theory (Bem, 1972); and the social-judgment theory (Sherif & Hovland, 1961).

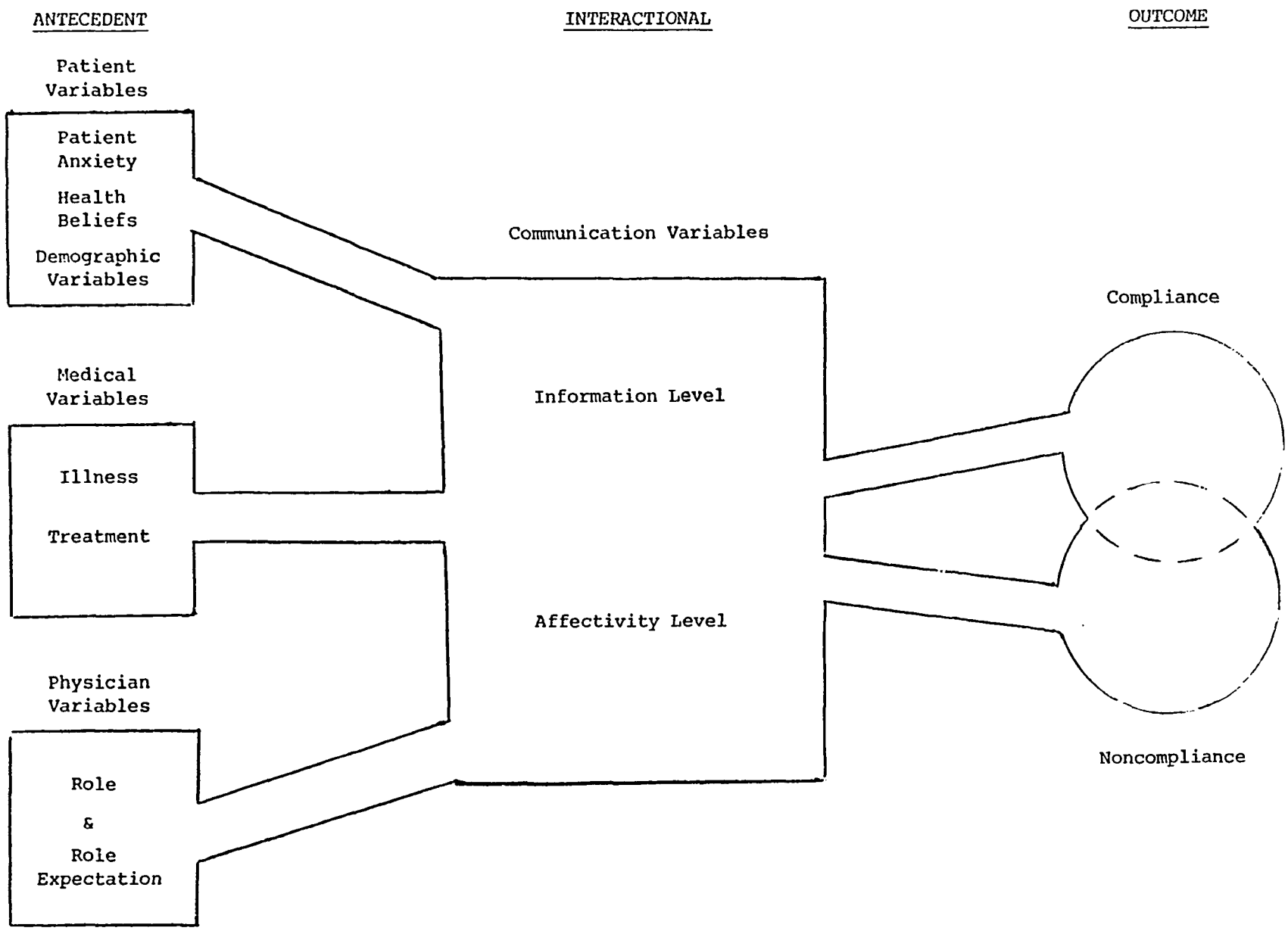
ANTECEDENT
INTERACTIONAL
OUTCOME
Patient Variables
Patient Anxiety
Health Beliefs
Demographic Variables
Medical Variables
Illness
Treatment
Physician Variables
Role
&
Role Expectation
Communication Variables
Information Level
Affectivity Level
Compliance
Noncompliance

Figure 1

However, this model was chosen for several reasons. First, the model is presented merely to explain how various variables associated with medical compliance affect one another in a patient's decision to adhere to treatment recommendations. It is, therefore, a global picture encompassing many variables at once. Second, this model (the Yale approach) is especially useful in "analysis of the effects of a single persuasive communication," (Smith, 1982, p. 249). During treatment instruction episodes, the physician generally will communicate only one message to the patient (Anstett, 1980). Third, this model is especially suited for examination of the physician's message strategy and it's effect upon the patient. This model appears to be best fitted for that purpose (Fisher, 1978).

An inspection of the model demonstrates the centrality of the interaction factor, which constitutes the pivotal element in patient compliance. More specifically, the type and style of communicative interaction between physician and patient can determine, to a large extent, whether a patient will comply with medical prescriptions.

One of the purposes of the model is to graphically present the most salient compliance variables and how they related, therefore only a cursory analysis will be undertaken in this section. The following section, review of the literature, will more fully explore compliance research.

Antecedent Factor

The antecedent factor of medical compliance concerns those variables which are pre-existent to the physician-patient interaction. These variables are typically termed independent or predictor variables and they

can be grouped into three distinct classes: patient variables, medical variables, and physician variables.

Patient variables such as patient anxiety, health beliefs, and demographic characteristics consistently have been reported in the literature. Such personal characteristics of a patient can have a substantial impact upon the interaction with a physician, and consequently the magnitude of the compliant behavior.

Medical variables are the second group intrinsic to the antecedent factor. These variables represent the objective biomedical component of the compliance situation including: (1) the nature of the illness, and (2) the treatment recommendation by the physician. Various types of illnesses require different remedies. Whether a patient experiences chronic or acute illness can determine to some extent the compliant behavior of that patient. While acute illnesses can be severe, they usually last for a short period of time. Chronic illnesses, on the other hand, often last a lifetime. Certainly these variables have an impact on the decision to comply. Likewise, difficult and involved treatment prescriptions such as diets and exercise elicit poorer compliance rates than the taking of oral medication. Thus, medical variables are an important concern for compliance research.

Physician variables are the third group of variables appearing in the antecedent factor. Physician variables consist of those professional and personality attributes a physician brings into the examination room. These variables are probably best explained as the role a physician plays during an interaction with a patient. Several role-models are possible

for a physician to assume and the type a physician chooses can have an impact upon patient compliance.

Interaction Factor

The interaction factor is concerned with those variables intrinsic to the actual communication event in which a physician and patient interact. Variables such as physician-patient communication roles, information exchange, and compliance strategies are part of this factor. This factor is, perhaps, the most important one in the model. This factor, for example, contains those variables which are dynamic and more under the physician's control such as interpersonal communication, rather than variables which are more static and resistant to change such as health beliefs.

Physician-patient communication is a variable consistently regarded by researchers as a determinant of patient compliance. The communication style a physician utilizes with a patient can significantly affect the relationship between the two individuals. The satisfaction of this relationship is reported to be linked to a patient's compliance decisions. One of the communication variables most closely associated with a healthy physician-patient relationship concerns the level of affect demonstrated by the physician's communication. A later section will expand this line of argument.

Information level is another variable associated with patient compliance. A minimum level of information is necessary when physicians prescribe treatment for patients. However, additional information such as explanations and requested patient feedback vary from doctor to

doctor. Moreover, patient preferences for information level may vary among patients, consequently this line of research could be valuable in the study of patient compliance.

Particular studies of message strategies utilized by physicians have been reported. Educational, threatening, and persuasive strategies are those compliance attempts most popular among physicians, and each of these strategies will be discussed within the context of the physician-patient relationship.

Outcome Factor

The outcome factor represents the decision a patient makes concerning compliant behavior. The outcome factor denotes whether a physician was successful in his/her compliance-gaining attempts. As noted by the broken intersecting lines of the outcome factor, compliance and noncompliance can overlap. Full compliance or absolute noncompliance are probably not the norm. Many times a patient will comply with only part of the recommended advice, therefore the overlapped area depicts partial compliance.

The following literature review considers, in more detail, the aspects of the model; especially the more salient compliance variables.

Review of the Literature

Introduction

This section will explore many of the variables associated with medical compliance. Each of the variables contained in the medical compliance model will be discussed. It should be pointed out that many of these variables could be applied to a number of "compliance" or persuasive situations other than the medical setting, and we know that there is a vast amount of literature which has dealt with these issues. It is argued, however, that the doctor-patient relationship is unique (Cassata, 1980, Engel, 1977), and as such, much of the previous literature (concerning these variables) does not apply specifically to this unique situation. Consequently, the following review is presented to review the specific literature regarding patient compliance.

Patient Variables

Patient Anxiety

A visit to the hospital or the physician's office may evoke anxiety in a patient. If the visit is in response to an illness which seems serious or is unrecognizable to the patient, apprehension may exist causing a strain on the interaction between patient and physician. Stone (1979, p. 41) characterized noncompliant variables which stem from unconscious factors in patients as psychodynamic interpretations. Variables associated with this theory, which include anxiety (Ley & Spelman, 1967) and unconscious conflicts (Applebaum, 1975), are reported to cause active resistence to medical compliance. Specifically, Ley and Spelman found

low and high anxiety levels in patients (measured by Cattell's 12 Personality Factor Questionnaire) to be more detrimental to a patient's recall of physician instructions than a moderate level of anxiety. Marston (1970) reported a study by Cobb et al. which indicated that those patients complying with medical regimen were also those who could control their anxieties associated with the illness.

In contrast, Hellmuth et al. (1966), utilizing the Minnesota Multiphasic Personality Inventory, found patient anxiety level to be unrelated to distortion of medical recommendations by cardiac patients. Podell (1975), in his comprehensive review of compliance, also found anxiety level as a predictor of compliance demonstrated little consistency between studies (Ozuna, 1981). It is difficult, at this point, to confidently argue that patient anxiety is a valid predictor of compliance, but anxiety may distort patient recall of instructions or may even taint the attitudinal disposition of the patient concerning health beliefs.

It may be that patients who have an anxiety "trait" (individuals anxious in many situations) may be those who also have problems with the communicative episodes with their physicians, and subsequently, problems complying with recommended treatment. The issue of trait-state anxiety has been raised often (Spielberger, 1966; Spielberger, Gorsuch & Lushene, 1968; Zuckerman, 1976), but not within the patient compliance context. It would be valuable to determine if patient anxiety is peculiar to the "setting" (medical delivery), or if patients who experience anxiety do so across many situations. Future research should address this issue in more detail.

Health Beliefs

The beliefs a patient holds toward certain health factors or variables can have an important impact upon compliant behavior. To this point, Seibold and Ruper (1979, p. 625) wrote:

> Health and illness behaviors are a function of a person's attitudes and beliefs, and the effects of these psychological characteristics on the individual's motivation to act in health-conscious ways.

Hochbaum (1958), through the influence of Kurt Lewin's theories, introduced a cognitive learning model to understand the health beliefs and motives of individuals (Stone, 1979). His concern centered on the general beliefs of individuals toward health and illness. More recently, Becker and his associates (Becker, 1974; Becker & Maiman, 1975; Becker & Maiman, 1980) conducted exploratory research and proposed a health belief model to explain general health intentions and predispositions of an individual, and applied the model specifically to treatment compliance. In essence, the Health Belief Model (Becker & Maiman, 1980, p. 119) proposed that patient compliance is dependent upon four factors:

> (1) health motivation: degree of interest in, and concern about, health matters in general; (2) susceptibility: perceptions of vulnerability (or resusceptibility) to the particular illness (or to its sequelae), including acceptance of the diagnosis; (3) severity: perceptions concerning the probable seriousness of the consequences, on both physical and social dimensions, of contracting the illness or of leaving it untreated; and (4) benefits and costs: an evaluation of how effective the advocated health behavior might be in preventing or treating the condition, weighed against an estimate of what barriers might be involved in undertaking the recommended action (e.g., financial expense, physical and/or emotional discomfort, inconvenience, possibility of adverse side effects).

