

ADHERENCE TO A WORK-SITE
RELAXATION PROGRAM

by

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LITERATURE REVIEW

Introduction

The present study is an investigation of the effects of perceived control on adherence to a therapeutic regimen. Adherence or compliance may be defined as the extent to which a person's behavior (taking medication, following a diet, or maintaining positive lifestyle habits) coincides with medical advice (Haynes, 1979). Practitioners' concern with patient adherence seems to parallel the development of effective medical interventions. In 1959 Shapiro maintained that "The history of medical treatment until relatively recently was the history of the placebo effect." Since the time of his observation, adherence research has burgeoned. Investigators have attempted, with little success, to determine the causes of non-adherence and, to a lesser extent, the optimal ways of increasing adherence. The recent development of preventive Behavioral Medicine has focused attention more specifically on effective clinician strategies for improving the consistency of clients' self care behaviors, both health maintenance as well as restorative behaviors. Providing clients with a sense of enhanced responsibility for their treatment has been proposed as one possibly effective strategy (Eisenthal, Emery, Lazare & Udin, 1979; Francis, Korsch & Morris, 1969). This is an attractive approach because it is consistent with the self-care model of health which has recently been recognized as integral to the improvement of the general health of the society (Barofsky, 1979; Healthy People, 1979).

Defining Adherence

The recognition now accorded the client's pivotal role in health care is obvious in the stance taken by Dunbar and Stunkard (1979) regarding terminology. They maintain that there should be a redefinition so that rather than speaking of compliance to medical regimens we speak of adherence to them. There are two negative connotations they hope to avoid in this way. The first is that of the "compliant" patient as a passive, obedient recipient of treatment. The second is the implication that a non-compliant patient is the person at fault. The use of the less value-laden term, adherence, is an attempt to refocus on the self-care aspects of health maintenance activities. While recognizing the significance of this relabeling and the implication of utilizing the term compliance, it is nonetheless the most readily understood term and one that will be used interchangeably with the term adherence in the presentation of this study.

Adherence or compliance refers to the extent that a patient or client engages in a prescribed activity. A variety of definitions have been employed to distinguish the adherer from the non-adherer. In some instances adherence is obtained when the prescribed activity is achieved to criterion. While this is a rational definition it assumes knowledge of a valid dose-response relationship, information rarely available to the practitioner. When the minimum amount of compliance necessary for effective treatment is known, this is a useful strategy for defining the role of adherence in treatment outcome. A second approach has been to separate individuals into categories ranging from adherent to

non-adherent on the basis of some objective or subjective criterion. The criteria for classification have ranged from such objective standards as metabolic evidence of a drug in blood or urine samples to subjective measures such as clinician rating of adherence. A final, and perhaps most heuristically useful strategy is the percent or proportion of adherence achieved. This focuses on the number of times a behavior was prescribed relative to the number of times it was accomplished.

Theoretical and programmatic considerations determine the choice of method used to define adherence. A continuous measurement such as percentage of adherence is preferred to categorical measurements which often simply dichotomize individuals into adherent and drop-out categories. The complexity of health behavior mandates the necessity of measures that completely reflect the effect of situation, clinician and client variables and the interaction of these.

Assessment of Adherence

Just as defining adherence is conceptually and methodologically complex, there is no one completely satisfying method of assessing compliance. A fundamental reason for this dilemma is that adherence is a reactive phenomena, attention to the behavior may, in itself, increase or decrease it in response to the demand characteristics of the situation. Additionally, adherence is frequently maintained outside the direct observation of the clinician with the result that the majority of available assessment strategies are essentially variations on the self-report measure. While some reviews have determined that

self-report correlates very highly with therapist and assessor ratings (Agras and Jacob, 1980), the reliability of this assessment strategy is an important methodological issue. Reporting bias is a likely confound whenever self-report is the sole measure of adherence. This may result simply from the increased attention and importance attributed to the behavior, influencing the measure to an unknown extent. Blackwell (1976) reviewed several adherence studies that employed both self-report and objective measures. Significant discrepancies were demonstrated between the measures, with self-report indicating higher adherence levels than the objective measurement strategies. Another difficult consideration is the complexity of adherence. As Dunbar (1980) has stated, the clinician is concerned not only with whether the prescribed activity was performed frequently enough, but also with whether the prescribed activity was performed accurately and at the correct intervals.

Typical assessment strategies have included unobtrusive pill counts, patient interviews, laboratory measurement of the drug or a marker in serum or urine, clinician's ratings, the patient's daily records, appearance at scheduled appointments, and clinical outcome. Each method introduces its own biases, requiring different considerations when evaluating research results. For example, pill counts provide information on the number of pills consumed (if no deception is involved) but give no guarantee that the medication was taken at the appropriate intervals or in the appropriate dose, both clinically important issues.

Francis, Korsch and Morris (1969) maintain that subtle, non-threatening questions about treatment adherence during patient's office visits provide generally honest responses. However, this method cannot insure against forgetfulness. Gordis' (1976) review of the interview as an adherence measure supports the notion that adherence tends to be overstated and non-adherence understated.

Clinicians' assessments of adherence were found by Caron and Roth (1968) to be significantly overestimated. Correlations between physician's rating of inpatients' adherence to an antacid regimen correlated .01 with actual medication consumption.

While markers and metabolites provide the most objective assessment method, they are subject to serious shortcomings of their own. Most basically, individual metabolic rate influences serum and urine drug concentration to such an extent that biochemical assays cannot provide the valid, specific information required. Additionally, body fluid concentrations provide a measure only of recent consumption of the drug. Consequently this is a measure of adherence over a period of no more than a few hours.

While it is tempting to use treatment outcome as a compliance measure this approach confounds two distinct phenomena. Response to medical intervention may be a function of several factors in addition to treatment adherence. A good example of this is the Sackett, Haynes, Gibson, Hackett, Taylor, Roberts, and Johnson (1975) study of 134 steelworkers treated for hypertension. They found that only 2/3 of those with high rates of compliance (at least 80% of prescribed medication)

achieved blood pressure control (diastolic pressure below 90 mg Hg). Although one might predict that the good adherers would achieve a good response and the poor compliers poor control, in fact only 54% of the sample fell into these categories. Thus, using treatment outcome as an adherence measure, is an unsuitable strategy.

Daily, client maintained, monitoring of the health-related behavior(s) has been supported as a satisfactory compliance measure, especially in diet regimens, by Dunbar and Stunkard (1979) and in medication regimens by Zifferblatt (1975). Clearly, however, there are biases introduced in this strategy as well. Self monitoring is a variation on self-report and, as such, is subject to both omission and commission errors and outright deception. Further, one may simply be measuring compliance with record-keeping. And finally, for the same reason that the reactive effect of self-monitoring is employed as an active ingredient in behavior change strategies (Kazdin, 1974), its employment as an assessment strategy impinges on the external validity of research findings.

Because these assessment strategies are all of limited reliability, many investigations focus on program attendance, keeping of referral appointments and maintenance of treatment appointments. While attendance measures apparently reflect a different complex of behaviors than, for instance, medication-taking there is logical support that they are related to these more private adherence behaviors.

Extent of the Problem

A review of the literature demonstrates the magnitude of the adherence problem. Emergency room referrals to clinics are reported to result in completed appointments from a low of 25% to a high of 94% of the time (Eisenthal et al, 1979; Wilder, Plutchnik & Conte, 1977). The data from community mental health centers reveal that between 37-45% of the outpatients drop out of treatment after the first or second visit (Fiester & Rudestam, 1975). Likewise, Baekeland and Lundwall (1975) in a comprehensive review of adherence in psychiatric settings report that from 25%-80% of clients fail to return for treatment after one or two contacts. In a review of appointment-keeping adherence Sackett and Snow (1979) distinguish between those appointments initiated by the physician and those that are patient initiated. In the former category adherence ranged from 10%-79%, averaging at about 50%, with a generally higher rate when the appointments were made on behalf of children. Self-initiated appointment completion ranges from 55%-84% in various studies, and averages about 75%. These figures support the importance of patient involvement in appointment-keeping adherence.

The majority of studies of compliance to therapeutic regimens have focused on medication compliance. Research on the degree of treatment maintenance observed suggests that between 20% and 82% of patients fail to accurately comply to medical prescriptions (Blackwell, 1976; Dunbar & Stunkard, 1979, Sackett & Snow, 1979). Further, it is assumed that more complex and long-term health promoting and sustaining behaviors are engaged in with even less tenacity. It has been repeatedly observed

that the absence of symptomatology reduces the frequency and consistency of all therapeutic behaviors (Sackett, et al, 1975).

Compliance Research

Assessment issues have made compliance a methodologically difficult area to study, but other factors have contributed to the paucity of theoretically productive data. Early investigations of compliance were developed from an individual differences framework. Researchers attempted to identify personality attributes and demographic characteristics that consistently related to adherence. In their review of the literature on dropping out of treatment Baekeland and Lundwall (1975) maintain that several demographic factors, age, socioeconomic status and education, predict patient attrition. However, it is doubtful that these or other demographic variables have an independent relationship to compliance. Rather they are mediated by such variables as comprehension and recall (Ley, 1977). Ley and his colleagues have demonstrated that improving patient understanding and recall by providing simple, written instructions and by periodically ensuring that the patient has comprehended previous communications dramatically improves adherence, negating any relationship between adherence and socio-demographic variables (Ley, Bradshaw, Kinsey & Atherton, 1976; Ley, 1977).

A number of studies have evaluated attitudes and personality traits in relation to compliance. Despite occasional findings that patients with negative attitudes toward authority figures comply poorly (Richards, 1964) little empirical support has been provided for the

thesis that personality characteristics predict adherence. Client characteristics that do relate to adherence are high levels of fear and anxiety (Pender, 1975). Excessive fear regarding the illness may overwhelm the individual with a sense of helplessness and loss of control, thus inhibiting positive health behaviors.

Social support from family and close friends is an important client attribute that positively impacts on compliance. In a critical review of the determinants of compliance Haynes (1979) found that 5 out of 6 studies demonstrated greater adherence among patients whose families were supportive. Social support, operationalized as the availability of a running partner, was also found to enhance adherence to a jogging regimen in a recent study of college women. At the conclusion of the program, the mutual commitment of the partners terminated resulting in a dramatic decrease in adherence to the regimen at a seven week follow-up (King, 1980).

Parallel to this area of research but not integrated with it are a number of theoretical formulations that have been developed to explain health behaviors. The oldest and most prominent of these is the Health Belief Model (HBM) developed in the early 1950's by a group of social psychologists working in the U.S. Public Health Service. They were attempting to predict the likelihood of an individual engaging in a recommended preventative health action (Becker, Maiman, Kirscht, Haefner, Drachman & Taylor, 1979). The concept has undergone some modification since that time, but it continues to be based on the decision-making concepts of valence (positive or negative value) and

subjective probability (the individual's estimate of the likelihood of an occurrence). This model maintains that whether an individual will undertake a recommended health action is determined by the individual's perceptions of: 1) level of personal susceptibility to a particular illness or condition; 2) degree of severity of the consequences (physical and/or social) which might result from contracting the illness; 3) the efficacy of the health action; 4) physical, psychological, financial and other barriers or costs related to initiating or continuing the relevant behavior. The HBM also stipulates that a stimulus to action must occur to trigger the appropriate behavior by making the individual consciously aware of his/her feelings about the health threat. These stimuli may be either internal (symptoms) or external (environmental reminders). Although the importance of structural and sociodemographic variables is recognized, they are not considered causal to compliance.

