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Self-disclosure in biofeedback of hypertension

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SELF-DISCLOSURE IN BIOFEEDBACK OF HYPERTENSION

by

Susan Christine Hendershot

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Abstract

SELF-DISCLOSURE IN BIOFEEDBACK OF HYPERTENSION

By Susan Christine Hendershot

Chairperson of Supervisory Committee:

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School of Nursing

The purpose of this study was to examine subject self-disclosure as a variable which heightens the value of biofeedback, impacts psychophysiologic arousal, and influences the therapeutic relationship between nurse and client.

This investigation was a repeated measures design of a drug free hypertension sample. Subjects who demonstrated hypertension entered the treatment phase of the investigation. Subjects were assessed prior to the intervention using multiple measures of cognitive/affective function, as well as psychophysiologic and hemodynamic responses.

Subjects (N=20) received 14 training sessions. Biofeedback sessions were approximately one and one-half hours in duration occurring twice a week for the first month and weekly thereafter. The biofeedback component of the intervention was designed to increase the subject's ability to regulate his/her cardiovascular responses through multi-modal training in heart rate control, alteration of respiratory patterns, and generalized decrease in sympathetic arousal through relaxation training. The self-management/stress counselling component of the intervention utilized a psycho-educational format individualized to the subject and the specific concerns brought to the

therapeutic arena.

Self-disclosure was measured using a twenty item tool of assessing "sharing" behavior (adapted from The Patient Self-Disclosure Questionnaire; Dawson, 1985). Modified versions of the tool assessed the clinician's perception of subject's self-disclosure, and subject perception of difficulty of self-disclosure during a particular training session. Convergent validity of the self-disclosure tool was tested with the use of an analog scale.

The results of the analysis of the correlation of change in self-disclosure visual analog scale and change scores on the global and subscale dimensions of the SCL-90-R (Derogatis, 1979) and subscales of the Symptoms of Stress Inventory (Leckie and Thompson, 1978) demonstrated a significant relationship between increase in self-disclosure and increase in multiple indicators of psychological distress including positive symptom total, hostility, and cognitive disorganization.

In addition, this investigation examined the association between change in self-disclosure and change in several indicators of hypertension. Data analysis demonstrated an association between decrease in diastolic blood pressure and systemic vascular resistance and increase in self-disclosure.

These study results suggest that the intrapersonal changes associated with self-disclosure in a biofeedback-assisted self-management training are significant. In summary, self-disclosure by clients during biofeedback training increased and was paradoxically associated with decrease in indicators of hypertension and increase in dimensions of psychological distress.

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ACKNOWLEDGMENTS

Research is by nature a collaborative process and this investigation was no exception. The people who contributed substantively to this dissertation are too numerous to be adequately acknowledged here. However, I wish express my profound gratitude to a few of those who gave so much.

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Dr. Lee Eggert inspired and contributed substantially to this dissertation during each stage of the four year process from conception through to the completed manuscript. Specifically, Lee contributed to the development of the model, the speech communication perspective contained within the conceptual framework, and in addition painstakingly provided me with detailed suggestions for revisions as an invaluable member of my reading committee.

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CHAPTER ONE

SELF-DISCLOSURE IN BIOFEEDBACK OF HYPERTENSION

INTRODUCTION

The purpose of this study was to examine self-disclosure as a variable in biofeedback-assisted self-management training. Self-disclosure is defined as the voluntary verbalization of information about oneself to another individual (Cozby, 1973). In the literature addressing the helping relationship, early moderate self-disclosure has been correlated with positive therapeutic outcome (Jourard, 1971; Cozby, 1973; Janis, 1982; Abramowitz, Berger & Weary, 1982; Parr, Bryant & Brickman; 1982). Self-disclosure by patients early in the process of receiving health care enables the provider to develop appreciation for the patient's problem in context. In addition, it allows the therapist to map patterns of antecedents and consequences surrounding the problem brought to the therapeutic arena. In this way, self-disclosure acts as a significant variable operating in the development of the helping relationship (Janis, 1982; Brammer, 1988). Thus, self-disclosure by patients may be a key to understanding the helping relationship entailed in biofeedback-assisted self-management training.

Self-disclosure is defined as the voluntary verbalization of information about oneself to another

individual (Cozby, 1973). The concept of self-disclosure is rooted in existential and phenomenological philosophy traditions. Self-disclosure is a social phenomenon. Self-disclosure implies that there is a self (the disclosing individual), and a target (an individual present to receive the disclosure). In addition, the disclosure (a topic) occurs within both a social context (a relationship), and an environmental setting (a situation) (Chelune, 1979, p.16).