Becker and Maiman (1980) argue that isolating those factors (or beliefs) which are insufficient for compliance (vis-a-vis the Health

Belief Model) can lead to intervention strategies by the physician which may improve compliance. Seibold and Roper (1979) have suggested the same strategy by employing the Triandis Theory of Social Behavior and Fishbein's Theory of Behavioral Intentions.

Demographic/Social Characteristics

Studies examining particular social or demographic patient characteristics like sex, age, socioeconomic status, marital status, education level, and race are abundant. Unfortunately, they do not seem to be consistently related to compliance (Davis, 1966; Kirscht & Rosenstock, 1979).

Gender appears to have little effect upon the compliance level of patients. While some research reported females to demonstrate poorer compliance than males (Dixon, Stradling & Wooton, 1957; Luntz & Austin, 1960), other research indicates the opposite to be true (Rosenstock, 1974; Marcus, Reeder, Jordan & Seeman, 1980). For the most part, the relationship between sex and compliance is inconclusive (Maddock, 1967; Neeley & Patrick, 1968; Davis, 1968).

Conflicting data have been accumulated with regard to the relationship between age and medical compliance. Early research showed younger patients complied with regimen better than older patients (Cobb, Clark, McGuire & Howe, 1954; Schwartz, Wang, Zeitz & Goss, 1962), but more recent research suggests that older patients may be better compliers (Hurtado, Greelick & Columbo, 1973; Marcus, Reeder, Jordan & Seeman, 1980). As with sex, a considerable amount of research demonstrates no significant relationship to exist between age and compliance rates (Maddock, 1967; Roth & Berger, 1960; Davis, 1967; Davis, 1968, Hulka,

Cassel & Kupper, 1976; Kirscht & Rosenstock, 1979). Based on the above compliance research, age seems to play a small part, if any, in the compliance picture.

There are inconsistent findings in studies where socio-economic status is examined as a predictor variable in relation to compliance behavior. After reviewing a number of studies, Kirscht and Rosenstock (1979, p. 199) concluded that compliance "is not consistently related to socio-economic level." In some instances, lower socio-economic status was associated with increased levels of noncompliance (Donabedian & Rosenfeld, 1964; Caldwell, Cobb, Dowling & Jongh, 1970). Income level, however, demonstrated an inverse relationship with compliance rates in another study (Marcus, et al., 1980). Socio-economic status and income level are not necessarily parallel, but no matter how status is measured, no relationship between socio-economic status and compliance seems to exist (Patrick, 1963; Heinzelman, 1962).

Marital status as a factor in patient compliance was of interest to several researchers. Consistent with the demographic variables previously discussed, no consistent relationships exist between marital status and adherence to treatment requests (Neeley & Patrick, 1968; Patrick, 1963). Only one study reported a relationship; married patients were more likely to follow medical advice than were single patients (Morrow & Rabin, 1966).

Surprisingly, little association has been established between education level and compliance (Becker, Drachman & Dirscht, 1972; Hulka, Cassel & Kupper, 1976; Kirscht & Rosenstock, 1979). Relationships existing between education level and compliance are mixed. Davis and Eichhorn

(1963) discovered noncompliant behavior to increase as education level increased, while Davis (1968) reported education level to have a positive correlation with treatment compliance. Again, this demographic variable is a weak factor explaining patient compliance.

A final demographic variable previously studied as a predictor of compliance concerns the race of a patient. These efforts uncovered no association between racial characteristics and a patient's willingness to follow medical recommendations (Neeley & Patrick, 1968; Morrow & Rabin, 1966; Patrick, 1963).

The patient variables discussed in this section represent the most visible dimensions of patient characteristics which were suspected of affecting compliance rates. Patient anxiety and health beliefs appear to be the better predictors of patient compliance, while demographic characteristics fail to demonstrate consistent relationships with a patient's decision to comply with physicial recommendations.

Medical Variables

Nature of the Illness

The type of illness can determine in large part the rate of compliance associated with prescribed treatment. For purposes of simplification, two general illness categories will be employed to explain compliance differences: acute and chronic illness.

There seems to be general agreement that acute illnesses elicit the highest rates of compliance (Stone, 1979; Charney, 1972) and chronic illnesses are associated with lower rates (Zisook & Gammon, 1980-81; Stone, 1979). These differences are quite logical. Acute illnesses produce symptoms which are short-term when treated properly. Chronic illnesses,

on the other hand, enslave a patient to symptoms and treatment for long periods of time, often for a life-time.

Nature of the Treatment

While acute illness evokes better compliance than chronic illness, it is not without its own problems. When the symptoms of an illness disappear, many patients will discontinue use of their therapeutic regimen (Baekeland & Lundwall, 1975; Strain, 1978; Becker, Drachman & Kirscht, 1972; Mohler, Wallin & Dreyfus, 1955; Stone, 1979). In the Mohler et al. study, symptom remission was the most common reason for failure to fully complete treatment recommendations. Yet, in most cases, complete adherence to prescribed treatment is necessary for complete and speedy restoration of health.

Chronic treatment has significant problems of its own. First, the treatment for chronic illness is generally lengthy. Studies revealed that duration of illness and treatment have an adverse effect upon complaint behavior (Baekland & Lundwall, 1975; Haynes, 1976). Additionally, the more complex the treatment regimen, the more likely adherence will decline (Blackwell, 1973; Latiolais & Berry, 1969; Hulka, Cassel, Kupper & Burdett, 1976).

The type of treatment regimen prescribed has a profound impact upon compliance. Specifically, "regimens requiring alteration or omission of personal habits (smoking, drinking, eating) are less likely to be followed than regimens requiring addition of new behaviors (taking pills, exercising," (Ozuna, 1981, p. 1). Other research similarly demonstrated low compliance with recommendations to modify habitual behaviors (McAlister,

behaviors (McAlister, Farquhar, Thoresen & Maccoby, 1976).

The literature concerning illness and treatment variables appears clear; while acute illness and treatment elicit less than full compliance from patients, compliance is much lower with chronic disease and treatment.

Physician Variables

The roles which physicians and patients assume when they interact determine, to a large degree, the type of communication each will employ in the interaction. It is a common assumption that conflicting roles, or role violations can cause a strain on a relationship and the physician-patient relationship is no exception. This section will examine two of the more visible aspects of the roles and role expectations involved in this relationship: (1) role of authority and (2) social-technical roles.

Role of Authority

The authority a physician wields over patients has long been the subject of discussion for medical scholars. Authority is defined as, "power to influence or command thought, opinion, or behavior," (Woolf, 1975, p. 76). Perhaps, most characteristic of physician authority is the superior-subordinate role model advanced by Friedman and DiMatteo (1979, p. 4). They explain the conditions involved with this model:

> . . . aspects of the practitioner-patient relationship may be viewed as an attempt by one person (the practitioner), who is an independent, powerful expert, to change the attitudes and behaviors of another person (the patient), who is a lower status, dependent, ignorant recipient of the communication.

This model depicts an unflattering view of physician behavior, yet

research points out that this role model has a long history. Hippocrates in the fourth century B.C., for example, argued for physician authority which included concern for the patient and his/her disposition (DiMatteo, 1979). More recent reports argue that as a relationship between physician and patient becomes less formal, patient noncompliance becomes greater (Davis & Eichhorn, 1963). Davis contended that formal physician authority is necessary to assure patient acceptance of treatment advice. According to Davis, authority begets respect.

More recent accounts indicate that physician authority is being increasingly challenged by patients (Robbins, Kauss, Heirich, Abrass, Dreyer & Clyman, 1979; Twerski, 1979; Blughagen, 1979; Haug & Lavin, 1979). Patients report relationship strain due to formal physician authority and reject it for a more equal role relationship. Physician recognition of this problem, in some cases, will cause a backlash effect. For instance, Stiles, Putnam, James and Wolf (1979) reported that doctors will withhold medical information in order to maintain authority over a patient. While formal physician authority impacts upon the communication between the two parties, it is unclear what the general effects of authority have upon patient compliance.

Social-Technical Roles

Related to a discussion of the role of authority by a physician is the social-technical roles which a physician can assume. Young (1980, p. 280), defines these roles and explains how they are represented:

> Within the doctor-patient problem-solving dyad, the technical component is represented by the knowledge of how to examine and diagnose the physiological symptoms and, subsequently,

> how to treat the ailment effectively. The social component is represented by how facilitative the physician is at getting the patient to cooperate or participate in the problem-solving process by contributing important information during the diagnosis. Quite often this social conpetence is relfected in how "concerned" and "easy to talk with" the physician is.

It was argued that the most effective role a physician could assume when interacting with patients is a blend of social and technical skills. Each of the skills fulfill different functions. Technical skills perform functions related to biomedical and physiological concerns, and social skills perform functions which correspond to psychosocial and communication concerns.

Some interesting implications emerge from the social-technical role model. First, DiMatteo and Hays (1980) found patients to judge their physician's technical competence based on their communication skills. Ben-Sira (1976) obtained similar results with regard to a physician's affective behavior. In a review by DiMatteo, Prince and Taranta (1979, p. 280), several studies reported patients basing their judgments of perceived physician competence on the "socioemotional dimensions of the physician-patient relationship." The ramifications of a balanced socioemotional physician role will be more fully elaborated upon later.

Physician variables include those role alternatives which are available to a physician when interacting with a patient. The role of authority, if played as a superior-subordinate role model, may alienate a patient and cause relational strain. A balance of social and technical roles may provide an optimal role model for establishing and maintaining

a satisfactory interpersonal relationship between a patient and their physician.

Communication Variables

The interaction which occurs between patients and their physicians is one of the more studied variables of medical noncompliance. Several behavioral dimensions emerge as explicative factors of patient noncompliance. As the model points out, there is one general area of interaction variables embedded in the factor: communication variables. More specifically, two categories of communication variables surface as most salient to not only patient satisfaction, but also to patient compliance, that is, information level and the level of communicative affectivity. Specific physician compliance strategies will also be discussed.

In order to fully examine the relationship between communication and patient compliance, a preliminary discussion of the interpersonal relationship between the physician and the patient would be appropriate.

The communicative relationship between physician and patient is an important variable to consider when examining patient compliance. In fact, a number of studies conclude that the physician-patient relationship is the most consistent variable associated with medical compliance (Ley & Spelman, 1967; Francis, Korsch & Morris, 1969; Waitzken & Stoeckle, 1972; Toledo, Hughes & Sims, 1979; Stone, 1979). Of course, the cornerstone to a healthy relationship is the establishment and maintenance of effective relational communication (Fitzpatrick & Best, 1979; Miller & Rogers, 1976). Further, the better the interpersonal relationship, the better the compliance (Talkington, 1978); the poorer the physician-patient

relationship, the worse the compliance (Gillum & Barsky, 1974; DiMatteo & Hays, 1980). There are numerous factors involved in a relationship of this type, one of which is a patient's perception of the satisfaction experienced in the relationship with a physician. In general, patients appear discontent with this relationship. For instance, Engel (1979) reported that many patients express dissatisfaction with their relationship with a physician; and Koos (1955) found the greatest patient criticism of the medical care they received was the nature of the physician-patient relationship. More recent reports lend support to this claim (Smith, 1979). The following sections specify those dimensions most responsible for communication effectiveness and relational satisfaction.

As noted previously, patients who are dissatisfied with the relationship they experience with their own physician comply with treatment requests less often than satisfied patients. The nature of the communication styles and patterns greatly impact upon the relationship perceptions of patients and consequently compliance. Specifically, effective physician-patient communication can positively affect adherence to medical regimen (Daly & Hulka; DiMatteo, 1979), while noncompliance is a clear index of poor physician communication (Gillum & Barsky, 1974). Walker (1973, p. 356) contends that poor communication and noncompliance produce a "negative cyclical pattern"; poor communication causes noncompliance and physician recognition of noncompliance gives rise tc a strained communicative relationship.