A number of studies (Becker, Maiman, Kirscht, Haefner & Drachman, 1977; Sackett, et al, 1975), have attempted to demonstrate the relationship between the attitudes incorporated in the HBM and health related behaviors. While some aspects of the HBM do seem to be related to adherence, the relationships are generally small to moderate, accounting for only a trivial amount of the variance. As noted by Azjen and Fishbein (1977) general attitudes measured prior to action, such as those incorporated within the HBM framework, have little value in predicting behavior. Further, there is ample evidence (Becker, et al, 1977; Rogers & Shoemaker, 1971) that attitudes do not necessarily

precede actions but may, in fact, develop in a bi-directional interaction with behavior.

In a study designed to evaluate the interaction of beliefs and actions, researchers at McMaster University (Becker, et al, 1979) assessed steelworkers recently identified as having hypertension. Their perceptions of personal susceptibility to developing hypertension, the seriousness of the illness, the benefits of treatment, attitudes toward medication including belief in the safety and efficacy of the medication, and the dependency implications of illness were assessed in a standardized interview. This interview was initially conducted during the hypertension screening phase, before a diagnosis had been made and was repeated six months after the patients were referred and then six months later.

Compliance was assessed at six and twelve months after the screening. Unobtrusive pill counts and interviews constituted the compliance measures. The only pretreatment test of beliefs that correlated with adherence was one that assessed attitudes regarding the dependency implications of illness. Patients who believed that illness does not imply dependency on others were more likely to comply than those who thought illness implied dependency. This finding may be interpreted to suggest that those who maintained a sense of independence or of being in control after receiving the diagnosis of hypertension were more likely to adhere to their medication regimen.

The other four HBM scales regarding susceptibility, seriousness of disease, benefits of treatment and drug safety when measured prior to

treatment did not correlate significantly with either pill count or self-report. However, assessment of these beliefs six months into treatment demonstrated significant correlations between attitudes regarding the seriousness of the disease, drug safety, social dependency and the adherence measures, obtained at the same time (six months) and at twelve months. This result suggests that attitudes do indeed follow actions rather than the reverse. A multiple regression analysis was performed to determine the explanatory power of the Health Belief Model. All the scales were included as predictors. The best result, the correlation between health beliefs at six months and the twelve month pill count, accounted for only 15% of the variance.

Although this study is limited in generalizability by its work site setting, use of subjects without prior illness and the presence of an asymptomatic disease, it is methodologically better than other published investigations of the HBM. The results are consistent with other findings of low correlation between elements of the model and adherence. But this study clearly demonstrates the limited predictive ability of the attitudes included in the Health Belief Model.

In the 1975 study of Becker and Maiman support is assumed for the HBM in predicting children's weight loss from mother's attitude toward general susceptibility, value of diet, etc. It must be noted that the variance they accounted for by the best combination of predictors is less than 15%. Additionally, these correlations decrease with increased time between assessment of the mother's health beliefs and health actions.

According to Dunbar and Stunkard (1979) and Garrity (1980) the aspects of the model that tend to correlate most significantly with adherence are those based on the doctor-patient relationship, barriers to treatment and prior experience with the conduct of the regimen, rather than the attitude variables. This evaluation of the HBM should not be construed as a negative outlook on the development of a theoretical framework for understanding health actions and adherence. On the contrary, the relative sterility of the compliance literature has been attributed (Dunbar and Stunkard, 1979) to the lack of theoretical foundation for the majority of empirical investigations. In what they considered a first effort to develop a unified framework from the multiple models regarding health actions Cummings, Becker and Maile (1980) integrated fourteen models using smallest space analysis (Guttman, 1968). They constructed a pool of 109 variables taken from 14 models of health behavior and had judges partition the sets into 12-14 groups on the basis of similarity. The judges employed were the original model developers. Using smallest space analysis six factors related to health actions emerged from this rational procedure: 1) accessibility of health care; 2) evaluation of health care; 3) perception of symptoms and threat of disease; 4) social network characteristics; 5) knowledge about disease; 6) demographic characteristics.

While this provides no empirical test of the factors, it suggests the multi-dimensional complexity of health behaviors. It is important to note the several variables that did not cluster meaningfully in the smallest space analysis but that seem to be important in their own

right. It should be recognized that in such a multi-dimensional scaling procedure, the failure of a variable to cluster with others reflects disagreement among judges as to where to categorize the variable. Such apparently important variables as cues to action and personal control failed to be located in a consistent relation to the other variables. Several additional variables that have been demonstrated to influence adherence to treatment recommendations were not included in any of the models. For example the provider-client relationship (Ley, 1977; Becker & Maiman, 1975; Francis, et al, 1969), setting variables, such as continuity with the same provider, waiting time in clinic (Wilder, et al, 1977; Fiester & Rudestam, 1975) and degree of patient participation and/or involvement in treatment planning (Eisenthal, 1979) have all been shown to reliably impact on compliance but were not included in any of the 14 models.

Despite the limitations of the Cummings, et al (1980) study, it demonstrates an increased recognition for the necessity of a broad framework within which to investigate initiation and maintenance of health behaviors. An appropriate model of health behaviors must include relevant setting, client and clinician variables such as those previously noted. Additionally, the general characteristics of the therapeutic regimen itself have been demonstrated to influence adherence. In his review of 15 studies Haynes (1979) found that 11 demonstrated a negative impact of regimen complexity on adherence. Additionally, chronicity of the behavior is inversely related to adherence. A

clinician can expect approximately 50% maintenance of health behaviors over long periods of time (Haynes, 1979).

The effect of therapist variables have been repeatedly demonstrated. In the realm of psychiatric adherence and continuation in therapy therapist attitudes and behavior are recognized as pivotal, being implicated in 35 of 35 studies of dropping out of treatment reviewed by Baekelund and Lundwall ((1975). Fiester and Rudestam (1975) performed a multivariate analysis of early drop-outs from treatment at a hospital based community mental health center and a state supported outpatient mental health clinic. They assessed the impact of numerous patient variables, therapist variables and therapy process variables. Despite no overall differences in drop-out rates at the two centers, they found evidence that the drop-out process operated differently in each location. They note intra and inter setting differences that were primarily a function of therapist differences in their interactions with patients. In a study of 800 visits to a pediatric outpatient clinic Francis, et al (1969) examined the effect of the doctor and patient interaction on patient satisfaction and follow-through on medical advice. They also systematically evaluated the influence of parent's education and socioeconomic status on compliance to medical advice, but found no significant relationships. They provide support for the importance of the affective or expressive role of the physician in determining patient satisfaction. Satisfaction itself was complexly related to treatment adherence with the extremes of satisfaction being significantly related to adherence.

In one of the earliest investigations into the issue of doctor-patient communication Davis (1968) concluded that to insure a patient will follow his advice the doctor must "continually explore and diagnose social and psychological facets of his interactions with patients." (p. 284).

While a number of authors (Barofsky, 1979; Becker & Maiman, 1975; Dunbar & Stunkard, 1979; Eisenthal, et al, 1979; Hulka, 1979) have recognized the importance of the interaction between the provider and client, this interactive variable has been relatively ignored in the models of health behavior. Hulka (1979) attributes this to the difficulty of specifying measurable aspects of the relationship. In a study of cardiac and diabetic patients treated as outpatients by primary care physicians, Hulka attempted to define the relevant aspects of this relationship. Employing a summary of information the physician reported as his/her communication and another summary of information the patient recalled receiving she assessed the information effectively communicated from physicians to patients, the degree of physician awareness of patient concerns and patient satisfaction in this sample of cardiac and diabetic patients. The importance of these variables was evaluated through correlational analysis with 4 distinct types of medication errors. Efficacy of overall communication scores was significantly positively associated with proper adherence for cardiac but not for diabetic patients. However, specific information did relate to proper adherence by the diabetic patients. There was a general, but not

significant trend for patient satisfaction to relate to medication adherence.

In one of the first studies to explicitly recognize the changing normative expectations in the provider-client relationship Eisenthal, et al, (1979) conducted a study of adherence to treatment referrals made in the psychiatry walk-in clinic of a general hospital. The primary variable of interest was clients' rating of the style of the initial interview. All therapists were familiar with the negotiated approach to interviewing in which the patient's unique perspective and preferences are acknowledged and legitimized by the clinician. The patient's participation is solicited and an attempt is made to establish the patient's sense of involvement in treatment decisions. Eisenthal, et al, had 120 patients complete a pre-interview questionnaire regarding demographics, etc. and a post interview evaluation requiring them to rate the interviewer's style, understanding, knowledge, etc., and their satisfaction, felt improvement, etc. A Negotiation Index was obtained from these responses that reflected the degree to which the patient felt s/he had participated in the treatment plan, been helped to verbalize his/her request, etc.

Subjects who gave higher ratings on the Negotiation Index were significantly more likely to attend their referral appointment. Two of the four measures in the Negotiation Index significantly differentiated between adherent and non-adherent subjects: Patient participation in the disposition, $p < .023$, and clinician understanding of patient request, $p < .031$.

Additionally four outcome measures, (satisfaction, feeling helped, feeling better, and getting the treatment plan wanted) correlated significantly with the ratings of negotiated approach and ratings of diagnostic understanding. This finding replicated an earlier study of the subjective-perceptual responses to a negotiated interview approach (Eisenthal & Lazare, 1976).

Eisenthal, et al, (1979) attempted to further elucidate critical aspects of adherence, demonstrating a complex relationship between adherence and patient satisfaction. Analysis suggested that adherence is related to a problem or task-centered, rather than a feeling centered approach to the conduct of the interview. The negotiation variable best correlated with adherence, participation in the treatment planning had a notably weaker, but still significant relationship to satisfaction.

These findings suggest the importance of further specifying the active ingredients in this "negotiated" style of the initial interview and treatment. The concept of the negotiated approach is theoretically consistent with the model of health self-care advocated by Barofsky (1979). He maintains that the preconditions for self-care require receptive providers and an appropriate context (normative expectations and setting structure). The development of a workable model of self-care requires that the patient's request for treatment be based on his/her perceptions of bodily processes, and that these perceptions be legitimized by the clinician. The importance of self initiated health care is increasingly recognized as fundamental to the improvement of the health of industrialized nations. However, an empirical demonstration

of the efficacy of health interventions based on the self-care model remains to be conducted.

Although it can be argued that the provider-patient relationship, from its inception is unbalanced with the power predominantly in the hands of the provider as the expert, patient status also has some aspects of power and control. Within the current medical paradigm these are overlooked, but in a basic sense the role of provider is dependent on the patient role. Nonetheless, Barofsky (1979) and others have maintained that "At the core of the phenomenology of all patients is a sense of loss; a sense of losing personal control over oneself in order to become part of a system that can restore health, but by unfamiliar methods." (p. 372). Barofsky maintains that the assumption of personal responsibility for health as reflected in the self-care model may serve to reduce the incidence of iatrogenic illness. This, however, is only one important outcome of a model in which the patient is the manager of his/her health care. The mutuality inherent in this dyadic provider-patient model is consistent with the apparent direction of the developing paradigm in health. There is considerable research and theoretical foundation supporting the importance of the perception of control in maintaining difficult behaviors and ensuring positive mental health.

Perceived Control

Seligman, Klein and Miller (1976) have developed an extensive theory of the etiology of reactive depression based on the individual's perception that s/he has no control over reinforcement. This notion

developed from research findings that animals prohibited from escaping aversive situations eventually relinquish all further attempts to avoid punishment or seek reinforcement (Seligman and Maier, 1967). They exhibit an apparent sense of helplessness, ceasing exploratory behavior and attempts to manipulate their environment. This behavior is similar to that of the depressed individual who frequently endorses the belief that his/her behavior is meaningless and personal power is absent. Although studies of induced human helplessness are limited by ethical and moral considerations, the possibility that this condition develops during hospitalization has been investigated (Raps, Peterson, Jonas & Seligman, 1981). Performance on cognitive tasks decreased and depressive symptoms increased with length of hospitalization, despite the resolution of the patient's medical problem. Langer and Rodin (1976) provide evidence for the physically debilitating effects of loss of control as well as the health facilitating effect of increased responsibility and control over daily activities among nursing home residents. Certain residents were encouraged to believe that they could affect their surroundings and were allowed to make choices about their activities. Others were offered the same satisfactions but without any sense of active decision making, participation or control. In subsequent evaluations by nursing staff and the residents themselves the perceived control residents were rated as significantly more active and happier. Follow up investigation (Rodin & Langer, 1977) revealed that these residents lived longer than did those who had been offered the equivalent satisfactions as part of the nursing home's services.

A number of other studies have supported the value of providing the institutionalized aged with a sense of competence and control. Schulz and Brenner (1977) and Schulz and Hanusa (1979) have demonstrated this by showing improved memory and cognitive performance, increased activity levels, improved health and decreased mortality as a function of enhanced perception of control. The individual's sense of control is strengthened by allowing him/her simple choices related to daily activities. It is difficult to separate the effects of competence from that of control in this area of research because the implicit, if not explicit, message of giving people control over decisions they have been denied is that they are sufficiently competent to make the decisions or choices.

An area of research that has investigated situational loss of control is that of reactance. Brehm (1966) conceptualized reactance as a resistance to a social influence process in which the individual experiences a threat to his/her freedom to act or decide in a particular way. The number and importance of the free behaviors threatened or eliminated have a direct influence on the degree of reactance experienced. While a justified or legitimate denial of freedom may diminish the magnitude of reactance Brehm asserts that the loss of freedom, no matter how legitimate, still creates reactance, a motivational state directed toward the reestablishment of threatened or eliminated behaviors. The behavioral consequences of reactance are the converse of those observed in learned helplessness, the individual attempts either directly or indirectly to reassert his/her control. S/he may reaffirm

freedom and control by engaging in the threatened behavior or may "boomerang", acting in a manner opposite that originally desired.

The relevance of such oppositional behavior to health care is obvious to any practitioner who has observed his/her injunctions opposed despite their acknowledged validity. In an attempt to theoretically order the everyday assumptions and "rules" by which patients assemble their world of health care action, Hayes-Bautista (1976) maintains that an underlying issue in non-compliance is the patient's need to demonstrate control within the doctor-patient relationship. This is not to suggest that every instance of non-compliance is a result of a struggle for control. The individual's expectation mediates the impact of the situation in which one person (the expert) directs the behavior of another (the client) (Jones, Worchel Goethals, & Grumet, 1971). Unquestionably, the societal expectation with regard to a health-care provider is that s/he will "tell the patient what to do". The problem arises, according to Hayes-Bautista, when the client is dissatisfied with the treatment plan. S/he is then faced with the options of modifying the treatment with or without the "expert's" knowledge, of acquiescence to the treatment, and of dropping out of treatment. The previously presented research and theoretical formulation support the value of attempts to modify treatment in interaction with the health-care provider through convincing and bargaining strategies. However, at least two issues mediate against the likelihood and effectiveness of such patient negotiation. First is the clinician's investment in his/her evaluation. Additionally, treatment and cultural

norms predicate against the success of mutually initiated negotiations. The failure of a patient to obtain a satisfactory treatment plan will usually result in non-compliance and/or dropping out of treatment.

The previous discussion provides a possible explanation for the positive effect of "getting the treatment plan wanted" on patient adherence in the Eisenthal et al's (1979) study. While valuing this result may be viewed as contradictory to the assumption that the physician has expertise exceeding that of the patient, and as valuing the client's role in dictating treatment, this is not the case. That is to say, a patient's post-interview report that s/he got the disposition wanted does not imply that the physician offered a recommendation identical to the one the patient had in mind prior to the interview. Rather, patients are reporting a perception of having a plan they want. There is no medical reason that the job of the health care expert in enhancing adherence is basically different from that of a promoter attempting to ensure use of his/her products. The development of a perceived need for the "product" is basic to both endeavors. Clearly, approaches that are experienced as a threat to personal control will be unsuccessful at ensuring continued "product" utilization. The aspects of a negotiated approach to care include assessment and validation of client's problems and requests. This provides the clinician with sufficient information to design a treatment package that, within the limits of appropriate treatment, is tailored to the needs and desires of the client. Theoretically, the client's opportunity for making such

valued decisions will lead to enhanced motivation to manage treatment successfully.

The value of perceived control over situations has been demonstrated in other areas as well. Liberal educators have long maintained that learning is enhanced by engaging the student in the learning process, by providing him/her with the opportunity for input and choice about subject matter and class format. Brigham (1979) has demonstrated that fifth grade students worked faster and completed more work when allowed to set their own goals than when they were set by the teacher. Likewise, when students in an academic preschool were allowed to make their own choice of math games to play upon completion of assignments their speed in completing assignments accelerated dramatically. While these and other classroom demonstrations of the importance of student choice and involvement serve to substantiate the effect of choice and perceived control on learning and performance, it is difficult to separate the effects of teacher expectancy, competence enhancement and choice of reinforcers from that of choice per se.

The well-controlled, systematically developed investigations of Perlmuter and Monty have provided evidence for the effect of choice and perceived control in enhancing learning and performance. They have generally employed the paired associate learning task to demonstrate the effects of choice on performance and learning of word pairs. Basically two conditions are used. In the choice condition subjects are shown a slide with a set of verbal materials consisting of a single stimulus word on the left and five potential response words on the

right. Choice subjects are allowed to select the response word they want to learn. Force subjects are yoked to choice subjects, and assigned the same response word chosen by their yoked choice subject. Typically 10-14 such word pairs are employed. Subjects then proceed to learn the word pairs by the traditional anticipation method. They are shown the stimulus word and asked to recite the response that was paired with it. Then the stimulus and correct response are presented on the slide. The dependent variable is percentage of correct responses in a predetermined number of trials and/or the number of trials required to learn the list to criterion. Perlmutter, Monty and Kimble (1971) demonstrated that choice subjects learned more rapidly and to a higher level than did force subjects. To control for the possibility that preferential associative hookups are formed by the choice subjects Monty and Perlmutter (1975) demonstrated that choice is equally effective when subjects choose either the stimulus or response in the absence of the other. The effect of choice on enhanced performance was demonstrated by Monty, Rosenberger and Perlmutter (1973) to be sustained even when only 3 choices were allowed from a 12 item list, as long as the choices were made early in the procedure. This corroborates the notion that choice acts as a setting event, defined by Kantor (1959) as antecedent stimulus-response interactions that affect the frequency, quality and topography of responses that follow.

In subsequent research, Monty, Geller, Savage and Perlmutter (1979) have demonstrated that it is not choice per se, but the perception of an opportunity for making a meaningful choice that leads to enhanced

motivation and improved performance. That is, the perception of control resides not in the act of choosing but in the anticipation of the opportunity for choice and the development of the perception of control (Savage, Perlmutter, and Monty, 1979).

A number of psychologists have developed entire theoretical systems around the concepts of control motivation. DeCharms (1968) maintains that "Man strives to be a causal agent, to be the primary locus of causation for, origin of, his behavior; he strives for personal causation," (P. 269). Such theoretical statements and the findings from the investigations of learned helplessness and perceived control implicitly or explicitly support the existence of a motive to control the events in one's environment. To the extent that expectations and desire for control are important psychological dimensions, individual differences in control motivation should help account for variation in human behavior.

Social learning theorists maintain that behavior is a function of the expectancy for reinforcement in a particular psychological situation and the value of that reinforcement to the individual (Rotter, 1975). While acknowledging the powerful nature of situational variables, Rotter and his associates developed a scale for distinguishing individual differences in the general expectation for control in situations. Individuals who attribute the receipt of reinforcements to causes beyond their control, e.g., luck or fate, are said to have a belief/expectancy in external control; those who interpret events as contingent upon their own behavior are said to have a belief in internal control (Rotter,

1966). This attribute is thought to be distributed in a manner approximating a normal curve, although it has been treated in the literature as though it constituted a bimodal distribution (Rotter, 1975). A vast number of studies have attempted to define the relationship between scores on scales reflecting this expectancy for control of reinforcements and virtually all aspects of behavior (Lefcourt, 1979; Rotter, 1975; Strickland, 1978). Internals will theoretically exert more effort to influence their environment by engaging in more active coping, seeking relevant information, etc. than will externals. Findings from a broad range of studies demonstrate generally greater adaptive functioning for those persons holding internal as opposed to external expectancies (Strickland, 1978). However, there are a substantial number of inconsistent findings as well.

Kirscht (1972), Wallston, Wallston, Kaplan and Maides (1976) and others have attempted to refine the methodology as it relates to health behavior by developing scales that relate specifically to control expectancies and motivations regarding health. Kirscht (1972) demonstrated differential relationships between positive health behaviors over a one year period and health expectancy versus health motivation questions. Dabbs and Kirscht (1971) in a study of inoculation against influenza, found that college students assessed as internal on eight "motivational" variables were more likely than externals to have been inoculated, but internals on eight "expectancy" variables were not any more likely than externals to have taken the shots.

Despite this finding, the most widely used scale assessing control over health addresses the issue from the perspective of a person's expectancies for control with regard to health (Wallston, et al, 1976). With some exceptions, the bulk of the reported research on health locus of control and precautionary health practices lend support to the theoretical assumptions that internals are more likely to assume responsibility for their health (Strickland, 1978). It should be recognized that despite statistically significant findings the practical significance of the effects, i.e., the variance accounted for, is often minimal. Consistent with the assumptions of social learning theory, and reflected in the Health Belief Model discussed previously, the value a person attributes to health will also influence such behaviors.