Thus far, the concept of communication has been employed in a very generic manner. Stone (1979), conversely, broke down physician-patient communication into two separate functions: information dissemination

and emotional communication. DiMatteo and Hays (1980), likewise, have underscored the importance of socioemotional forms of communication. This type of communication, presently termed affective, is the subject of the next section.

Affective Communication

Affective communication is defined as those communication efforts which reflect affect, warmth, empathy, friendliness, concern, and awareness of patient's concerns, both medical and psychosocial. Affective communication may not even include medical talk.

Patient preference for affective physician communication seems to vary. In 1963, Davis and Eichhorn conducted a survey to determine patient preferences toward physician-patient relationship styles, and the results suggested a majority of patients preferred a formal relationship with their doctor. Furthermore, the study concluded, "the formal relationship serves to elicit more continued compliance than informal ones," (1963, p. 248). It is important to note the date of this study. Subsequent research efforts (especially recent studies) no longer reflect this patient attitude. Patients today, not only prefer, but expect a physician to utilize less formal and more personal styles of communication (Eisenberg, 1977).

One of the components essential to affective communication involves empathy. The empathy shown by a physician is crucial to the successful development of the physician-patient relationship (Carek, 1978; Gross, 1979; Hartson & Hartson, 1980). To operationalize this communication variable, the American Board of Internal Medicine reported those inter-

personal skills necessary for a physician to provide empathic care for patients (Duffy, Hamerman & Cohen, 1980, p. 356):

> . . . develop a strong relationship that inspires confidence in patients and conveys a feeling of interest and concern; communicate to patients and patients' families information about diagnosis, prognosis, and management; interact in a nonjudgmental manner; be alert to and interpret nonverbal clues from the patient; recognize and be attentive to the patient's emotional needs and recognize their potential influence on the symptoms and course of the illness.

In addition to a physician's empathic behavior, friendliness is a critical ingredient of communication by doctors. Research indicates that a positive relationship exists between physician friendliness and patient satisfaction (Korsch, Freemon & Negrete, 1971; Freemon, Negrete, Davis & Korsch, 1971). Patients appear to "open up" when a physician demonstrates a friendly attitude within the interaction. As patients become more communicative, satisfaction with the relationship is enhanced.

Too often, when patients enter a doctor's office they conceal their expectations and desires regarding physician conduct and medical care in general. It is therefore crucial for a physician to ascertain the nature of the patient's perceptions (Liptak, Hylka & Cassel, 1977; Stewart, McWhinney & Buck, 1979), especially since "compatibility of patient's desire and physician's performance has an important influence on the success of the relationship" (DiMatteo & Hays, 1980, p. 32). Young (1980) noted that patients should become involved in the problem-solving process of medical treatment. In this way a patient's desires will become manifest, providing the physician with perceptual information necessary for satisfactory relationship development. A specific strategy to encourage patient participation in the physician-patient interaction involves the

employment of feedback. Eliciting feedback from patients will involve them in the diagnostic and treatment process and can greatly enhance a physician's success in gaining compliance from patients (Rodin & Janis, 1979; Schaim, 1980).

Taken together, the various affective communication variables when applied properly can lead to increased patient satisfaction and can positively affect compliance (Schain, 1980; Milmoe, Rosenthal, Beane, Chafetz & Wolf, 1967). The absence of these variables can lead to dissatisfaction and noncompliant behavior by the patient, especially the elderly (Nuttbrock & Kosberg, 1980).

Information Exchange

The information exchange between a physician and a patient can be conceptualized as involving three different elements: (1) quantity of physician information, (2) comprehension of the information, and (3) recall of the information. The relationship between these variables and patient compliance behavior will be discussed.

Quantity of information. The amount of information disseminated to a patient by a physician can vary greatly depending upon the situation. Some doctors may divulge great quantities of medical information, while others may restrict their utterances to a bare minimum. The situation becomes problematic when a patient desires more information than the physician is willing to allow. Unfortunately, this may be the case in many instances. Despite a patient's desire to be fully informed of the intricacies and details of medical care (Westcott, 1980; Almy, 1980), many of them are grossly uninformed (Anstett, 1980; Dunklem, 1979).

The research surrounding the relationship between quantity of medical information given to patients by their physician and patient compliance demonstrates inconsistent findings: high and low levels of physicians information are associated with patient noncompliance. For example, several reports argue that increased levels of physician information is only weakly related to a patient's adherence (Blackwell, 1972; Finnerty, Mattie & Finnerty, 1973; Lock, 1979). Seltzer, Roncari and Garfinkel (1980) compiled several studies and concluded that noncompliance is directly related to a patient's lack of knowledge. More specific research bears out the latter's claim. For instance, the failure of the physician to explain the purpose of the treatment can cause noncompliance (Stimson, 1974; Rodin & Janis, 1979). In a study of pediatric care, the amount of information given to a mother regarding the care of her child directly related to parental satisfaction with the office visit, and in turn increased compliance with medical regimen (Freemon, Negrete, Davis & Korsch, 1971). Mothers in this study wanted to know such things as the scientific name of the illness and what brought on the sickness.

It would appear that patient satisfaction and subsequent patient compliance is related to some degree to higher levels of information. The exact level of information optimal for patient compliance is difficult to determine. At some point, information overload may occur and comprehension will suffer. That is the topic of the next section.

Comprehension of information. The amount of information communicated by a physician is meaningless unless the patient comprehends the message. Patient comprehension is a function of the communicative success between

physician and patient. To substantiate, numerous accounts have extolled the virtues of effective communication regarding physician information, patient comprehension, and medical compliance (Malahy, 1966; Watkins, Williams, Martin, Hogan & Anderson, 1967; Westacott, 1980; Watkins, Roberts, Williams, Martin & Coyle, 1967; Hulka, Cassel, Kupper & Burdett, 1976). The evidence suggests the more a patient knows and understands about the illness and its treatment, the better the compliance with treatment requests.

Despite a physician's effort toward informing patients about their illnesses and the necessary treatment, patients feel physicians do a poor job in this type of communication (Charney, 1972; Gerrard, Boniface & Love, 1980). More specifically, the extent of patient misunderstanding varies from nineteen percent (Mohler, Wallin & Dreyfus, 1955) to fifty percent and above (Boyd, Covington, Stanaszek & Cousson, 1974; Snyder, Lynch, Derogatis & Gruss, 1980). According to Blackwell (1979), patient understanding is the most important contribution to compliance. Therefore, physicians should strive for clarity in their communication and become sensitive to potential patient misunderstanding, especially since Charney (1972) found that physicians underestimate what their patients understand.

One of the major patient complaints about physician-communicated information involves the utilization of medical jargon. Several studies demonstrate that when medical jargon is employed by physicians, the comprehension rate of the patient is low. (Korsch, Freemon & Negrete, 1971; Charney, 1972; Walker, 1973; Roe, 1979; Pilowsky, 1980). Perhaps, definitions, descriptions, or explanations should accompany scientific

terms when used in a physician-patient interaction.

Recall of information. Remembering what a doctor prescribed is one of the last steps before actual compliance occurs. Regrettably, actual patient recall of prescribed treatment is poor (Becker & Maiman, 1980). This problem was further illustrated by Svorstad (1976) when half of the patients she studied made at least one error when recalling their physician's prescriptions.

Information overload is cited as the primary culprit for insufficient and inaccurate recall of medical instructions (Page, Verstraete, Robb & Etzwiler, 1981). This study has suggested that patients should be given only a limited number of recommendations "in order to maximize the probability that the most important recommendations are communicated and remembered" (p. 98). Ley and Spelman (1967) support the information overload contention and propose that patients write down what a doctor tells them for later recall.

The Ley and Spelman study was interesting in that several ubiquitous tendencies appeared regarding patient recall. First, patients remembered best what they considered most important. Second, individuals with good medical knowledge had better recall than those with less knowledge. Third, patients remembered initial information better than subsequent information. In this case, patients may be experiencing proactive interference, that is, "the loss of information because of the presence in memory of similar information acquired earlier," (Craig, 1979).

One final note should be made regarding recall of information and medical compliance. The Svarstad study (1976) uncovered an important result: patients who had total recall of doctor's orders complied three

times more than those with poor recall.

> To conclude, the bulk of the evidence associated with physician--patient information exchange indicates that: (1) the quantity of physician information must be appropriate for the patient, (2) comprehension of the information by the patient must be accomplished, and (3) recall of the information by the patient must occur at high levels. The exclusion of any of these actions could obviate patient compliance.

Physician Compliance Strategies

During the interaction between physician and patient, the former will recommend certain actions which the latter is expected to follow. As the previous research points out, patient compliance is not guaranteed. As Stimson (1974, p. 100) observed, "a patient is a decision-making individual living in a culture from which he is receiving information about health and illness." Given the fact patients make a choice between compliance and noncompliance, strategies should be studied which could enhance the probability of compliance. Several physician compliance strategies are reported in the literature. Those strategies most pertinent to the physician-patient interaction include education, fear and threat, and nonthreatening persuasive strategies.

Education strategies. Physicians attempt to increase compliance among patients by educating them about their illness and appropriate treatment. These strategies are more informative than persuasive and tend to divulge many details to the patients. Educational efforts directed toward improving compliance among patients has received considerable attention and the overwhelming conclusion is that educational strategies are ineffective in eliciting increased adherence by patients. Tagliacozzo and his associates (Tagliacozzo & Ima, 1970; Tagliacozzo,

Luskin & Lashoff, 1974) were unable to increase compliance through educational efforts. Several studies report educational strategies to be ineffective in increasing compliance among hypertension patients (Sackett, Haynes, Gibson, Hackett, Taylor, Roberts & Johnson, 1975; McKenney, Slining, Henderson, Devins & Barr, 1973; Tanner & Noury, 1981; Webb, 1980) as well as among diabetic patients (Page, Verstraete, Robb & Eizwiler, 1981). Thus, while educational strategies may be a necessary condition for patient compliance, they appear to be an insufficient inducement for complete compliance.

Fear strategies. Fear arousal appears to be a popular compliance technique employed by physicians (Mathews & Hingson, 1977). Fear strategies may be defined as verbal techniques which attempt to make patients so frightened of not cooperating that they will rigidly comply with medical direction (Ley & Spelman, 1967). Despite its prevalence, fear tactics are not consistently successful in scaring patients to comply with therapeutic regimen (Leventhal, 1965; Higbee, 1969). Mathews and Hingson (1977, p. 885) have explained the shortcomings of fear appeal strategies:

> Patients exposed to a fear arousal message may perceive the threatened outcome as improbable, inapplicable, unimportant, or remote in time. Patients advised, for example, to stop smoking because of its adverse health consequences can and do deny or rationalize the advise away. Moreover, even if a fear appeal succeeds in arousing sufficient anxiety, it may fail to produce the intended behavioral change because the physician's recommendation may not be regarded as very effective.

To further emphasize, Ley and Spelman (1967) reported a study where three levels of fear arousal were communicated to patients by their physician. The most effective strategy was the minimum fear group, followed by the

moderate fear group, with the strongest fear arousal strategy being the most ineffective. Much of the research concerned with fear tactics utilized role-playing subjects and few field observations of this strategy are reported. The literature is clear, however; fear arousal is an unsuccessful compliance-gaining strategy.

Persuasive strategies. Persuasion was defined by Fotheringham (1966) as "that body of effects in receivers, relevant and instrumental to source-desired goals, brought about by a process in which messages have been a major determinant of those effects" (p. 23). Medical compliance scholars define persuasion as "rational argument," (Gillum & Barsky, 1974, p. 1563). Intuitively, persuasive strategies would appear to be the optimal choice for physician utilization, since they are stronger messages than educational strategies and less offensive than fear arousal strategies.

Davis (1966), in a vernacular fashion, argued for persuasive strategies as the ultimate means to gain compliance from patients. However, the nature of these persuasive strategies has yet to be determined. No studies exist which systematically and empirically study persuasive compliance-gaining message strategies. Further, there is a dearth of information regarding patient preference for one type of persuasive strategy over another. Until physicians become knowledgable for the more effective types of message strategies to induce patient compliance, the rates of adherence to medical regimen will probably remain dismally low.

Conclusion

The previous review characterized the bulk of the medical compliance literature available. The number of variables presented were restricted to those which emerged as most salient and pertinent to a behavioral science inquiry.

The compliance model is communication-oriented, rather than medically oriented. The physician-patient interaction is the factor which could alter those variables influencing a patient's decision to comply with treatment, either positively or negatively. One of the problems associated with the interaction factor is the paucity of experimental research studying the relationship between communication and compliance. Almost all of the existing research was conducted by medical researchers with little background in communication theory. Given the magnitude of the compliance problem, it is not surprising that Stone (1979) and Barnlund (1976) have voiced appeals for communication scholars to become involved in compliance research.

The number of compliance variables are too large to study concurrently. Instead, this study will isolate variables from the model most conducive to communication research. The following section will outline those variables and propose hypotheses to explain a portion of the compliance situation.

Rationale and Hypotheses

Intervention strategies employed by physicians are a prime source of research inquiry due to their adaptable characteristic. Physicians can always change the type of message strategy to gain compliance from

patients. It is, therefore, important to determine which strategies are preferred by patients. Obviously, patients are the ultimate determinants of compliance, and patient preferences for certain strategies would reveal important information to the health profession. Therefore, the ultimate goal of this research is to identify those communication strategies employed by physicians which are most appealing to patients.

It would also be important to know what effects certain predictor variables would have upon the type of physician-communicated strategies preferred by patients. Knowing particular characteristics about patients and preferences associated with those characteristics could inform a physician as to which message strategy would be optimal for this particular patient. The medical compliance model illuminated numerous salient variables associated with a patient's decision to comply with medical regimen. It is beyond the capability of this research to examine each of the compliance variables and/or their interaction with one another. Instead, those variables which are most pertinent to the communication between patient and physician will be examined.

Patient Variables

As mentioned earlier, patient anxiety is associated with low compliance rates. It is not known whether the anxiety experienced by the patient distorts the information disseminated by the physician during an interaction. At this point, it is also unclear whether the anxiety of a patient is experienced only in a medical setting (state) or whether the anxiety is manifest in many situations (trait). Further, patient anxiety may be a reflection of a particular type of communication anxiety termed,

receiver apprehension. Receiver apprehension involves the anxiety a communicator experiences when receiving information. Wheeless (1975) developed a test to index the level of receiver apprehension an individual experiences. It is termed the Receiver Apprehension Test (RAT). It is generally assumed to be a trait measure (i.e., scoring high on the measure indicates receiver apprehension in many situations) and demonstrates good reliability and validity. A high score on the RAT indicates apprehension toward receiving information in large quantities in a short period of time. Beatty, Behnke and Henderson (1980) successfully replicated these results. Their study, however, did indicate that the RAT may be able to test for receiver apprehension associated with general situations:

> . . . the finding of a moderate correlation between the RAT and the STAI (A-Trait) suggests that the RAT is a respectable measure of the subjects' tendencies to respond anxiously in listening situations that require complex information processing or psychological adjustment to messages.

Given the jargonistic and technical language employed by physicians in their communication with patients, this measure appears to be highly appropriate for a study of the information receiving preferences and abilities of patients. Receiver apprehension, therefore, could prove to be an important predictor variable in the study of patient compliance.

A person's health beliefs is another variable important to medical compliance. Individuals who are positively predisposed toward diagnostic and therapeutic intervention would demonstrate better compliance rates (Becker & Maiman, 1980). It would be valuable to know what type of message strategies low-compliers prefer during the physician-patient

interaction. The health belief model has been constructed to determine an individual's proclivity toward compliance. Scores on this measure could help determine, beforehand, the compliance tendencies of a patient.

Physician Variables

As the review of literature demonstrates, two communication variables emerge as most significant: the affective nature of the physician's communication and the level of information disseminated to the patient. Much of the recent literature observed that patients, in general, prefer a physician who communicates a high level of affectivity, yet, older evidence purports the opposite to be true. It would be important to know, given the choice, if affective physician strategies are preferred over neutral strategies by most patients.

Recent reports argued that a patient will prefer prescriptive strategies which contain large amounts of information. However, if only portions of the patient population indicate preferences for a high level of information, knowing which patients prefer low levels of information would provide beneficial insight to a physician. The same would be true for patients preferring high levels of information. Therefore, identification of patient groups preferring high and low levels of information should be a significant communication research issue.

Hypotheses

Since the goal of this research is to determine those message strategies most preferred by various groups of patients, specific hypotheses will be advanced to ascertain the nature of the communication involved in patient compliance.

Preferences for physician communication strategies have not been studied systematically and empirically in previous research. Moreover, predictor variables associated with preferences for physician message strategies seldom have been tested. Research in this area is needed. A first step toward addressing these concerns would involve an examination of general preferences for message strategies. If differences in preference for certain strategies exists among subjects, further exploration of predictor or independent variables which might explain these differences would be appropriate. Therefore, global differences in strategy preferences will be conducted initially.

There are two important variables which could determine patient compliance behavior: quantity of information and affective communication. If patient desires for information and affective communication are strong, a combination of these two variables could produce even better compliance among patients. The review of the previous literature concerning potential differences in patient preferences for these communication components or qualities provides a justification for the following question. Would patients show their strongest preference for strategies which are both high in affectivity and high in information? This question leads to the following prediction.

H_1: There will be a significant difference in subjects' preferences for the types of physician message strategies.

Receiver apprehension indicates that an individual will experience anxiety when given large amounts of information in a short period of time. Individuals scoring low in receiver apprehension do not experience the

same anxiety. A question at this point would be: do individuals scoring high and low in receiver apprehension differ in their preferences for information? In response, the following prediction is advanced.

H_2: High receiver apprehensive subjects will prefer different message strategies than low apprehensive subjects.

The health beliefs a patient holds is an effective predictor of patient compliance (Becker, Maiman, Kirscht, Haefner & Drachman, 1979). It would seem plausible that individuals scoring high on the health belief test (high-compliers) would prefer messages high in information since they are health-conscious and tend to value medical and physician advice. In addition, high-compliers may also prefer strategies which are high in affectivity since they report that they have good rapport with their physician. One might ask the question: do individuals scoring high versus low on the health belief test differ in their preferences for the various types of physician message strategies? The following hypothesis addresses this concern.

H_3: High health belief subjects will prefer different message strategies than low health belief subjects.

Given the different patient variables and their potential effect upon compliance, one may ask the question: Is there an interaction effect between patient predictor (dependent) variables (receiver apprehension and health beliefs) such that differences between (levels of) patient groups cause differences in preferences for physician message strategies? For instance, it is expected that high receiver apprehensive,

high health belief subjects will differ from low apprehensive, low health belief subjects in their preferences for the types of physician message strategies.

The subsequent prediction is in response to this issue.

H_4: The interaction between health beliefs and receiver apprehension will produce differences in subjects preferences for the types of message strategies.

CHAPTER II

METHOD OF ANALYSIS

Subjects

Three hundred and three subjects participated in the study. Of these subjects, 134 participated in the waiting room of their physician's office or clinic and 169 participated at their place of work during regular hours. Five sites were utilized for in-clinic data collection: (1) a small, private, fee-for-service, hospital/clinic with five physicians attending the clinic, located in a medium-size, rural city in West Texas; (2) a large, private, fee-for-service hospital/clinic with one physician in attendence, located in a medium-size, rural city in West Texas; (3) a small, private, fee-for-service hospital/clinic with four physicians attending, located in a medium-size, rural city in West Texas; (4) a public, large state university, student health service (clinic), located in a medium-size, urban city in Central Oklahoma; and (5) a physician's office located in a private, fee-for-service out-patient clinic, in a medium-size, urban city in Central Oklahoma. In each case, the patient (subject) was keeping an appointment to see a particular physician or came into the clinic without an appointment to see a particular physician.

Non-clinical subjects were chosen from six different sites: (1) elementary school teachers (grades 1-6) located at a small rural country school serving two small rural towns in West Texas; (2) bank employees at a medium-size bank located in a medium-size, rural city in West Texas;

(3) managerial employees at a large public utility located in a large metropolitan city in Central Oklahoma; (4) middle school and high school teachers at a small school located in a small, rural town in Central Oklahoma; (5) instructors and students at a FAA air-traffic control school located in a medium-size city in Central Oklahoma; and (6) members of a Sunday School class at a Methodist Church located in a medium-size, rural city in west Texas. All subjects were chosen primarily for their willingness to participate. Demographic information of the entire sample is located in Table 1.

Variables

This study employed three independent variables and one dependent measure. The independent variables include physician message strategy, patient receiver apprehension, and patient health beliefs. The dependent measure consists of rating and evaluation items used to determine patient preferences for physician communication message strategies.

Physician Message Strategy

Physician message strategies refer to the verbalized statements a physician will make when communicating compliance instructions to a patient. The types of strategies a physician will employ vary from physician to physician. In this study, four levels of physician compliance message strategies were used (see Appendices). The levels varied according to the amount of affectivity displayed in the strategy and the amount of information divulged in the strategy. Hence, the four levels of message strategy are: (1) high-affect/high-information, (2) high-affect/low-information, (3) low-affect/high-information, and (4) low-affect/low

Table 1

Demographics of the Sample

SEX

Males	Females
(112)	(191)

AGE

18-29 years	30-39	40-49	50-64	65 & above
(129)	(63)	(52)	(47)	(12)

LEVEL OF EDUCATION

1-4 yrs. (H.S.)	H.S. Grad.	1-2 yrs. College	3-4 yrs. College
(19)	(73)	(89)	(43)

College Graduate	M.A. or Ph.D.	Vocational Degree
(49)	(24)	(6)

LAST VISIT WITH A PHYSICIAN

Less than 6 months	½-1 year	1-1½ years	Over 2 years
(183)	(79)	(21)	(25)

information. These strategies were given to subjects in the form of written scenarios. Each message strategy contained the appropriate level of information and affectivity dependent upon it's respective level.

The message strategies involved a physician giving instructions and directions prescribing treatment for obesity. Each of the situations differed in the following manner. (1) High-affect/high-information. This message strategy portrays a physician who has a high affective communication style. Statements that convey warmth, caring, empathy, and friendliness are included. In addition, the physician divulges a high degree of medical information to the patient. Such information as the nature of the illness, incidence of the illness, and detailed instructions for optimal treatment behavior will be communicated (see Appendix B). (2) High-affect/low-information. This message strategy demonstrates a physician who conveys a high affective style (as in #1), but communicates a minimum amount of medical information regarding diagnostic and treatment concerns (see Appendix C). (3) Low-affect/high-information. The physician's message strategy in this situation portrays communication behavior which is cordial, but which is affectively neutral. A high degree of medical information is divulged (as in #1) (see Appendix D). (4) Low-affect/low-information. This message strategy involves a physician who communicates a low level of affectivity (as in #3) and minimum amount of information (as in #2) (see Appendix E).

The message strategies were constructed by a medical doctor (Director Emeritus of the Goddard Health Service at the University of Oklahoma) and this author. Obesity was chosen as the hypothetical

illness because everyone is susceptible to becoming overweight, and the treatment instructions are somewhat involved. Validation of the message strategies utilized graduate students in the school of nursing at a large southwestern university. These subjects were chosen for their experience with, and sensitivity toward, treatment compliance episodes. Thirty-seven nursing students were asked to read each message strategy and rank-order them according to: (1) the physician's level of affectivity in the strategy, and (2) the physician's level of information in the strategy. Results indicated that each scenario included the appropriate level of affectivity and information. The high-affect/high-information strategy was ranked first in level of affectivity ($\bar{X}$ = 1.84) and first in level of information ($\bar{X}$ = 1.57). The high-affect/low-information strategy was ranked second in level of affectivity ($\bar{X}$ = 1.95) and third in level of information ($\bar{X}$ = 3.05). The low-affect/high-information strategy was ranked third in level of affectivity ($\bar{X}$ = 2.83) and second in level of information ($\bar{X}$ = 2.08). The low-affect/low-information strategy was ranked last in both levels of affectivity ($\bar{X}$ = 3.38) and information ($\bar{X}$ = 3.30).