Desire for Control Scale

In an attempt to directly assess motivation as compared to expectancy for control, Burger and Cooper (1979) developed a 20 item scale with acceptable levels of internal consistency (.80), and test-retest reliability (.75), as well as discriminant validity from Rotter's (1966) Locus of Control scale and the social desirability scale (Crowne & Marlowe, 1960). Construct validation was demonstrated in studies of illusion of control and attitude change (Burger and Cooper, 1979; Burger and Vartabedian, 1980), in which subjects' behavior was consistent with predictions. The illusion of control study was a manipulation of the time at which subjects were allowed to place a bet. Subjects in the 'bet before' condition were permitted to place their bets before rolling

the dice, in the 'bet after' condition they were required to roll the dice, keep them covered and then bet. It was hypothesized that the 'bet before' situation created an illusion of control over chance outcomes. Further, they theorized that subjects high in motivation for control who obtained a score one standard deviation above the mean on the Desire for Control scale would respond to the 'bet before' manipulation by making larger bets than low Desire for Control subjects. This hypothesis was confirmed ($p < .05$). The hypothesis of the attitude change investigation (Burger and Vartabedian, 1980) was that subjects high in Desire for Control (DC) would reject speaker's arguments that were counter-attitudinal and accept proattitudinal arguments. For low DC subjects the persuasiveness of the arguments should play a dominant role in determining the amount of attitude change. Subjects were divided by a median split into high and low motivation for control based on their DC scores, and pro and con positions on the Equal Rights Amendment. The above hypotheses were supported, with more high DC subjects than low DC subjects persuaded in the initially agree condition ($p < .05$) and more low DC than high being persuaded in the initially disagree condition ($p < .05$).

Additional investigations of this scale have not been reported in the literature. It appears to have predictive validity in the general perceived control situations. However, its relevance to the health care setting has yet to be demonstrated.

Conclusions

Non-adherence has been shown to be a significant problem in all health care settings, one that frequently, but to an unknown extent, compromises the efficacy of medical interventions and health maintenance programs. The definitional and methodological problems inherent in most adherence research have resulted in our gaining little systematic understanding of the problem. The research findings have, however, eliminated the likelihood of a direct relationship between adherence and demographic and personality variables. Additionally, practical considerations such as accessibility of care and complexity of the therapeutic regimens have been demonstrated to have a clear relationship to adherence. Further, the clinician's "expressive role", communication of warmth, understanding of the problem, and willingness to allow the client's participation in decision-making, has been implicated as an important determinant of compliance. While it may be desirable for all clinicians to possess these qualities, they are very difficult to define specifically. In order to systematically improve adherence, one must be able to clearly specify what the style and components of the clinician-client interaction are. Additionally, clients' individual differences may require different styles of interaction.

The importance of interaction variables has not been conceptualized within a theoretical framework of adherence behavior. The area of perceived control appears to provide the best integration of the findings regarding the effect of provider-client interactions on adherence. Although direct assessment of the perception of control is

as difficult and vague as the assessment of clinician style the perceived control literature suggests clear strategies for operationalizing this construct. The provision of the opportunity for meaningful choice in the initial stages of an interaction is an accepted operational definition of providing a perception of control.

Purpose

The present study attempted to investigate the effects of a clearly operationalized perception of control manipulation on adherence to a health promotion program. The effects of individual differences in motivation for control were assessed to evaluate the interaction of program style and individual preference for control.

The behavior of interest was program attendance and home practice of relaxation exercise. Relaxation was chosen as the health activity because it has significant potential as a health maintenance strategy, it is simple to teach to subjects in a cost-effective group setting but it requires regular practice to be effective. The program was offered in a work-site setting because of the demonstrated value of convenience in improving adherence and because of the acknowledged importance of the work-site as a fundamental health care promotion setting.

Relaxation has been demonstrated to be effective in reducing perceived stress and generalizes well from the clinical setting to various aspects of daily life. Its use has been accepted by the lay public as an important mental and physical health skill without

connoting the status of patient or illness, thus it is an excellent self-care skill for people to develop.

Progressive relaxation has a long history within psychology (Jacobson, 1929) mainly in systematic desensitization treatment with phobic clients (Turner, Calhoun & Adams, 1981). It was not until the early 60's when American subculture discovered Transcendental Meditation that the general public became familiar with a type of relaxation. The Relaxation Response (Benson, 1975) was demonstrated to be a normal physiologic state that virtually all people can elicit. Relaxation techniques are all characterized by a limitation of stimulus input which the individual achieves by focusing the attention on a narrow range (e.g. relaxed muscles) or a constant stimulus (e.g., a mentally repeated sound or the breathing). These methods elicit a wakeful hypometabolic state consistent with decreased autonomic activity (Lehrer, Schoick, Carrington & Woolfolk, 1980). This physiology, the opposite of the stress reaction, is hypothesized to be the mechanism by which regular practice of relaxation exerts its health promotion effects.

Progressive relaxation (tension release) is a somatically oriented technique, requiring close attention to somatic sensations, particularly muscle tension. It is effective in reducing constant as well as acute levels of muscle tension (Miller, Murphy and Miller, 1978; Sime and DeGood, 1977), reducing blood pressure in medically treated and non-treated patients (Fey & Lindholm, 1976; Roskies, Kearney, & Spevak, 1979), reducing cardiac stress reactivity (Lehrer, 1978; Lehrer,

et al, 1980), and reducing serum cholesterol (Roskies, 1979; Roskies, et al, 1979).

The potential of relaxation for moderating the physiological stress response so frequently implicated in chronic medical illness is substantial. Given the frequently high levels of stress in the workplace and the monumental organizational cost of stress-related illness the limited use of relaxation programs is somewhat surprising. Peters, Benson and Porter (1977) first demonstrated the efficacy of a worksite relaxation program in reducing self-reported anxiety, reducing blood pressure and in improving self-reported general well-being.

More recently, Carrington, Collings, Benson, Robinson, Wood, Lehrer, Woolfolk and Cole (1980) investigated the relative efficacy of three approaches to relaxation with 154 New York Telephone employees self-selected for stress. They demonstrated a superior effect for the mental relaxation approaches over the progressive muscle relaxation in symptom and anxiety reduction. However, Borkevec (1979) has noted that very brief training in progressive relaxation such as that received by subjects in this investigation, may not be adequate to produce significant reductions in autonomic activity. Subjects in the Carrington, et al, study received tape-recorded instructions and practiced the relaxation exercise in their own homes. Two weeks after receiving the tapes they met in a group with a psychologist and discussed any problems they had experienced, ways to adjust the technique to suit their personal needs, etc. Self-report measures are used through-out the study. At the third measurement, 5.5 months after the

subjects received the tapes, 25% of the subjects reported discontinued use of the procedure, with the progressive muscle relaxation subjects having the highest attrition rate.

This investigation at New York Telephone makes a significant contribution to the literature on work-site stress reduction programs. It does raise a number of questions however. With regard to adherence, the lack of interpersonal instruction may have contributed significantly to the discontinuation of practice. Additionally, the reliability of the self-report measures might be validated in one of several ways, strengthening the findings. There is one outcome that supports the validity of the self-report. That is that subjects who reported any practice of relaxation also reported significantly fewer physical complaints than those who were not practicing.

In sum, adherence to a relaxation exercise regimen promotes individual well-being and health. Additionally, such a regimen has value in managing stress related illnesses and symptoms such as hypertension, cardiac arrhythmias, headaches and fatigue. This suggests the cost-effective value of teaching relaxation in the workplace.

In the present study it was predicted that subjects who were high in motivation for control would adhere significantly better to a program format that enhanced their perception of control than in a standard program format. Conversely, subjects low in the motivation for control were predicted to adhere best to a standard clinician-controlled format. Further, it was expected that the setting variables would exert more

influence than individual traits suggesting that overall adherence would be greater in the perceived control condition.

METHOD

Subjects

The subjects were sixty staff and faculty, aged 20 to 64 years currently employed at VPI&SU. They were recruited for the Relaxation program by announcements in the staff/faculty newspaper and by means of flyers distributed to a random 2000 employees of Virginia Tech. Thirty seven women and twenty-three men were involved in the program. Their occupations were categorized for the purposes of the study into clerical-technical staff, faculty and administrators. In these, 24 clerical, 15 faculty and 21 administrators participated. All were employed on campus or within two miles of the main campus.

Participants were given the option of receiving the program for a standard forty dollar fee or participating in the research aspect of the program. All opted to participate in the research, agreeing to complete a number of forms and to have a brief interview at the conclusion of the program.

Apparatus

Two progressive muscle tension relaxation tapes were employed. Both tapes are recorded in the same female voice and are 22 minutes in length. The tapes have been demonstrated to be functionally identical in their ability to induce a state of relaxation. However, there are procedural differences in the tapes. For example, one approach directs subjects to tense arm and leg muscles by extension while the other

employs an isometric tensing method. Previous experience with these tapes provided evidence that these differences were noted by subjects and frequently resulted in subjects' having a preference for one approach over the other. Neither tape was consistently preferred over the other.

Measures

Adherence to four tasks was evaluated. The primary measures of adherence were attendance at the training and practice sessions. Subjects were expected to attend three training sessions and were given the option of attending up to four practice sessions. Adherence measures of secondary interest are two self-report forms. The first, the Relaxation Practice Record (Appendix A), allows the subject to record when and where s/he practiced the Relaxation exercise, and the duration of the practice. The level of stress pre and post practice were self-rated. These were completed following relaxation in the training and practice sessions and returned to the experimenter. Additionally, subjects received a supply of these forms at the orientation so they could complete one each time they practiced at home. They were required to return forms completed outside of the sessions to the experimenter via the Campus mail. The second self-report is the Health Assessment form (Appendix B) developed by the experimenter. It is comprised of a symptom checklist and a scale for rating quantity and quality of productivity. Subjects were requested to complete this on the day prior to their scheduled relaxation training session, and to bring this with them

to the meeting. This was also completed a final time as part of the post evaluation. The Desire for Control scale (Burger and Cooper, 1979) (Appendix C) was employed to classify subjects by a median split, as either high or low in motivation for control. This questionnaire was administered prior to the orientation as part of the application form.

Measures of secondary interest are those used to define the subject population. Demographic information and scheduling preferences were obtained on the application form (Appendix D). The anxiety scale employed was the State Trait Anxiety Inventory - Trait Version (STAI) (Spielburger, Gorsuch & Lushene, 1970) (Appendix E) was administered at the orientation and again as part of the post evaluation. The Health Locus of Control (Wallston, Wallston, Kaplan & Maides, 1976) (Appendix F) was used to assess subjects' beliefs and expectancies regarding their health. This was administered at the orientation and as part of the post-evaluation. The General Information Form (Appendix G) was completed during the orientation. Subjects rated their experience in previous similar programs such as exercise, meditation, etc. on questions of success, frequency and duration of practice. Additionally, subjects rated their prior adherence behavior to medical recommendations and briefly evaluated their health. An additional measure completed during the orientation and at the post evaluation was the Problem Identification form (Appendix H). Subjects were asked to rate the severity and frequency of three health problems they hoped relaxation would ameliorate. An experimenter-designed measure, the Post-Assessment Questionnaire (Appendix I) was completed as part of the post assessment.

It assessed the perception of control experienced, differences noted between the tapes, subject satisfaction and fulfillment of expectations. Two copies of the consent form (Appendix J) were signed in the orientation. One was retained by the subject. This granted the experimenter permission to use all returned materials for research purposes and to tape the final interview.

Procedure

A program announcement was carried in the Staff/Faculty newspaper at VPI&SU. Additionally, a random 2000 Virginia Tech employees were sent a program flyer which they could fill out and return to indicate their interest. A number of individuals phoned to express interest in the program. All interested persons were sent an application to complete and return to the experimenter. The application form included the Desire for Control scale and the participant's preference of meeting times. Subjects were classified on the basis of their Desire for Control score by means of a median split. Thus one-half were designated as high in desire for control and half as low in motivation for control. One half of the subjects in each classification were assigned randomly, within the limits of scheduling restrictions, to either the Perceived Control (PC) condition or the Standard Program (SP) condition.

The design employed was therefore a 2(low/high desire control) x 2 (perceived control/no perceived control) factorial in which Desire for Control score is a subject variable and perceived control is an experimenter assigned condition.

There was a total of eight (8) meetings for each subject. This included a 45 minute orientation session, three (3) training sessions, each 50 minutes long, and four (4) practice sessions of approximately 30 minutes. Subjects attended the orientation and training sessions on the basis of assigned condition. A total of four groups were conducted, two in each condition. The PC groups were held at 7:30 a.m. (n = 12) and 12:00 noon (n = 18). The SP groups were conducted at 12 noon (N = 16) and 5:00 p.m. (n = 14). All groups met in the same room on the main campus of Virginia Tech. Padded, straight-back chairs were provided for subjects. The room was in a relatively quiet building at the end of a hall. The shades were usually drawn during the relaxation period and the lights were turned off, leaving the room semi-dark.

The experimenter conducted all sessions and conducted all final interviews. In the third (choice) training session a female graduate psychology student assisted the experimenter. All experimental manipulations were conducted during the orientation session. Subjects in both conditions received the following measures to complete at the orientation: Consent forms (2), State Trait Anxiety Inventory (Spielburger, et al, 1970), Health Locus of Control (Wallston, et al, 1976), General Information Form, and the Problem Identification form. The experimenter then presented general information on the stress and relaxation responses and an explanation of how regular practice of relaxation promotes short and long term health. She then had subjects review the symptoms they had identified on the Problem Identification form. In the Perceived Control condition the groups were specifically

told that relaxation would help them gain control over these stress related problems. All groups received the same explanations of the effect of relaxation on stress related symptoms based on empirical data from research on relaxation and the physiology of the stress and relaxation responses. The perceived control groups then received an explanation of how relaxation puts them in control of their responses to everyday stresses and provides them with knowledge that they are gaining control over their long range health.

The program format was then discussed. Subjects were told they would hear one progressive relaxation tape in the first session and a different one in the second session. The PC groups were then told they would have their choice at the end of the second session of which tape they preferred to hear in the third session. The SP groups were given no opportunity for choice but were told that to balance the numbers of people hearing each tape part of each group would hear tape A and part tape B in the third session.

The PC groups were encouraged to use the tapes to their best advantage. They learned that in the third training session they would schedule their practice sessions and would be told which tape would be used for each session so they could schedule practices in order to hear the tapes they preferred or if they desired, to alternate tapes, thereby gaining experience with both approaches. The SP groups were told that they would schedule their practice sessions in the third training session and that tapes would be alternated over practice sessions so they would randomly have experience with them both.

All groups were told that regular practice of relaxation was an essential aspect of its efficacy. They were encouraged to practice daily while they were mastering the technique and thereafter to practice at least three times a week. Subjects were cautioned not to eat a heavy meal within two hours of practicing relaxation. They were reminded to complete the Health Assessment form on the evening prior to their first training session.

The information and format of the training sessions were identical for the PC and SP groups. Administration of the tapes was counter-balanced between conditions. The first training session dealt with the components of the exercise itself and included some modeling of the tension exercise to be presented. Instructions about how to practice relaxation were given. Subjects were reminded to complete the Health Assessment form prior to the next session and encouraged to practice relaxation at home or work, completing a Relaxation Practice Record (RPR) when they did.

Following this presentation, all subjects then filled out part of the RPR, rating their tension level at that time. Subjects were instructed to make themselves comfortable, the tape was started and all participants engaged in relaxation exercise in response to the tape. Following this they completed the RPR's, noting their post-relaxation tension level. Any questions were answered and the session was concluded.

The second training session was similar to the first. Subjects heard a different tape from the one heard previously. The instruction

focused on early identification of elevated tension levels, determining early signs and symptoms. The PC group was reminded that they would have the opportunity to choose their preferred tape at the end of the session. The experimenter reminded all groups of the tension release approach used on the first tape and outlined the differences they would note in the tape they were about to hear. Following training the PC groups signed up for the tape they preferred to hear in the third session.

A female psychology graduate student was introduced as an assistant in the third training session. The instruction focused on determining the level of tension necessary for the activity one is engaged in. Subjects were taught to identify and release unnecessary tension while engaged in a task. Following the instruction and any discussion it generated subjects were divided according to the tape they would hear. Equal numbers of PC and SP subjects heard each tape. A nearby room was employed to administer one of the tapes, with the assistant in attendance.

Following the training all subjects returned to the same room. Schedules of practice sessions were made available and everyone was encouraged to schedule four sessions. In the PC groups the tape that would be employed was noted by the date and time of each practice session.

Practice sessions were held at 12 noon and 5 pm for nine days. Additionally, five 7:30 a.m. sessions were held during this period, resulting in a total of twenty-three possible sessions over a nine day

period. Relaxation Practice Records were collected at each session and subjects practiced relaxation to one of the two relaxation tapes. PC and SP subjects participated in the same practice sessions.

At the conclusion of the program each subject was sent a Post-Assessment Questionnaire comprised of the State Trait Anxiety Inventory, Health Locus of Control, Post Assessment Questionnaire, Health Assessment form, and a Problem Identification form. Each subject's original symptoms had been filled in on the Problem Identification form. They were requested to rate the current frequency and severity of each. At this time all subjects were contacted to schedule a final interview. These fifteen minute interviews were conducted over a period of two weeks. The interviews were structured to obtain an evaluation of several issues in a format that allowed clarification of answers. The reasons subjects enrolled in the program, the average number of times they practiced at home and difficulties encountered, the number of sessions necessary for learning relaxation and strong and weak points of the program were all assessed. An attempt was made to assist subjects with any questions or problems they encountered with relaxation. The Post Assessment Questionnaire was collected at the time of the interview.

RESULTS

A total of 60 subjects were involved in this research, 30 in each of the treatment conditions. Within each condition there were two groups. Due to scheduling limitations the groups were of different sizes. The two Perceived Control groups met at 7:15 a.m. and 12 noon and had 12 and 18 subjects, respectively. The Standard Program condition groups met at 12 noon and 5:00 p.m. and consisted of 14 and 16 subjects, respectively.

Five subjects dropped out after the first training session. An additional six did not attend any practice sessions. Despite their attrition from the program nine of the eleven completed the post evaluation measures. This resulted in the availability of pre-post assessment measures on 58 of the original 60 subjects.

Pre-Test Measures

Table 1 represents the means by conditions on the pre-test measures collected prior to the beginning of the relaxation training sessions. These include the motivation for control, expectation for control over health, anxiety, symptom measures and age. T-tests on these means revealed no significant differences between conditions on any of these variables. Additionally, the number of subjects who had previous experience in health or exercise programs was not significantly different between groups.

TABLE 1

MEANS BY CONDITION FOR PRE-TEST MEASURES

	Means by Condition		
	<u>Scale Range</u>	<u>PC</u>	<u>SP</u>
Desire for Control (higher score = greater desire for control)	20-140	104.50	100.83
Health Locus of Control (lower score = greater internal control)	11-66	29.70	30.79
State Trait Anxiety Inventory (higher score = less anxious)	20-80	57.40	56.45
Symptom Index	0-75	35.52	32.18
Age in Years	20-64	35.97	36.16

Adherence Measures

The dependent variable of major interest was program attendance. All subjects were included in this initial adherence analysis. A significant difference in the number of training sessions attended as a function of condition was obtained. Specifically, attendance at the three training sessions was significantly higher for the Perceived Control condition $t = 3.03$, $p < .0045$, when compared to the Standard Program condition. Additionally, combined attendance at the seven training and practice sessions supported the difference between the conditions, demonstrating a trend for better overall attendance by the Perceived Control groups, $t = 1.97$, $p < .07$. Figure 1 represents the percentage of attendance at practice and training sessions by group.

Looking at only the number of practice sessions attended there was no significant difference between conditions, ($p < .20$). Further, the number of Health Assessment forms returned to the experimenter was not significantly different between the conditions, ($p < .23$).

The number of Relaxation Practice records returned constituted a self-report of practice outside the session. No difference was noted between the conditions on this measure, ($p < .56$).

The secondary hypothesis predicted an interaction between the individual difference measure, Desire for Control, and treatment condition on the adherence variables. This effect was analyzed by testing for a difference between the regression coefficients for each condition (Goodnight, 1979). No significant interaction was demonstrated for combined training practice session attendance ($p < .74$). Likewise,

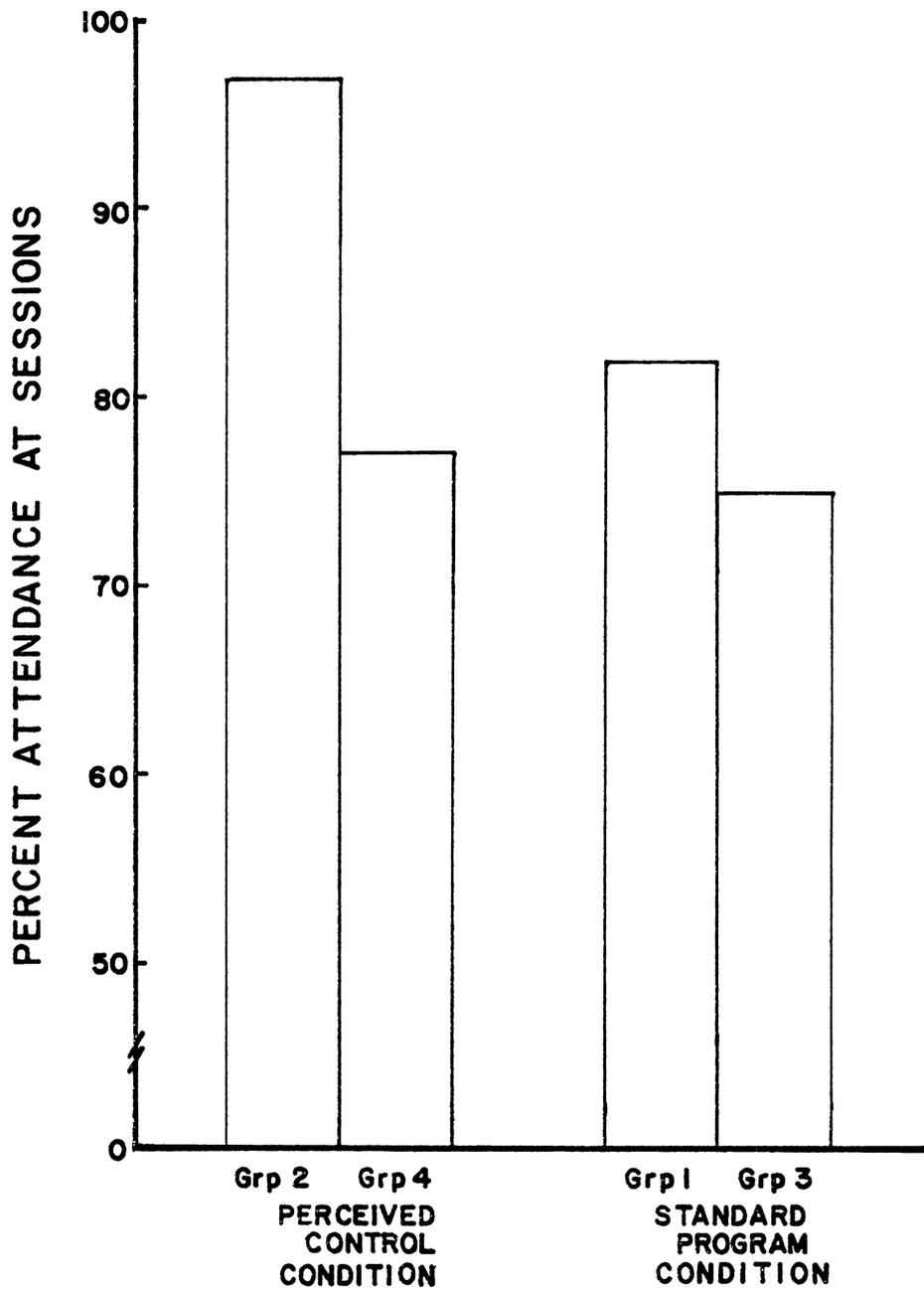


Figure 1. Percent attendance by group.

evaluation of the self-report measure of relaxation practice reflected no interaction of condition and Desire for Control score, ($p < .71$).