Receiver Apprehension

Receiver apprehension was utilized as a predictor variable in this study. As discussed earlier, receiver apprehension refers to the anxiety an individual experiences when receiving information from another individual. In this study, subjects' scores on the receiver apprehension test (RAT) were used to determine if a subject generally experiences anxiety while listening. A median-split was performed to divide subjects

into groups of high and low receiver apprehension. Therefore, this variable contained two levels. These two levels were used in the manipulation of the data. A copy of the receiver apprehension can be found in Appendix F.

Health Beliefs

The health belief test (model) is a measure which attempts to approximate an individual's predisposition toward health care and related phenomena. Scoring high on the health belief test indicates a patient's willingness to accept medical advice and perform prescriptive instructions in an appropriate manner. Scoring low on the health belief test would indicate the opposite. Subjects' scores on this measure were submitted to a median-split to yield two levels of health beliefs: low-compliers and high-compliers. These levels were employed in the manipulation of the data as predictor variables of patients' preferences for message strategies. The health belief test is located in Appendix G.

Subjects' Evaluation

The main dependent variable is a measure which elicits subject's preferences for physician communication message strategies. Interval-level items were used for data gathering. Preference ratings have been employed in communication research by several authors (Stull, 1975; Jablin, 1978a; Jablin, 1978b). As a side interest, items appeared on the dependent measure which asked subjects for their impressions of how natural or realistic the message strategy appeared to them. In other words, some items on the dependent measure help determine how often a patient has experienced each of the communication message strategies. The

items of the dependent measure are found below each strategy (see Appendices B-D). A rank-order task of preferred strategies was also employed. It is found in Appendix H.

Design

This experiment consisted of a 2 x 2 x 4 factoral ANOVA design. The conditions include high and low receiver apprehension, high and low health beliefs, and the four message strategies. The design is graphically illustrated in Figure 2.

Procedure

After obtaining permission from the subjects, the experimenter gave each subject a packet of material which included: (1) instructions (see Appendix A), (2) stimulus material (4 physicial message strategies), (3) dependent measures (preference ratings), (4) a receiver apprehension test (RAT), and (5) a health belief test. The order of the four physician message strategies were alternated to avoid any response bias or tendencies which could be produced by the ordering of the materials.

Subjects read each strategy and afterwards completed preference ratings about their impressions of each of the strategies. Subjects also rank-ordered the strategies and responded to the RAT and the HBT.

Upon completion of the task, subjects were thoroughly de-briefed about the purpose of the study and thanked for their participation.

DESIGN

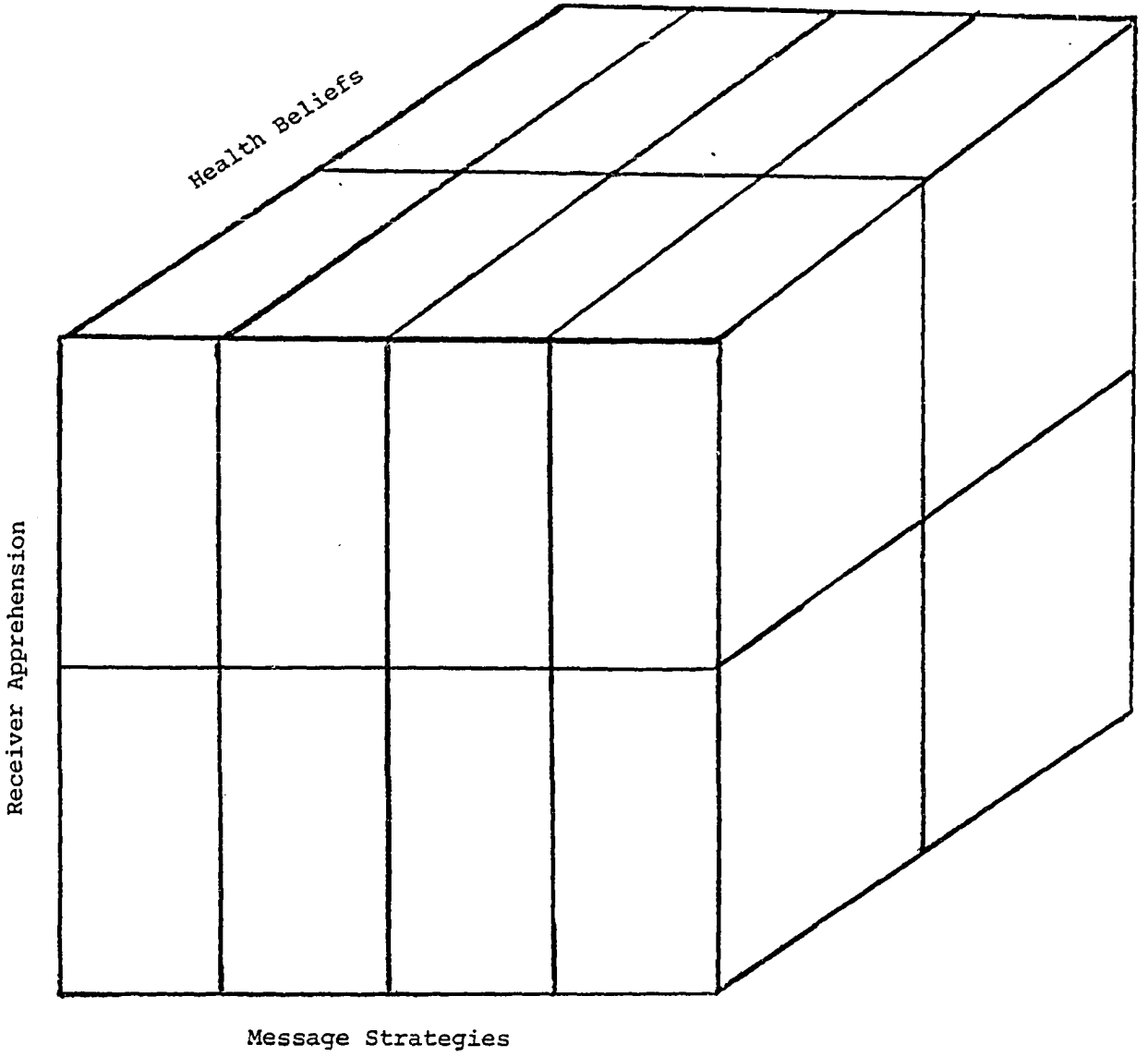

Figure 2

CHAPTER III

RESULTS

Factor Analysis of Measures

Preferences for Physician Message Strategies (PREF)

Since the dependent measures (preference scores) had not been employed previously, factor analysis was conducted on the eight items for each of the four situations. A principle components analysis with varimax rotation demonstrated that for all four message strategies, five of the eight items loaded on one factor (using .60/.40 purity criterion) while a sixth item (#1) loaded on the factor with a factor loading of .58 and a secondary loading of .09. It was decided to retain this item in the factor structure. This factor accounted for 54.7% of the total variance (λ = 4.37). This factor, termed PREF, included items 1, 2, 3, 4, 5, and 8 of the dependent measure. To the extent each of these items belong to the same factor, they can be summed for a composite preference score (PREF) for testing the hypotheses about the message strategies.

Items 6 and 7 of the dependent measure loaded on a second factor. These items, which elicited responses concerning how natural or realistic the physician in the situation appeared, were "This doctor does not sound natural" and "This doctor does not sound like most doctors I have had contact with." This factor accounted for 15.4% of the total variance (λ = 1.23), and it is termed REAL. Factor loadings for the dependent measure can be found in Table 2.

Table 2

Factor Loadings for the Dependent Measures

	ITEM	LOADING	FACTOR	COMMONALITY
1.	This situation sounds like my own doctor.	.58	(1)	.35
2.	I prefer a doctor who sounds like this one.	.90	(1)	.82
3.	I would be persuaded by this doctor.	.90	(1)	.82
4.	I would recommend this doctor to my best friend.	.91	(1)	.83
5.	This doctor sounds very competent.	.85	(1)	.74
6.	This doctor does not sound like most doctors I've had contact with.	.79	(2)	.70
7.	This doctor does not sound natural.	.77	(2)	.67
8.	I would follow this doctor's instructions without hesitation.	.83	(1)	.70

Receiver Apprehension

A principle components analysis with varimax rotation was conducted utilizing subjects' receiver apprehension scores. Five factors were extracted with eigenvalues $\geq$ 1.0: Together they accounted for 57.1% of the total variance. Factor 1 accounted for 31.2% of the variance (λ = 6.24) and contained three primary coordinate loadings $\geq$ .60 and no secondary loadings $\geq$ .40. Factor 2 accounted for 7.7% of the variance (λ = 1.53) and contained two primary loadings $\geq$ .60 and no secondary loadings $\geq$ .40. Factor 3 accounted for 7.1% of the variance (λ = 1.42) and contained two item loadings which satisfied the .60/.40 criterion. Factors 4 and 5 accounted for 6.1% (λ = 1.22) and 5.0% (λ = 1.01) of the variance, respectively. These factors had one item each loading on the .60/.40 criterion. The RAT was left intact for further analysis due to its good reliability (see next section). Table 3 presents the largest factor loadings for each item.

Health Belief Test

A principle components analysis with varimax rotation was performed on the 14-item health belief test. The analysis produced a five-factor solution with eigenvalues $\geq$ 1.0. The factors accounted for 59.8% of the variance. Each of the five factors contained two scale items which satisfied the .60/.40 purity criterion. These ten items were re-factored, and three factors emerged with eigenvalues $\geq$ 1.0. The factors accounted for 49.8% of the total variance. Each factor contained two items which met the .60/.40 criterion. The first factor also contained two additional items which met the .50/.30 criterion. It was decided to retain the

Table 3

Factor Loadings for RAT

ITEM	LOADING	FACTOR	COMMONALITY
1. I feel comfortable when listening to others on the phone.	.57	(4)	.49
2. It is often difficult for me to concentrate on what others are saying.	.49	(2)	.45
3. When listening to members of the opposite sex I find it easy to concentrate on what is being said.	.80*	(5)	.68
4. I have no fear of being a listener as a member of an audience.	.61*	(3)	.54
5. I feel relaxed when listening to new ideas.	.47	(5)	.51
6. I would rather not have to listen to other people at all.	.51	(4)	.58
7. I am generally overexcited and rattled when others are speaking to me.	.72*	(2)	.53
8. I often feel uncomfortable when listening to others.	.77*	(2)	.65
9. My thoughts become confused and jumbled when reading important information.	.54	(1)	.54
10. I often have difficulty concentrating on what others are saying.	.56	(1)	.64
11. Receiving new information makes me feel restless.	.48	(2)	.47
12. Watching television makes me nervous.	.73*	(4)	.56
13. When on a date I find myself tense and self-conscious when listening to my date.	.47	(1)	.49

Table 3 (continued)

ITEM	LOADING	FACTOR	COMMONALITY
14. I enjoy being a good listener.	.83*	(3)	.72
15. I generally find it easy to concentrate on what is being said.	.46	(3)	.70
16. I seek out the opportunity to listen to new ideas.	.51	(3)	.51
17. I have difficulty concentrating on instructions others give me.	.67*	(1)	.57
18. It is hard to listen or concentrate on what other people are saying unless I know them well.	.77*	(1)	.67
19. I feel tense when listening as a member of a social gathering.	.64*	(1)	.58
20. Television programs that attempt to change my mind about something make me nervous.	.57	(4)	.52

* Indicates satisfaction of .60/.40 purity criteria.

original 14-item structure rather than conduct analysis with the smaller re-factored structure because it did not produce a much cleaner solution and reliability was much lower for the smaller structure (see next section). Table 4 presents the largest factor loadings for each item on the 14-item health belief test.

Reliability

Reliability estimates were performed for all dependent and independent measures. Alpha coefficients served as the reliability estimates. Analysis indicated excellent reliability estimates for RAT (α = .88) and PREF (α = .94), fair reliability for the 14-item health belief test (α = .67), and poor reliability for the 10-item health belief test (α = .49).