Non-Adherers

For the purpose of this study, non-adherers have been defined as those subjects attending less than four sessions. That is, they attended no practice sessions. There were a total of 11 subjects in this category, 8 in the SP and 3 in the PC condition. Evaluation of the difference in adherence rates between conditions suggests that these individuals had a dramatic impact upon adherence means. Figure 2 illustrates the point in time at which these subjects discontinued participation, represented by the number of training sessions attended by each of the non-adherers. The pre-test variables were evaluated for differences between this group and the program adherers. Specifically, means on the Health Locus of Control, State Trait Anxiety Inventory, Desire for Control scale, and age were evaluated by t-test. No significant differences between the program adherers and non-adherers were obtained, probability values all greater than .10. The difference between the program adherers and non-adherers on previous similar program experience was assessed by chi-square analysis. The difference was not significant.

As can be seen from Figure 2, five subjects dropped out after the first session, four of these in the Standard Program condition, one in the Perceived Control condition. These subjects represent the program drop-outs. The impact of their early withdrawal upon the attendance

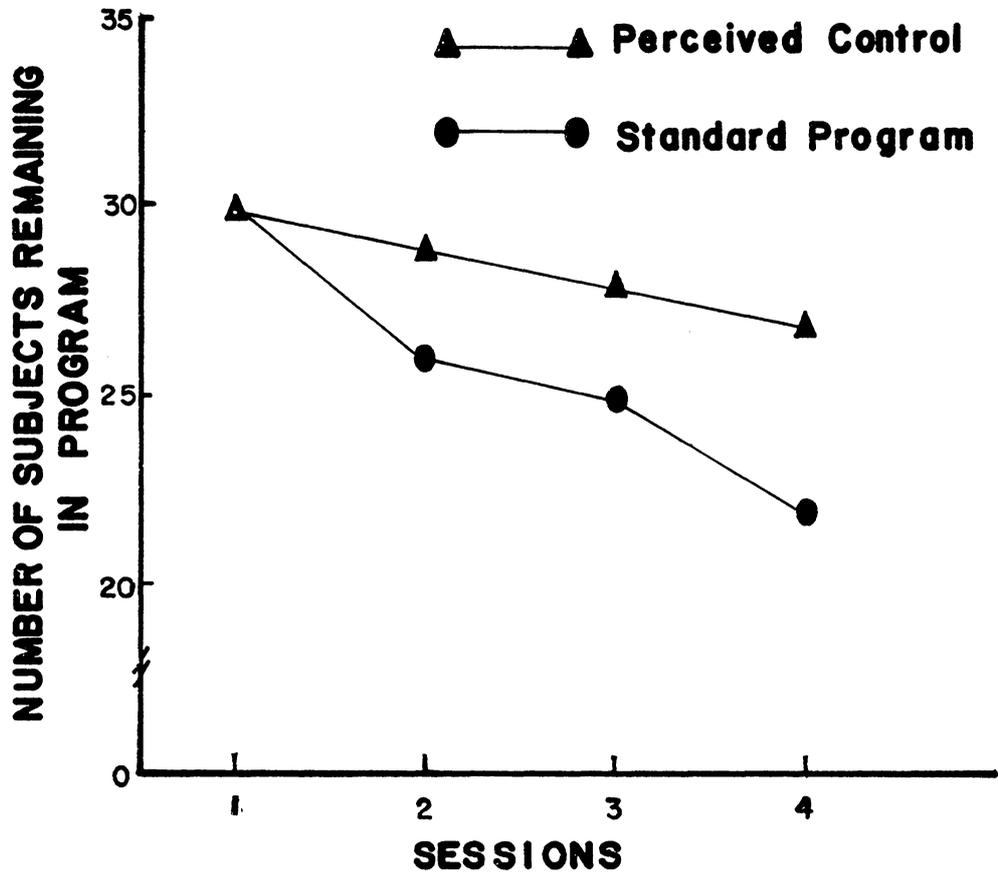


Figure 2. Number of subjects remaining in program at each session by condition.

measures is illustrated in Figure 3. This figure represents the percent attendance in each condition with the drop-outs excluded from the analysis. This comparison makes it apparent that the attendance rates of each condition are no longer significantly different. Chi square analysis on the difference in the number of drop-outs in the PC and SP conditions achieved a probability value greater than .10. This indicates that despite the impact of drop-outs on program attendance within each condition, there was no effect of condition on drop-outs per se.

Manipulation Check

While acknowledging the difficulty of validly assessing subjects' perception of control in the program, one question on the Post-Assessment Questionnaire (see Appendix I) was asked to directly assess the control felt in developing relaxation into a personally relevant skill. A ten point scale was employed to rate control, with 1 signifying No Control and 10 Complete Control. The PC mean was 6.50 and the SP mean was 6.84. This question failed to discriminate between the conditions. Another validity check of the choice manipulation involved assessment of subjects' perception of differences between the relaxation tapes. The perception of an opportunity for relevant choice was supported. Subjects rated the degree of important differences between the tapes at a mean of 5.5 on a scale of 10. Subjects also noted an average of 2.6 differences between the tapes. The means on each of these variables by condition is represented in Table 2.

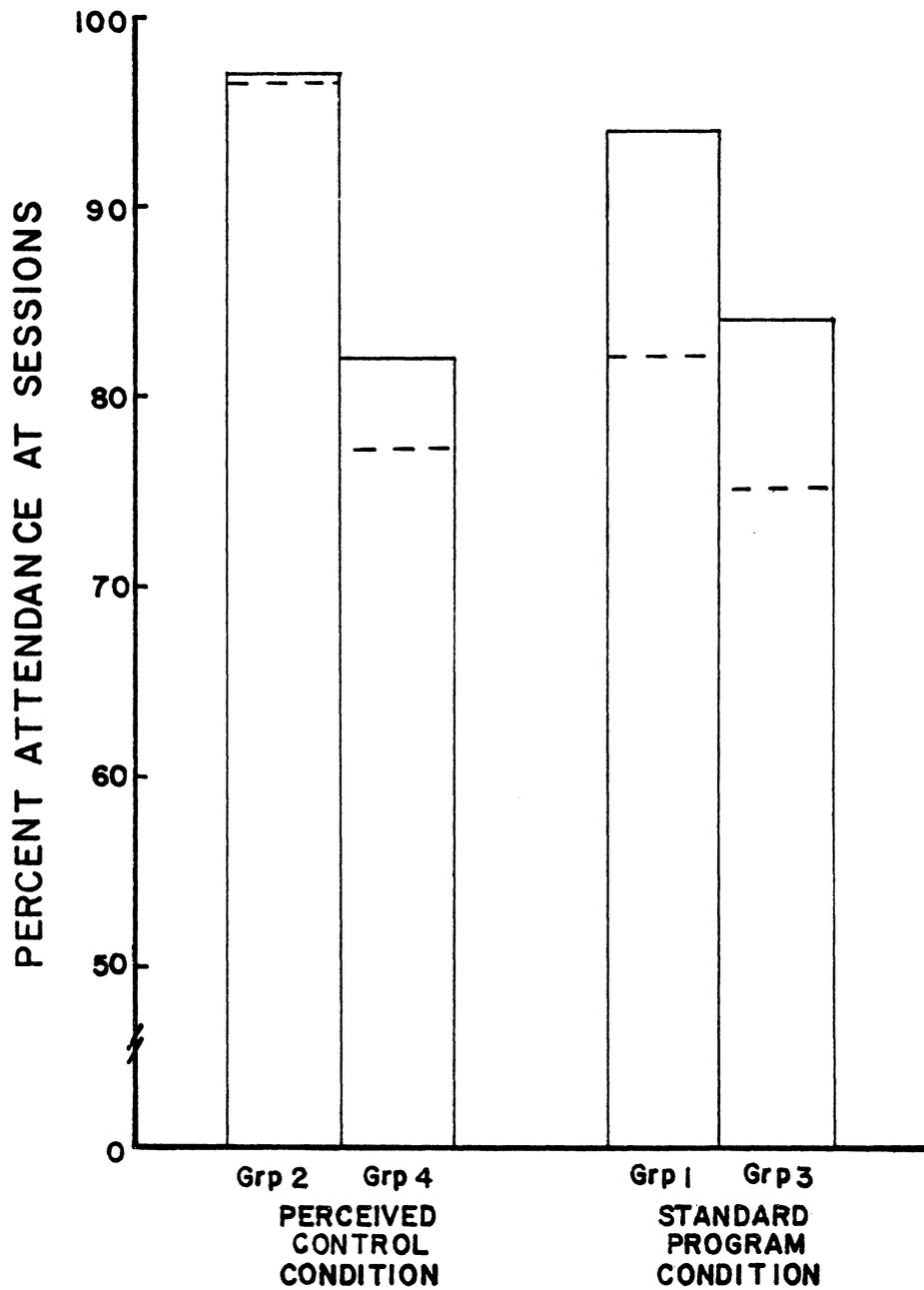


Figure 3. Percent attendance by group. Solid line designates attendance with drop-outs excluded. Dashed line indicates overall attendance of all subjects.

TABLE 2
MEANS OF POST ASSESSMENT MEASURES

	<u>Scale Range</u>	<u>Condition</u>	
		<u>Perceived Control</u>	<u>Standard Program</u>
Important of differences between tapes	1-10	5.54	5.45
Number of differences between tapes		2.56	2.72
Control in developing relaxation into skill.	1-10	6.50	6.84
Degree of importance of relaxation to health.	1-10	7.52	7.25
Program satisfaction.	1-10	6.88	7.0
Degree of expectations met	1-10	6.96	7.2

Health, Anxiety, Productivity Measures

The effect of the relaxation procedure on reduction of stress-related problems and physical symptoms identified by each subject as problematic at pre-test (Appendix H) was demonstrated by the overall reduction in the symptom index, a measure of frequency and severity of symptoms, $F = 9.97$, $p < .003$, as a function of time. No differential effect of condition on symptom reduction was obtained. This is consistent with expectation as both conditions received equally effective training procedures.

It is of interest that the symptom index was negatively related at post-test to the amount of support for practicing relaxation the participant reported receiving from their spouse or partner, $r = -.49$, $p < .02$. This suggests that the more support subjects received the greater the reduction in stress-related problems. The post-test symptom index was also significantly related to post-test anxiety measures on the STAI scores, $r = +.54$, $p < .0001$.

A measure of self-rated symptoms used to monitor general health problems (Appendix B) did not demonstrate any reliable changes over time or differences between conditions. Subjects rated severity of symptoms three times during the training and again at the post-test. There were no reliable changes over time or differences between conditions, probabilities are greater than .10. The measure of self-rated quality of productivity (Appendix B) also failed to reveal a significant effect of time or condition. The measure of quantity of productivity (Appendix

B) did reveal a marginally significant improvement from first rating to post rating, $t = 1.96$, $p < .055$.

Anxiety as measured by the STAI (trait version), revealed a significant reduction in anxiety in the sample as a whole, over time, $F = 15.30$, $p < .0001$. There was no differential effect of condition or an interaction of treatment and time.

The foregoing results suggest that the relaxation program was effective in a number of ways. Most importantly, it appears to have had a significant impact on the sample as a whole in reducing subjects' target stress-related symptoms and general anxiety. While these may be true effects, the lack of a relaxation control group precludes a definitive statement of the efficacy of the relaxation program.

No relationship was obtained between scores on the Health Locus of Control scale and any adherence measure. The pre-post assessment of this scale revealed a non-significant increase in internal control over health. The relationship obtained between Health Locus of Control scores and other measures was limited to post scores on HLOC and symptom index, $r = +.28$, $p < .04$.

Evaluation of the average amount of tension reduction obtained from practice of relaxation exercise revealed a positive relationship between reported frequency of practice and amount of tension reduction, $r = +.37$, $p < .0075$. There was no differential effect of condition on tension reduction ($p < .75$).

Post-Assessment

The post-assessment measures were evaluated for differences between conditions on these ratings of the program and its impact. All questions were rated on a scale of 1-10. Table 2 illustrate the means on the relevant measures. As is evident from the means, there were no significant differences between conditions on these items, probabilities all greater than .10.

A number of significant relationships were obtained between these measures and the adherence variables. The total attendance measure was positively related to the degree to which the subject's expectations were met at $r = +.28$ ($p < .04$), while the relationship to satisfaction with the program is $+.36$, ($p < .008$). The measure of attendance at training sessions was related to the control participants felt in developing relaxation into a skill suited to them personally, $r = +.32$, $p < .02$. Attendance at training sessions was related to rated importance of relaxation, $r = +.36$ ($p < .01$).

Similar relationships have been obtained in previous studies between adherence and subjects' report of satisfaction, value of treatment, etc. While these results suggest the importance of such subjective evaluation, post-test measures are clearly influenced by the previous behavior of the individual. Consequently, the predictive utility of these results is compromised by the time at which they were obtained.

DISCUSSION

Adherence

The fundamental finding in this investigation is that a program format designed to enhance subjects' perception of control resulted in better overall group attendance at program sessions than did a standard program format. The perceived control manipulation, which included an explanation of forthcoming choices and a program rationale of increased control over health, was delivered in the orientation session. It appeared to have its main effect on adherence by preventing program drop-outs. This finding is supported by previous research which suggests program and setting variables have the greatest impact on continuation in treatment (Fiester & Rudestam, 1975). Additionally, it is consistent with laboratory results indicating that the performance of subjects is enhanced when they are provided with an early opportunity for choice (Monty, Rosenberger & Perlmutter, 1973).

The perceived control treatment consisted of two straight-forward manipulations. The first was to provide subjects with the opportunity for choices within the program. This was relatively simple to administer and is adaptable to a variety of programs and treatments. Subjects were informed that they would have two opportunities to choose their preferred relaxation tape. The two taped relaxation exercises were clinically valid muscle tension-relaxation techniques that were recorded by the same person. They are functionally equivalent treatments with the result that either choice made by a subject resulted in the same

relaxation treatment. However, subjects in both conditions reported noticing some important differences between the tapes. The Perceived Control subjects enumerated a mean of 2.55 differences while the subjects in the Standard Program condition noted a mean of 2.72 differences between tapes. Subjects in both conditions rated the degree of important differences between the tapes at a mean of 5.5 on a ten point scale. When, as in this instance, the alternative outcomes of choice are similar, choice is a function of the differences perceived between options. Thus, despite the clinical equivalence of the tapes enough differences were recognized to make choosing between them a valid manipulation (Harvey & Johnston, 1973).

The second aspect of the perceived control manipulation was the program rationale presented. The value of relaxation in increasing a person's control over short and long-term health was accentuated in the orientation. While this was not presumed to be a potent treatment in itself it was employed to provide the framework for the self-care or participative model of program presentation. This model underscores the importance of subjects' choice in the perceived control condition.

As an additional check on the manipulation, subjects were asked in the post-evaluation to rate a number of issues on a ten-point scale. These measures included the degree of control they perceived and the importance of relaxation practice to health. The fact that there were no significant differences between the conditions on these measures may indicate that the choice and program rationale manipulations were ineffective in developing a perception of control. However, another

possible explanation is that such direct inquiry is an inadequate method for distinguishing gradations of perceived control.

As Nisbett and Wilson (1977) have discussed, the sources of our motivation and causes of behavior are not available for our inspection. Attributions regarding behavior tend to be developed on a post-hoc basis. It is necessary to pose the question of control to research subjects to demonstrate their experience of a normative level of control and to ascertain that no threat to control was experienced. However, obtaining a reliable estimate of the relative degree of perceived control is very unlikely.

The Interaction Hypothesis

A primary hypothesis of this study predicted an interaction between individual differences in motivation for control and treatment condition. Specifically, it was predicted that subjects high in motivation for control would adhere better (attend more training and practice sessions and practice more frequently at home) if they received a program that enhanced their perception of control. Conversely, subjects low in motivation for control were predicted to adhere best to a program format that was clinician directed. The lack of support for this interaction may be explained from several perspectives. Most fundamentally there was no relationship, assessed as a Pearson Product-Moment Correlation, between score on the Desire for Control scale and any adherence measure. This minimizes the likelihood of obtaining an interaction between Desire for Control and treatment on

adherence. The lack of a relationship between control motivation and adherence may be a function of the measurement approach, and more broadly, of the idiosyncratic organization of behavior within individuals. Azjin and Fishbein (1977), among others, have demonstrated that the measurement of general attitudes and beliefs have a limited ability to predict specific behaviors. The intent of the Desire for Control scale is to assess general motivation for control. This is perhaps too broad a focus to permit accurate prediction of adherence to a health promotion program. Lefcourt (1979) has maintained that development of specific, focused measures such as the Health Locus of Control (Wallston, et al, 1976) will improve the predictions we are able to make from individual difference measures. However, the lack of a relationship between adherence measures and scores on the Health Locus of Control scale which was developed to predict participation in health behaviors suggests the need for a more fundamental explanation.

Mischel (1973) has best articulated the difficulties inherent in the search for consistent individual differences in behavior. He maintains that behavior is idiosyncratically organized within individuals. The same pattern of stimulus events may be interpreted and/or responded to differently by various individuals as a function of moderator variables such as intelligence and prior experience. While theoretically one might be able to specify the major moderator variables and predict their effect, this has not been an empirically fruitful approach. Wallach (1972) maintains that the empirical basis for consistency in

behavior based on understanding moderator variables is more apparent than real.

The present research lends support to this conclusion as most of the potential moderator variables, sex, marital status, occupation (education) were not associated with adherence. The one exception to this was age. Older subjects were somewhat more likely to attend practice sessions and practice relaxation at home. The relationships are in the range of $+.25-.29$, $p < .05$. Not only does this account for a minimal amount of variance, there is no practical utility of age as a moderator variable. One can hardly expect to manipulate the age of participants.

Health Outcomes

The effect of the program in reducing stress-related symptoms and trait anxiety must be interpreted cautiously due to the absence of an appropriate control group. However, the findings are consistent with other research on the efficacy of relaxation exercise (Carrington, et al, 1980; Peters, Benson & Peters, 1966). As all subjects were provided with the ample opportunity to learn the technique, no differential effect of treatment conditions was expected, nor was one obtained. The relationship of symptoms to scores on the State Trait Anxiety Inventory is also an expected finding that has been previously reported (Frederiksen, Winett & Riley, 1981). The general, but statistically non-significant increase obtained in subjects' internal control over

health is consistent with theory and research in the area (Wallston, et al, 1976).

A final measure of physical well-being is the tension reduction reported by subjects after practicing relaxation. Not surprisingly, subjects who practiced more frequently had a greater average reported reduction in their tension levels. The correlational nature of this result precludes assignment of causality. Subjects who practiced frequently and obtained good tension reduction were also likely to report having their expectations satisfied by the program. Several theoretical explanations of these findings, other than treatment efficacy, may be postulated. In particular, the cognitive dissonance (Festinger, 1954) and causal attribution (Bem, 1967) theories provide explanations for the reasons individuals positively evaluate activities they have recently participated in.

In sum, the muscle-tension relaxation exercise was supported as an effective strategy for reducing self-reported anxiety and self-report physical symptoms in this sample of university employees.

Post-evaluation

Adherence variables were significantly related to a number of evaluative responses at post-test. Other findings in the adherence literature (Becker, et al, 1979; Eisenthal, et al, 1979; Ley, 1977) support the relationships obtained in this study between adherence, subject satisfaction with the program and report of expectations being met. Additionally, these variables and the importance accorded relax-

ation practice to health were highly related to the control subjects perceived regarding the program format. The assessment of degree of control experienced in the situation was significantly related to adherence, while no such relationship was found for the attitude measurement of desire for control. A number of cautions are necessary in interpreting these responses. Post-test reports of satisfaction, fulfilled expectations, etc. are likely to be influenced by previous behavior, specifically adherence behavior. Additionally, the relationships between reported satisfaction, expectations and perceived situational control are subject to threats of method bias as they were all assessed in the same manner and at the same time.

These limitations notwithstanding, the results are consistent with previous findings in the literature. Satisfaction is complexly related to adherence in previous research. In a study conducted at a psychiatry walk-in clinic Eisenthal, et al. (1979) determined that satisfaction was significantly correlated with the perception that the clinician understood the patient's request and was helpful. These variables were directly related to adherence, while the measure of satisfaction per se was not significantly correlated with adherence. Ley (1977) in a review of the compliance literature found that different aspects of the clinician-patient interaction affected satisfaction and adherence in different ways. In general, the self-report of patient satisfaction was significantly higher than the compliance as measured either by thorough, non-threatening interviews or return visits.

In contrast, studies that have evaluated patient expectations (Eisenthal, et al, 1979; Ley, 1977) have found that fulfilled expectations were more directly and consistently related to compliance. The present research resulted in satisfaction and expectations being very similarly related to variables of adherence as well as to tension reduction and the degree of control the subject perceived. Additional research is necessary to distinguish what differential relationships satisfaction and expectations have to program adherence.