Sample Differences

This study was interested in determining if subjects' completing the materials in a doctor's office significantly differed in their responses from subjects participating in their natural environment. ANOVA indicated that no significant differences were found between the two sample groups in their responses on PREF for any of the message strategies. Only one of the PREF measures, for the low-affect/high-information strategy, approached significance. The univariate F-ratio was 2.91 (d.f. = 1/277. $p \leq .09$). Clinical subjects rated this strategy slightly higher ($\bar{X}$ = 18.99) than non-clinical subjects ($\bar{X}$ = 17.75). Since sample groups did not differ significantly in their perceptions of the message strategies, the groups were combined and utilized in subsequent analyses.

Table 4

Factor Loadings for HBM

ITEM	LOADING	FACTOR	COMMONALITY
1. Old fashion remedies are still better than the things doctors prescribe.	.72*	(5)	.57
2. I try to do exactly what the doctor tells me to do, without hesitation.	.83*	(1)	.66
3. I worry a lot about my health.	.70*	(3)	.52
4. I always see my doctor right away after I develop symptoms, rather than waiting to see what develops.	.45	(1)	.43
5. Sometimes doctors don't tell me exactly what to do.	.78*	(4)	.63
6. I feel that I am more susceptible to illness than most people are.	.81*	(3)	.68
7. I feel that I am more concerned about health matters than most people are.	.59	(3)	.69
8. I spend more time maintaining good physical health than most people do.	.85*	(2)	.76
9. I would probably not comply with all of my doctor's recommendations.	.67*	(1)	.52
10. I have always had good rapport with doctors.	.67*	(4)	.56
11. I feel that most doctors are fully qualified to prescribe treatment for illness.	.52	(4)	.49
12. I sometimes forget to go for my doctor's appointment.	.82*	(5)	.68
13. I am a very health-conscious person.	.81*	(2)	.70
14. I recover from an illness much better and faster if I see a doctor for care.	.58	(1)	.47

* Indicates satisfaction of the .60/.40 purity criterion.

Hypothesized Findings

Message Strategy Preferences (Hypothesis 1)

Hypothesis 1 was advanced to discover if subjects, in general, differed in their overall preferences for the four various message strategies. An analysis of variance procedure indicated that subjects' preferences for strategies did differ ($F = 13.41$, d.f. = 3/283, $p \leq .001$). The grand mean of PREF and the mean ranks for each strategy are as follows: (1) the high-affect/high-information strategy was rated best on the PREF ($\bar{X} = 21.10$) and on the rank-order analysis ($\bar{X} = 2.05$); (2) the high-affect/low-information strategy was rated second-best on PREF ($\bar{X} = 20.23$) and on the rank-order analysis ($\bar{X} = 2.22$); (3) the low-affect/high-information strategy was preferred third on both the PREF ($\bar{X} = 18.29$) and the rankings ($\bar{X} = 2.61$); and (4) the low-affect/low-information strategy was preferred last on the PREF ($\bar{X} = 15.32$) and the rank-order data ($\bar{X} = 3.10$). The most striking finding from this analysis was the uniformly low preference for the low-affect/low-information strategy.

Receiver Apprehension (Hypothesis 2)

The second hypothesis concerned patients' level of receiver apprehension as a predictor of preference for physician message strategy, that is, differences will be found between high receiver apprehensives and low receiver apprehensives in their preferences for the message strategies. A patient's level of receiver apprehension was arrived at through summing the scores on the RAT. A frequency distribution revealed that a median-split (i.e., the mid-point of a frequency distribution of RAT scores) was located at 41. Therefore those subjects scoring 41 and below were designated as low receiver apprehensives and those subjects scoring

42 and above were designated as high receiver apprehensives. Analysis of variance indicated that high and low receiver apprehensive individuals did not differ in their preference for the physician message strategies. It was decided to accentuate the differences in receiver apprehension; consequently the RAT frequency distribution was separated into quartiles. The top and bottom quartiles were selected as high and low receiver apprehension groups, respectively. An analysis of variance technique indicated no significant differences between groups except for the low-affect/low-information strategy ($F = 6.21$, d.f. = 1/121, $p \leq .01$). High receiver apprehensives ($\bar{X} = 16.62$) preferred this physician strategy more than low receiver apprehensive subjects ($\bar{X} = 13.82$). Hypothesis 2 was partially supported.

Health Beliefs (Hypothesis 3)

Health beliefs is a construct which represents a patient's willingness or predisposition toward compliance with a physician's recommendations. Hypothesis three sought to determine if individuals with a high level of health beliefs (high-compliers) would differ from individuals with a low level of health beliefs (low-compliers) in their preference for physician message strategies. A median-split was conducted on subjects' responses to the HBT to yield two testable groups (median = 42). Analysis of variance revealed that high and low compliers differed in preferences for the high-affect/high-information strategy ($F = 3.77$, d.f. = 1/263, $p \leq .05$). High-compliers ($\bar{X} = 21.67$) preferred this strategy more than low-compliers ($\bar{X} = 20.33$). No other message strategies were differentially preferred by health belief groups. A difference in preferences for the high-affect/low-information strategy approached significance

($F = 2.74$, d.f. = 1/263, $p \leq .09$). Again, high-compliers ($\bar{X} = 20.66$) preferred this strategy over low-compliers ($\bar{X} = 19.46$). A quartile-split produced no differences in preference for any of the four strategies. Hypotheses 3 was partially supported.

Interaction Effects--RAT & HBT (Hypothesis 4)

The fourth hypothesis was interested in the possible interaction between levels of receiver apprehension and health beliefs regarding preferences for message strategies; or more specifically, the interaction between patients' level of receiver apprehension and their level of health beliefs will produce differences among groups in preferences for physician message strategies. Using a median-split for division of groups for RAT and HBT, analysis of variance found that subjects with a high level of receiver apprehension and health beliefs ($\bar{X} = 16.33$) preferred the low-affect/low-information strategy over subjects with a low level of receiver apprehension and a high level of health beliefs ($\bar{X} = 13.74$). The F-ratio was 4.05 (d.f. = 1/248, $p \leq .05$). Except for the main-effect of HBT approaching significance ($F - 3.54$, d.f. = 1/248, $p \leq .06$) no other differences were found. In this case, as before, high-compliers ($\bar{X} = 21.64$) preferred this strategy over low-compliers ($\bar{X} = 20.40$).

A quartile-split of the independent measures was conducted to accentuate the level of receiver apprehension and health beliefs. It was of interest to determine if larger differences in receiver apprehension and health beliefs would produce more dramatic or even different results. By conducting ANOVA, it was determined that low-receiver apprehensive/low-compliers ($\bar{X} = 24.58$) preferred the high-affect/high-information

strategy over either low-receiver apprehensive/high-compliers ($\bar{X}$ = 21.32) or high-receiver apprehensive/low-compliers ($\bar{X}$ = 21.61). The F-ratio was 5.03 (d.f. = 1.76, $p \leq .04$). In addition, individuals with a high level of both receiver apprehension and health beliefs ($\bar{X}$ = 17.17) preferred the low-affect/low-information strategy over low-apprehensive/high-health belief subjects ($\bar{X}$ = 12.80). The F-ratio was 4.14 (d.f. = 1/76, $p \leq .05$). Hypothesis 4 was generally supported.

REAL (Residual Analysis)

This peripheral research interest, sought to ascertain subjects' perceptions of the naturalness or realism imbued by the physician message strategies. The results indicated that the high-affect/high-information strategy ($\bar{X}$ = 6.18) was considered most representative of physician behavior and the high-affect/low-information strategy was rated second-most realistic ($\bar{X}$ = 6.15); while the low-affect/high-information strategy ($\bar{X}$ = 5.98) and the low-affect/low-information strategy ($\bar{X}$ = 5.71) were perceived as lower in realism or naturalness.

Further, it was found that non-clinical subjects ($\bar{X}$ = 6.45) perceived the high-affect/high-information strategy more realistic than clinical subjects ($\bar{X}$ = 5.89). The univariate F-ratio was 8.52 (d.f. = 1/263 $p \leq .04$). Likewise, non-clinical subjects ($\bar{X}$ = 6.46) considered the high-affect/low-information strategy more realistic than clinical subjects ($\bar{X}$ = 5.83). The F-ratio was 10.04 (d.f. = 1.263, $p \leq .002$). No differences were found for the remaining message strategies.

CHAPTER IV

DISCUSSION

The purpose of this chapter is to further develop and interpret the results of this study. The study involved several dimensions, and as such, this discussion will treat each one separately with a final section drawing the study together. The first section will involve a discussion of the instrument, PREF. The subsequent sections include treatment of: (1) hypotheses one, two, three, and four; (2) the limitations of the study; (3) the implications of the study for future research; (4) a summary of the study; and (5) a discussion of the relevance of these results for the compliance model presented in Chapter I.

PREF

One of the encouraging results of this study involves the emergence of a unidimensional and reliable instrument which determines patient preferences for physician communication behavior, PREF. It was one of the contentions of this study that preferences are necessary, but not sufficient conditions for patient compliance. This was empirically borne out by the intercorrelation coefficients of items on PREF which tap both preference for physician communication strategy (items 2, 4, & 5) and willingness to comply with prescribed regimen (items 3 & 8). This instrument, therefore, involves a patient perception of physician communication which would predict a patient's compliance tendency based on

the preference of the physician's communication strategy; a supposition heretofore unsubstantiated.

This study provides a strong rationale for behavioral intervention by the physician in an effort to enhance complaint behavior from patients. Patients are more likely to comply if they prefer the message strategy communicated by the physician. The implications of this notion are quite involved and will be discussed in a subsequent section.

Sample Differences

It should be encouraging to researchers of the doctor-patient relationship that no differences in responses were found between clinical and non-clinical subjects. Given that subjects respond to stimulus material consistently, without experiencing "setting" effects, provides health communication researchers with a wider, richer, and more available sample pool. As this researcher can testify, actual "patients" (subjects involved in the actual delivery of health care) are difficult to survey. Understandably, patients' primary concern is their health, and many times patients are too preoccupied with personal exigencies to participate in an experiment. This study provides the justification for non-clinic patient utilization, especially when employing PREF.

Differences in responses did occur on REAL; non-clinical subjects perceived the high-affect/high-information and high-affect/low-information strategies as more realistic than clinical subjects. It is suspected that since these strategies were most preferred by subjects, a "halo" effect occurred for non-clinical subjects, that is preference for these scenarios caused non-clinical subjects to perceive them as natural and realistic.

Clinical subjects experienced no similar "halo" effect, perhaps due to the immediacy of the situation in which they were situated. Clinical subjects, waiting to visit a physician, were better able to separate preference for a strategy from perceptions of the realism of the strategy. Further research should address this concern.

Differences in Preferences

The first hypothesis was interested in whether subjects differ in their preferences for various physician communication strategies. In essence, subjects significantly differed in their preferences for the strategies employed in this study. Subjects preferred most the high-affect/high-information message ($\bar{X}$ = 21.10) and preferred least the low-affect/low-information message ($\bar{X}$ = 15.32). The reader should note the large mean difference especially when examining scale-unit differences (i.e., a mean difference of 5.78 on a six-item scale producing almost one scale-unit difference between these groups). The analysis found that the strategies high in affectivity were preferred the most. Thus, affectivity is a crucial element in effective physician strategies. This result is consistent with previous research (Eisenberg, 1977).

These results would indicate that the inclusion of more affective utterances would induce a higher level of patient preference for the message strategy and would consequently lead to better compliance. It is important to note that while patients may desire larger quantities of information from their physicians (Westcott, 1980; Almy, 1980), they do not want the information at the expense of affectivity. Preference for the high-affect/low-information over the low-affect/high-information strategy indicates this.

RAT

The second hypothesis was concerned with effects of receiver apprehension on subjects' preferences for physician message strategies. High receiver apprehension is characterized by an individual's perceived inability to receive large amounts of information in a short period of time. As predicted, receiver apprehension demonstrated itself as a reliable predictor of preference for message strategy. High apprehensive subjects significantly preferred the strategy containing the lowest of information, low-affect/low-information. It should be noted that the PREF mean for high apprehensive subjects was 16.63 while the mean for low apprehensive subjects was 13.82. Given that PREF contains six items, the mean score for each item per subject is 2.77 for high apprehensives and 2.30 for low apprehensives, nearly a half of a scale-unit difference.