Conclusion

This investigation supports the majority of research in the area of adherence. Individual differences such as the motivation for control do not have a significant impact on compliance. Setting differences, on the other hand, do have a demonstrable effect. In the present research the provision of perception of control resulted in a reduced number of program drop-outs. This attrition had a significant impact on program attendance. While it can not be assumed that drop-outs are treatment failures, the thoroughly demonstrated effectiveness of relaxation in reducing symptoms and anxiety suggests the importance of keeping participants in the program until they have mastered the skill. This study has not provided a definitive explanation for the fewer number of drop-outs in the perceived control condition. However, it does suggest that providing participants with the opportunity for choice may increase commitment to a program. Because of the ceiling effect obtained on the

subjects who did not drop-out, the impact of perceived control on adherence remains untested.

The generalizability of these findings are limited by both the sample characteristics and the work-site setting. Evidence for the atypical support given the program may be seen in the perfect attendance record of the faculty at training sessions. Anecdotally, many subjects reported their commitment to support the research by fully participating. Clearly, this is not the usual response one receives in the delivery of health promotion programs. The volunteer status of these subjects is a potential source of bias limiting the external validity of the results (Gordon, 1976). Participants who were referred on the basis of some assessment of need could be expected to respond in a different, but unpredictable manner. Additionally, the factor of convenience is well-known to affect compliance. Generalizations of results must therefore be limited to other similarly convenient delivery settings. An adequate test of the perception of control manipulation will require a less enthusiastic and supportive sample and/or a more extended program format.

In sum, the results of this study and the majority of others in the literature suggest that further research and application will be most effective in improving adherence through manipulation of setting characteristics. Specifically, increasing the control and participation of the subject/client appears to have potential as a practical, effective means of increasing program adherence.

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APPENDICES

APPENDIX A

APPENDIX B

APPENDIX C

DESIRE FOR CONTROL SCALE

Below you will find a series of statements. Please read each one carefully and respond to it by expressing the extent to which you believe the statement applies to you.

For all items a response from 1 to 7 is required. Place the number in the space to the left of each statement that best reflects your belief when the scale is defined as follows:

1	2	3	4	5	6	7
Does not apply to me at all	Does not usually apply to me	Most often does not apply to me	Applies about 1/2 the time, <u>OR</u> I am un- sure whether it applies to me.	Applies more often than not	Usually applies to me	Always applies to me

- _____ 1. I prefer a job where I have a lot of control over what I do and when I do it.
- _____ 2. I enjoy political participation because I want to have as much of a say in running government as possible.
- _____ 3. I try to avoid situations where someone else tells me what to do.
- _____ 4. I would prefer to be a leader than a follower.
- _____ 5. I enjoy being able to influence the actions of others.
- _____ 6. I am careful to check everything on an automobile before I leave for a long trip.
- _____ 7. Others usually know what is best for me.
- _____ 8. I enjoy making my own decisions.
- _____ 9. I enjoy having control over my own destiny.
- _____ 10. I would rather someone else took over the leadership role when I'm involved in a group project.

1	2	3	4	5	6	7
Does not apply to me at all	Does not usually apply to me	Most often does not apply to me	Applies about 1/2 the time, <u>OR</u> I am un- sure whether it applies to me.	Applies more often than not	Usually applies to me	Always applies to me

- _____ 11. I consider myself to be generally more capable of handling situations than others are.
- _____ 12. I'd rather run my own business and make my own mistakes than listen to someone else's orders.
- _____ 13. I like to get a good idea of what a job is all about before I begin.
- _____ 14. When I see a problem I prefer to do something about it than sit by and let it continue.
- _____ 15. When it comes to orders, I would rather give them than receive them.
- _____ 16. I wish I could push many of life's daily decisions off on someone else.
- _____ 17. When driving, I try to avoid putting myself in a situation where I could be hurt by someone else's mistake.
- _____ 18. I prefer to avoid situations where someone else has to tell me what it is I should be doing.
- _____ 19. There are many situations in which I would prefer only one choice rather than having to make a decision.
- _____ 20. I like to wait and see if someone else is going to solve a problem so that I don't have to be bothered by it.

APPENDIX D

APPLICATION

RELAXATION EXERCISE PROGRAM
Offered through the Psychological Services Center
VPI&SU

Return this application via the campus mail to:
Psychological Services Center
Attn: Anne Riley (961-6914)

Thank you for your interest in the Relaxation Exercise Program. It is being offered on Campus, in Williams 123, to facilitate attendance by Staff and Faculty within the normal working day. Sessions are scheduled for 12 noon and 5 p.m. Sessions may also be scheduled at 7:15 a.m. if there is adequate demand.

If you enroll in the program, you will attend one 45 minute Orientation session. This will be held August 6-10. You will also attend three (3) 40 minute Training sessions that will be held between August 11-18.

You will be contacted, by phone, August 4,5, or 6 with your meeting schedule.

30 minute Practice sessions will be held daily at 12 noon and 5 p.m. from August 19-27. We recommend that each person attend four (4) Practice sessions as they are important to the mastery of the technique.

In summary, the program consists of 1 Orientation sessions and 3 Training sessions. Attendance at 4 Practice sessions is recommended.

Please assist us in developing the schedule by returning this application as promptly as possible.

Print Name	Age	Home Phone	Marital Status	Sex
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Department	Phone	Position	Office Location
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Indicate your preferred meeting time and any scheduling restrictions:

I am able to attend at either 12 noon or 5 p.m. _____.

I am able to attend at 12 noon only _____.

I am able to attend at 5 p.m. only _____.

Preferred alternate meeting times (please specify) _____.

Any scheduling restrictions (please specify) _____.

APPENDIX E

STATE TRAIT ANXIETY INVENTORY TRAIT VERSION

A number of statements which people have used to describe themselves are given below. Read each statement and then indicate HOW YOU GENERALLY FEEL. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

This is the scale for all these questions:

1	2	3	4
"Almost Never"	"Sometimes"	"Often"	"Almost Always"

1. I feel pleasant.
2. I tire quickly.
3. I feel like crying.
4. I wish I could be as happy as others seem to be.
5. I am losing out on things because I can't make up my mind soon enough.
6. I feel rested.
7. I am "calm, cool, and collected".
8. I feel that difficulties are piling up so that I cannot overcome them.
9. I worry too much over something that really doesn't matter.
10. I am happy.
11. I am inclined to take things hard.
12. I lack self-confidence.
13. I feel secure.
14. I try to avoid facing a crisis or difficulty.
15. I feel blue.
16. I am content.
17. Some unimportant thought runs through my mind and bothers me.

APPENDIX F

HEALTH LOCUS OF CONTROL

This questionnaire has to do with beliefs that people have about their health. It consists of a series of statements followed by the 6 point rating scale below. indicate the numbers from this 6-point scale that most closely agrees with your own beliefs. The higher the number the more you agree with it. Please answer each item and do not spend too much time thinking about any one. Again, there are no right or wrong answers.

1	2	3	4	5	6
Strongly disagree					Strongly agree

21. If I take care of myself, I can avoid illness.
22. Whenever I get sick it is because of something I've done or not done.
23. Good health is largely a matter of good fortune.
24. No matter what I do, if I am going to get sick I will get sick.
25. Most people do not realize the extent to which their illnesses are controlled by accidental happenings.
26. I can only do what my doctor tells me to do.
27. There are so many strange diseases around that you can never know how or when you might pick one up.
28. When I feel ill, I know it is because I have not been getting the proper exercise or eating right.
29. People who never get sick are just plain lucky.
30. People's ill health results from their own carelessness.
31. I am directly responsible for my health.

APPENDIX G

APPENDIX H

APPENDIX I

POST ASSESSMENT QUESTIONNAIRE

Please answer the questions on this and the next page directly on these pages. I will most appreciate your honest responses to the questions regarding the program (as well as to the others, of course).

1. Think about your original expectations for the Relaxation program. Using the rating scale below, rate the extent to which your expectations were met.

1	2	3	4	5	6	7	8	9	10
No expectations met									All Expectations met

2. Rate on the scale below, the degree to which you are satisfied with the results you have personally obtained from the Relaxation Program.

1	2	3	4	5	6	7	8	9	10
Not at all satisfied									Completely satisfied

3. Rate the overall program quality on the scale below.

1	2	3	4	5	6	7	8	9	10
Very Poor									Excellent

4. Rate on the scale below, the degree to which you were able to obtain a schedule for the Training and Practice sessions that was suitable for you.

1	2	3	4	5	6	7	8	9	10
Impossible									Completely

5. Think back to the beginning of the program. Rate on the scale below the amount of input or control you had in developing the Relaxation exercise into a skill suited to your specific needs and lifestyle.

1	2	3	4	5	6	7	8	9	10
None at all									Completely

6. Given the demands of your schedule, transportation, etc., rate the degree of difficulty you encountered in attending the Training and Practice sessions.

1	2	3	4	5	6	7	8	9	10
Very difficult									Very easy

APPENDIX J

CONSENT FORM

I hereby consent to participate in the research aspect of the Relaxation Exercise program being conducted through the auspices of the Psychological Services Center. I understand that this involves filling out a form at the Orientation and another at the completion of the program. Additionally, there is a daily Relaxation Practice Record to be completed each time I practice the Relaxation Exercise, and a brief health assessment form to be completed three times. Finally, I agree to participate in a 15 minute taped interview at the end of the program. I understand that Relaxation Exercise is a proven technique, whose usefulness is not under investigation, that no harmful effects are likely to occur as a result of its practice, and that VPI & SU incurs no liability regarding this program.

I understand that participants will be assigned to groups randomly, and that groups will differ only in minor aspects of the presentation of the program. Information will remain confidential and will be used only for research purposes.

I may withdraw without negative consequence at any time by simply informing the program coordinator, Anne Riley, of my intent to do so. Inquiries regarding the program may be made to Lee W. Frederiksen, Ph.D., Director, Psychological Services Center, or to the Institutional Review Board at VPI & SU.

Signed

Date

Witness: _____

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ADHERENCE TO A WORK-SITE
RELAXATION PROGRAM

by

Anne Werber Riley

(ABSTRACT)

This study investigated the effects of enhanced perception of control on adherence to a worksite relaxation program. The design was a 2 x 2 between subjects manipulation in which desire for control was an individual difference measure and condition was an experimenter assigned treatment. Subjects were randomly assigned to either Perceived Control (PC) condition or a Standard Program (SP) format. The perception of control manipulation was operationalized as the opportunity for important choices in the program.

It was hypothesized that subjects in the perceived control condition would adhere significantly better than those in the standard program condition. An interaction between motivation for control and condition was predicted such that subjects high in desire for control would adhere best in the PC condition, and the converse would hold for those low in motivation for control.

Sixty university staff and faculty who volunteered for a relaxation training program were offered an orientation and three training ses-

sions, and were given the opportunity of attending four practice sessions.

Dependent measures of adherence included attendance and self-monitoring of home relaxation practice. Dependent variables of secondary interest included pre-post measures of anxiety, physical symptoms and perception of control over health.

Analysis of the adherence measures demonstrated a significant effect of condition on attendance at training sessions only, $p < .0045$, accounted for by the great number of drop-outs in the SP condition. There were no significant differences between conditions on other adherence measures. There was no statistically significant effect of condition on dropping out, per se. A ceiling effect on attendance by those subjects who continued in the program obscured any other differences. There was no evidence of an interaction between condition and desire for control on adherence.