Since high receiver apprehensives prefer a low-information strategy (even at the expense of affectivity), physicians should adjust their behavior to be sensitive to this issue. Even more importantly, the medical problem employed in this study was hypothetical and not necessarily life-threatening--obesity. In an actual physician-patient encounter involving real illness with severe consequences, receiver apprehension may be felt more acutely. Physicians, therefore, should become more sensitive to the issue of impaired or restricted information receiving capabilities by some individuals.

Health Beliefs

Hypothesis 3 predicted that an individual's health beliefs would influence their preference for compliance strategies. The hypothesis was partially confirmed: individuals scoring high on the health belief test

(high-compliers) significantly preferred a physician communication strategy high in affectivity and high in information ($\bar{X}$ = 21.67) more than low-compliers ($\bar{X}$ = 20.33), and high-compliers also slightly preferred the high-affect/low-information strategy ($\bar{X}$ = 20.66) more than low-compliers ($\bar{X}$ = 19.46). The meaningful differences (scale-unit differences) are not very large in the case of health beliefs. It would appear, however, that the important dimension involved in high-compliers' preference for compliance strategies is affectivity. Although no significant difference was demonstrated, low-compliers slightly preferred the low affective strategies more than high-compliers.

These results indicate that individuals who have predisposition. or willingness to comply trait identify more with a physician who demonstrates warmth, caring, understanding, empathy, and encourages feedback, and do not always prefer one type of information strategy over another. It may be that high-compliers--those with high regard for personal health, favorable opinions of physicians in general, and good perceived rapport with physicians--may have as their primary concern supportive affective messages from their physician. Health beliefs, in general, may be tapping a more specific dimension than originally thought, that is, preference for a supportive socio-emotional climate with their physician. Further research should examine this possibility.

Interaction Effects

The fourth hypothesis addressed the assumption that an individual's level of receiver apprehension and health beliefs may interact to influence preferences for physician message strategies. This hypothesis was

confirmed in two ways. First, subjects scoring high on both RAT and HBT significantly preferred the low-affect/low-information strategy ($\bar{X}$ = 17.71) compared to those scoring low on these measures ($\bar{X}$ = 12.80). This mean difference of 4.91 is meaningful as well as significant, since it indicates that the groups differ by nearly a full scale-unit.

Obviously, receiver apprehension is such a dominant factor that it overwhelmed the health belief qualities of an individual, such that the lowest information strategy was preferred. It would seem reasonable that subjects in this condition (high-RAT/high-HBT) prefer a low information strategy due to the nature of receiver apprehension (desire for low information) and because high-compliers have no overt preference for one information strategy over another. In fact, it was originally expected that high-compliers might have less of a need for high-levels of information since they are predisposed toward compliance and would not have to be convinced by a physician to comply. It is interesting, however, that high-compliers in general, preferred the high-affect/high-information strategy, but high-compliers with high receiver apprehension qualities would have a preference for a strategy low in affect and information.

The second interaction effect (between RAT and HBT) affecting preferences for messages strategies concerned subjects low in receiver apprehension and health beliefs. These subjects preferred the high-affect/high-information strategy ($\bar{X}$ = 24.58) over either low-apprehensive/high-compliers ($\bar{X}$ = 21.32) or high-apprehensive/low-compliers ($\bar{X}$ = 21.61). Again a half scale-unit difference existed for these groups suggesting a meaningful difference. This result is not surprising, in that low receiver apprehension subjects should have a low anxiety level toward

receiving large amounts of information in a short period of time, and low-compliers may feel they need a high level of information to become convinced that compliance is necessary. To the extent this preferred strategy was rated highest in information level, the result is consistent with previous expectations. However, it again appears that receiver apprehension is a very dominant factor which can influence compliance tendencies with respect to preferences for message strategy, especially since low-compliers had no preference for high levels of information when examining the main effects for health beliefs.

These results are encouraging in that physician's message strategies could be adapted in a consistent manner to accommodate patient variables affecting preferences for certain types of strategies. For instance, if after testing subjects for receiver apprehension and health beliefs, a physician determines a patient is high in receiver apprehension and high in health beliefs, the physician would know to communicate a compliance strategy low in affect, but also low in information. Likewise, a patient determined to be low in receiver apprehension and low in health beliefs should receive a physician strategy high in affect and information.

Limitations of the Study

There were some limitations to this study which should be pointed out. First, the health belief test was not as reliable as hoped (α = .67). The instrument previously employed an interview format (Becker, 1980) for responses, and this study was an initial attempt to convert this measure into a self-report, interval-level instrument. Further utilization of

this instrument, as it was structured in this study, should include the addition of other items. By employing a larger number of items factor analysis could reveal additional items consistent with the HBM and would improve the reliability of the HBT.

The issue of power was the second limitation of this study. In some cases (global differences in preferences for strategies, main-effects for RAT and HBT), the power of the test may have been high enough to create the possibility of Type I error. It was felt, however, that this was probably not the case. For instance, in each case where a significant difference between groups was reported meaningful differences exist.

When the means for these groups were divided by the number of items on the dependent measure (PREF), notable scale-unit differences were found. If the power for these tests was too large, meaningful differences would not have been found. In addition, if unusual findings had emerged the analysis might have been suspect, but those differences found were ones which had been hypothesized. In addition, when the power of a test was large as in the overall preferences for strategies utilizing 284 subjects the scale-unit differences was quite large, while the analysis of differences in preference for strategies involving the interaction between receiver apprehension and health beliefs utilizing only 77 subjects demonstrated that the scale-unit differences were almost as large. Therefore, while the power issue is a recognized concern, it is doubtful that Type I error exists for these results.

Implications

A study such as this produces many implications and ramifications. First, the results indicating no difference in preferences between in-clinic and out-of-clinic subjects is encouraging. Researchers should feel less hesitation in surveying subjects outside of the "clinic" setting, especially when eliciting self-report and evaluation data. The difficulty of surveying in-clinic subjects was discussed earlier. These results should, therefore, provide more confidence for researchers wishing to utilize non-patient subjects. Further research along these lines should be pursued.

Second, the PREF proved to be an extremely useful and reliable instrument for eliciting patients preferences for physician communication behavior. The implications of this measure are far-reaching. Specifically, researchers should be able to employ PREF in a multiplicity of situations by varying the manner and type of physician communication behavior. For example, variables which have been associated with the communication process could be studied. Such variables as dogmatism, message complexity, vagueness, power imagery, and others would be ripe for study. These variables would provide further insight into physician communication most and least preferred by patients. For instance, PREF could be used to determine preferences for physician message strategies which varied in the level of vagueness. Subjects who are self-confident with high health beliefs may not object to a vague message as much as those patients who are less confident and possessing lower health beliefs. Research of this nature would be valuable to ascertain which patients need special strategies with a high degree of clarity. Additionally, message strategies

which are low (versus high) in dogmatism may be preferred by patients who hold adverse opinions of authority and power. A physician with a dogmatic style may increase the chance of patient non-compliance in this case.

The PREF measure should be employed in a demographic analysis of preferences for physician communication behavior. Age, gender, and level of education could be examined as predictors of patient preferences for physician message strategy. It would also be valuable to employ PREF in the examination of potential differences between acute and chronic illness groups in their preferences for message strategies. Patients who are chronically ill may prefer a more affective physician with good interpersonal skills than a patient who is experiencing acute illness.

In addition to physician or interaction variables, employment of the PREF for patient preferences of other health professionals should be attempted. In this way, research would demonstrate whether PREF is a global measure of preference for health professionals in general, or whether the instrument is indicative of preferences for physician communication only.

Third, this experiment should be replicated and the study of additional patient variables should be examined. Cognitive complexity, dogmatism, machiavellianism, and perceived intimacy of the doctor-patient relationship could act as excellent patient variables for a study of this nature. For example, patients who perceive a high degree of intimacy with their doctor may prefer a highly affective style of communication, while those patients with a low perceived level of intimacy with their physician may have no such preference. Further, the issue (or variable) of

information level contained in a message strategy could be further explored by involving subjects who vary in their level of cognitive complexity. Cognitively complex individuals may have greater preferences for those strategies high in information.

Further examination of the patient and associated variables would enlarge the information we have regarding patient preferences for message strategies and consequently, patient compliance.

Fourth, the study reported here answers, to some extent, the question, "Is preference for a communication strategy positively associated with compliance?" This study demonstrated that the relationship between preference and compliance is positive. Subjects consistently reported compliance tendencies toward the communication strategies which they most preferred and reported low-likelihood of compliance for those strategies least preferred. The implications of these findings could be applicable to non-medical settings. Compliance-gaining attempts in situations such as political advertisements, fund-raising activities, instructional settings, and informal interpersonal relationships could be studied for replication and cross-situational consistency effects.

Fifth, this study implies that physicians should systematically query patients about those personality variables that may affect compliance. It is important (as this study found) to ascertain a patient's level of receiver apprehension so that the optimal amount of information can be disseminated to patients. The health beliefs of a patient could provide further information to the physician regarding the appropriate selection of message strategies. Compliance with recommendations would increase with the utilization of the appropriate strategy.

Finally, it would be valuable to replicate this study employing various other stimulus media other than the written strategies employed. Video-tape segments of a "doctor" communicating these strategies could be played to subjects to determine if a stimulus effect occurs. An even more ecologically valid procedure would involve the utilization of real actor-doctors. These methods would provide more generalizability toward the results of a study such as this one.

Summary

This study investigated the preferences of patients toward various types of physician-communicated message strategies involving treatment recommendation for obesity. Subjects included 303 in-clinic and non-clinic volunteers in a wide range of settings. Subjects were asked to respond to preference items concerning message strategies they read. The message strategies emulated a physician giving information and instructions for the treatment of obesity and each strategy varied in the level of affectivity and information present. Subjects also responded to the receiver apprehension test and the health belief test. The design of the experiment involved a 2 x 2 x 4 design. Several significant results emerged from the study: (1) an instrument was developed which reliably determines preferences for physician communication behavior (PREF). (2) This study found preference for a communication strategy to be positively related to likelihood of compliance with that strategy. (3) It was discovered that individuals differ in their preferences for various physician message strategies. (4) Differences in preferences for strategies can be predicted on the basis of receiver apprehension--high receiver

apprehensives prefer low-affective/low-information strategies. (5) A patient's level of health beliefs also can determine preference for a strategy--subjects with high health beliefs (high-compliers) significantly preferred a strategy which included high affect and high information. (6) Receiver apprehension and health beliefs interacted to produce differences in a subject's preference for strategies--subjects high in receiver apprehension and health beliefs preferred a strategy low in affect and information, while low receiver apprehensive, low health belief subjects preferred the high-affect/high-information strategy.

The Compliance Model Revisited

The medical compliance model initially advanced (Chapter I) was explained as encompassing many of the variables associated with the issue of patient compliance. This study gives support to several of the variables contained in the model: receiver apprehension and health beliefs (patient variables) and, the level of affectivity and the level of information communicated by a physician (interaction variables). For these variables, the model appears to be a valid representation of compliance. As mentioned earlier, the model is patterned after the Yale studies approach to learning theory. While this approach is limited, it does provide a basis for examining the many compliance variables. It was not meant to totally explain patient compliance, as much as it describes the various variables and relationships which may exist in the process. This study, therefore, provides more information for a description of compliance.

Further research should examine other variables which might relate to the model so that a thorough description of the patient compliance phenomenon may occur.

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APPENDIX A

INSTRUCTIONS

You are being asked to participate in an experiment concerning different styles of communication behavior utilized by physicians. Each of the following situations are hypothetical. We are asking people to read each of the 4 situations and then, answer some questions about their attitude or perceptions about the different situations. Specifically, we want you to: (1) read the situation as if the doctor were actually talking to you; as if you were actually in a doctor's office and he were saying these things to you, and (2) after reading the situation, please fill out the questionnaire listed below each of the situations. Please be honest. No one will ever know what you put on the questionnaire. Each of the situations involve the same basic material: a doctor explaining and describing treatment for obesity. Each of the situations will be a little different according to the communication style of the doctor.

Read each situation carefully and act as if the doctor were actually talking to you.

THANK YOU

(Please circle)

SEX: Female Male

AGE: 18 - 29 30 - 39 40 - 49 50 - 64 65 & above

EDUCATION LEVEL: 1 - 4 years of high school high school graduate

1 - 2 years of college 3 - 4 years of college

College graduate Masters of Ph.D. degree Vocational degree

THE LAST TIME I SAW A DOCTOR WAS: Less than 6 months ago

½ - 1 year ago 1¼ - 2 years ago Over 2 years ago

APPENDIX B.

THE DOCTOR SAYS TO YOU:

"I feel that you weigh more than a person of your frame and height should. Obesity is a problem for many people. Our intake of food or calories is greater than the energy expended to live. Probably the best way to tell if you're over-weight is by skin folds rather than actual weight. If you can pinch more than a half-inch under your arm or more than one inch at the waist, you are probably overweight. If you do weigh yourself, remember to weigh at the same time each day. We weigh different amounts during different parts of the day. Obesity can become a problem for many people. For instance, obesity is directly related to hypertension, heart disease, diabetes, and osteoarthritis. I'd like to make my prescriptions for a weight reduction plan as painless as possible for you. Here is what I'd like for you to do. First, eat more slowly, OK? Second, be sure to eat three meals a day. You don't want to skip meals because it causes over-eating. All right? Next, always include sufficient amounts of water in your diet--at least 6 glasses between meals. Fourth, I would like to see you follow a moderate, but regular exercise plan. It is important to exercise regularly. Finally, I want you to reduce your dietary intake to 2000 calories per day until we begin to make noticable gains in your weight reduction. By the way, what is your current caloric intake? Le me say that going off your diet for one meal is not going to make much difference. So, if you want to eat beyond what your diet recommends once in a while, it's all right. Do you have any questions? OK, we'll see you in one month to determine your excellent progress."

Below are several questions concerning the situation you just read. Please indicate your impression of the situation by circling the appropriate number for each of the questions. For each question circle: a (5) if you strongly agree, a (4) if you agree, a (3) if you are undecided or neutral, a (2) if you disagree, or a (1) if you strongly disagree.

	SA	A	N	D	SD
1. This situation sounds like my own doctor.	5	4	3	2	1
2. I prefer a doctor who sounds like this one.	5	4	3	2	1
3. I would be persuaded by this doctor.	5	4	3	2	1
4. I would recommend this doctor to my best friend.	5	4	3	2	1
5. This doctor sounds very competent.	5	4	3	2	1
6. This doctor does not sound like most doctors I've had contact with.	5	4	3	2	1
7. This doctor does not sound natural.	5	4	3	2	1
8. I would follow this doctor's instructions without hesitation.	5	4	3	2	1

APPENDIX C

THE DOCTOR SAYS TO YOU:

"I'm afraid that you wiegh more than you really should. Obesity is a problem for a lot of people. Many of my relatives are constantly fighting a weight problem--I have to keep a close watch on myself. I'll bet you can think of your own relatives and find some who are overweight. Being over-weight can cause other health problems such as high-blood pressure, heart trouble, and other illnesses. People are in better health when they weigh the right amount. It's easier to climb stairs; it's easier to get in and out of automobiles; and it's easier to get out of your favorite chair when you weigh less. I think the best thing for you would be to follow my suggestions and your weight should decline. First of all, when eating meals, eat more slowly, all right? Another important item is to drink a lot of water each day. Any problems with that? I would also like to see you exercise more on a regular basis. Did you ever think of taking up jogging as exercise? My wife just started jogging and she really loves it. That would help take off some pounds, as you probably know. Finally, I'd like for you to reduce your calorie level to 2000 per day. That level may be considerably less than usual, but I know that you can handle it. OK? Are there any questions on your mind? OK. Well, I would like to see you again in one month to see how well you've done."

Below are several questions concerning the situation you just read. Please indicate your impression of the situation by circling the appropriate number for each of the questions. For each question circle: a (5) if you strongly agree, a (4) if you agree, a (3) if you are undecided or neutral, a (2) if you disagree, and a (1) if you strongly disagree.

		SA	A	N	D	SD
1.	This doctor sounds like my own doctor.	5	4	3	2	1
2.	I prefer a doctor who sounds like this one.	5	4	3	2	1
3.	I would be persuaded by this doctor.	5	4	3	2	1
4.	I would recommend this doctor to my best friend.	5	4	3	2	1
5.	This doctor sounds very competent.	5	4	3	2	1
6.	This doctor does not sound like most doctors I've had contact with.	5	4	3	2	1
7.	This doctor does not sound natural.	5	4	3	2	1
8.	I would follow this doctor's instructions without hesitation.	5	4	3	2	1

APPENDIX D

THE DOCTOR SAYS TO YOU:

"You have developed a weight problem which should be corrected. You have not allowed your exercise level to keep pace with your calorie intake. Obesity is a problem which can have deleterious effects upon the body. Hypertension, heart disease, diabetes, and osteoarthritis are all directly related to obesity. It also affects the physical appearance of an individual. You don't want to look overweight all your life, do you? One of the best methods to tell if you are overweight is by the folds in your skin. If you can pinch more than a half-inch under your arm or more than one inch at the waist, you are probably over-weight. If you insist on using scales to test your weight, always weigh at the same time of the day. A person's body weight will vary throughout the day. I am going to prescribe a weight reduction plan which you should strictly follow. First, eat more slowly. Second, always eat three meals a day. Do not skip meals; it causes over-eating. Third, drink a substantial amount of water every day. Fourth, find a moderate exercise plan and stick to it, regularly. Regular exercise is much better than sporadic exercise. Finally, restrict your dietary intake to 2000 calories per day until further notice. I am sure your current intake exceeds that now. You will just have to stop eating as much. I want to see you again when you have lost 10 pounds. Make an appointment with the receptionist when you have accomplished that."

Below are several questions concerning the situation you just read. Please indicate your impression of the situation by circling the appropriate number for each of the questions. For each question circle a: (5) if you strongly agree, a (4) if you agree, a (3) if you are undecided or neutral, a (2) if you disagree, or a (1) if you strongly disagree.

		SA	A	N	D	SD
1.	This situation sounds like my own doctor.	5	4	3	2	1
2.	I prefer a doctor who sounds like this one.	5	4	3	2	1
3.	I would be persuaded by this doctor.	5	4	3	2	1
4.	I would recommend this doctor to my best friend.	5	4	3	2	1
5.	This doctor sounds very competent.	5	4	3	2	1
6.	This doctor does not sound like most doctors I've had contact with.	5	4	3	2	1
7.	This doctor does not sound natural.	5	4	3	2	1
8.	I would follow this doctor's instructions without hesitation.	5	4	3	2	1

APPENDIX E

THE DOCTOR SAYS TO YOU:

"As you have probably observed, you have become overweight. Obesity can can have a negative effect upon the body. High-blood pressure can develop as a result of obesity as well as heart trouble and other illnesses. You have to lose weight if you are going to avoid health problems. Not only do you weigh more than a person of your height and frame should, but the extra weight is rounding your figure out. You don't want to look like that all your life, do you? If you want to lose weight, you should follow a diet plan I will give you. This plan may not be easy, but it's the only way you'll be able to take off some of that excess bulk. First, eat more slowly than you have been eating. Don't gulp your food down. Second, be sure that you drink a lot of water each day. There is nothing wrong with water, and don't avoid it. Third, you should find an exercise plan and stick to it regularly. Exercising is a big fad now; I'm surprised that you haven't taken it up yet. You will have to go on a diet, also. Do not get above the 2000 calorie level each day. A diet such as this will probably seem like quite a reduction for you. Weight reduction is basically a personal problem; it's up to you to make it work. So, I don't want to see you again until you have lost 10 pounds. When you've done that, call my receptionist and make an appointment."

Below are several questions concerning the situation you just read. Please indicate your impression of the situation by circling the appropriate number for each of the questions. For each question circle: a (5) if you strongly agree, a (4) if you agree, a (3) if you are undecided or neutral, a (2) if you disagree, or a (1) if you strongly disagree.

		SA	A	N	D	SD
1.	This situation sounds like my own doctor.	5	4	3	2	1
2.	I prefer a doctor who sounds like this one.	5	4	3	2	1
3.	I would be persuaded by this doctor.	5	4	3	2	1
4.	I would recommend this doctor to my best friend.	5	4	3	2	1
5.	This doctor sounds very competent.	5	4	3	2	1
6.	This doctor does not sound like most doctors I've had contact with.	5	4	3	2	1
7.	This doctor does not sound natural.	5	4	3	2	1
8.	I would follow this doctor's instructions without hesitation.	5	4	3	2	1

APPENDIX F

The following statements apply to how various people feel about receiving communication. Please indicate if these statements apply to how you feel by noting whether you (5) strongly agree, (4) agree, (3) are undecided or are neutral, (2) disagree, or (1) strongly disagree.

		SA	A	N	D	SD
1.	I feel comfortable when listening to others on the phone.	5	4	3	2	1
2.	It is often difficult for me to concentrate on what others are saying.	5	4	3	2	1
3.	When listening to members of the opposite sex I find it easy to concentrate on what is being said.	5	4	3	2	1
4.	I have no fear of being a listener as a member of an audience.	5	4	3	2	1
5.	I feel relaxed when listening to new ideas.	5	4	3	2	1
6.	I would rather not have to listen to other people at all.	5	4	3	2	1
7.	I am generally overexcited and rattled when others are speaking to me.	5	4	3	2	1
8.	I often feel uncomfortable when listening to others.	5	4	3	2	1
9.	My thoughts become confused and jumbled when reading important information.	5	4	3	2	1
10.	I often have difficulty concentrating on what others are saying.	5	4	3	2	1
11.	Receiving new information makes me feel restless.	5	4	3	2	1
12.	Watching television makes me nervous.	5	4	3	2	1
13.	When on a date I find myself tense and self-conscious when listening to my date.	5	4	3	2	1
14.	I enjoy being a good listener.	5	4	3	2	1
15.	I generally find it easy to concentrate on what is being said.	5	4	3	2	1
16.	I seek out the opportunity to listen to new ideas.	5	4	3	2	1
17.	I have difficulty concentrating on instructions others give me.	5	4	3	2	1
18.	It is hard to listen or concentrate on what other people are saying unless I know them all.	5	4	3	2	1
19.	I feel tense when listening as a member of a social gathering.	5	4	3	2	1
20.	Television programs that attempt to change my mind about something make me nervous.	5	4	3	2	1

APPENDIX G

The following statements apply to how people feel about various health matters. Indicate if these statements apply to how you feel by noting whether you: (5) strongly agree, (4) agree, (3) are undecided or neutral, (2) disagree, or (1) strongly disagree.

		SA	A	N	D	SD
1.	Old fashion remedies are still better than the things doctors prescribe.	5	4	3	2	1
2.	I try to do exactly what the doctor tells me to do, without hesitation.	5	4	3	2	1
3.	I worry a lot about my health.	5	4	3	2	1
4.	I always see my doctor right away after I develop symptoms, rather than waiting to see what developes.	5	4	3	2	1
5.	Sometimes doctors don't tell me exactly what to do.	5	4	3	2	1
6.	I feel that I am more susceptible to illness than most people are.	5	4	3	2	1
7.	I feel that I am more concerned about health matters than most people are.	5	4	3	2	1
8.	I spend more time maintaining good physical health than most people do.	5	4	3	2	1
9.	I would probably not comply with all of my doctor's recommendations.	5	4	3	2	1
10.	I have always had good rapport with doctors.	5	4	3	2	1
11.	I feel that most doctors are fully qualified to prescribe treatment for illness.	5	4	3	2	1
12.	I sometimes forget to go for my doctor's appointment.	5	4	3	2	1
13.	I am a very health-conscious person.	5	4	3	2	1
14.	I recover from an illness much better and faster if I see a doctor for care.	5	4	3	2	1

APPENDIX H

Please rank-order the previous 4 situations according to which ones you thought were best. Place (1) for the best situation, a (2) for the second-best situation, a (3) for the third-best situation, and a (4) for the worse situation.

Situation #1 _____

Sutiation #2 _____

Situation #3 _____

Situation #4 _____