The construct of self-disclosure contains five basic person-related parameters (Chelune, 1979). 1) The amount or breadth of personal information disclosed, 2) the level of intimacy of the information disclosed, 3) the duration or rate of disclosure, 4) the affect of the disclosing individual, and 5) the level of self-disclosure flexibility as an attribute of the disclosing person (Chelune, p.7). Self-disclosure flexibility refers to the ability of the individual to modulate disclosure levels according to the interpersonal demands of the situation.

The dimension of flexibility has implications for mental health. The individual who is able to successfully modulate self-disclosure across a range of social situations in response to situational and interpersonal variables will probably function more effectively than the less flexible individual who has not learned to discriminate social-situational cues with regard to appropriate behavior in a particular situation. (Chelune, 1977, p.1140). Flexibility is

probably a component of a more general pattern of awareness and adaptability that is related to effective interpersonal functioning (Chelune, 1977, p.1143).

The use of a multidimensional model for the construct of self-disclosure clarifies the contradictory and inconsistent results of some early investigations.

Several investigators have found that females disclose more than males (Dimond & Munz, 1967; Pederson & Breglio, 1968; Jourard, 1971; Certner, 1973). However, a closer examination of this phenomena reveals that while women typically reveal more intimate information than men; they do not differ significantly from males in the self-disclosure parameters of amount, rate, affective manner of presentation, or flexibility of self-disclosure (Chelune, 1979).

Current literature in biofeedback focuses on the use of instrumentation, and the outcome of training (Ciarcia & Hoyle, 1981: Glasgow, Gaarder & Engel, 1982; Patel, Marmot & Terry, 1981; Engel, Glasgow & Gaarder, 1983; Jacob, 1984; Nakagawa-Kogan, et al., 1988). Little attention has been aimed at the process whereby these effects are achieved; e.g. the role of the therapeutic relationship. This lack of understanding of, and appreciation for, the role of the therapeutic relationship fosters a lack of precision and predictability in biofeedback. Specifying the role of the therapeutic relationship, particularly the dimension of self-disclosure, and identifying strategies to facilitate the

therapeutic process, presumably, will increase the efficacy of biofeedback training.

Self-management training in combination with biofeedback necessitates a therapeutic relationship between therapist and patient. This modality has many of the attributes of cognitive/behavioral psychotherapy (Kanfer, 1975; Karoly & Kanfer, 1982). However, unlike psychotherapy, biofeedback self-management training has a physiological locus. The orientation toward physiological functioning combined with the cognitive/behavioral treatment found in biofeedback-assisted self-management training make it a "powerful nursing therapeutic" (Nakagawa-Kogan & Betrus, 1984 p.124).

Increasingly, hypertension is identified as a disease characterized by psychological repression (Jamner, Shapiro, Goldstein, Hug, 1991; Warrenburg, Levine, Schwartz, et al; 1989). Repression, for the purposes of this investigation, is defined as a discrepancy between cognitive perceptions and psychophysiological responses (Weinberger, 1986). Individuals who are "repressive" believe that they are not distressed despite evidence which contradicts that belief. This self-deception implies that repressors are 1) motivated to maintain self-perceptions that they have a low rate of negative emotional reactions despite 2) a tendency to respond physiologically and behaviorally in a manner indicative of high levels of perceived threat (Weinberger, 1986; Jamner,

Shapiro, Goldstein and Hug, 1991; Schwartz, 1990).

A series of recent investigations suggest that self-disclosure is associated with a decrease in certain indices of psychophysiologic arousal (Pennebaker and Susman, 1988; Pennebaker and Beall, 1986) and enhanced immunocompetence (Pennebaker, Kiecolt-Glaser, and Glaser, 1988). These investigations lend support to a theory of inhibition and its linkage with disease. The theory of inhibition is based on a three-arousal model of psychophysiologic responses (Fowles, 1980; Gray, 1976). Self-disclosure, from the perspective of the patient, is an intrapsychic and physiological as well as an interpersonal process. An individual seeks to comprehend him/herself and responses in the context of their environment. The theory of inhibition postulates that to inhibit ongoing behavior, thoughts, and feelings requires "physiological work" (Pennebaker and Susman, 1988, p. 327). Over time, the work of inhibition acts as a cumulative stressor, and is associated with increases in stress-related diseases (Selye, 1976; Pennebaker and Susman, 1988).

PROPOSED MODEL OF SELF-DISCLOSURE IN BIOFEEDBACK

Biofeedback is the use of electronic instrumentation which assesses physiological parameters such as finger temperature, surface muscle tension, heart rate and blood pressure, this information is then "fed back" to the client. The client develops a heightened awareness of bodily function.

The primary goal of biofeedback is to develop increased awareness of both physiological and psychological states. The result is an increased ability to regulate physiological responses, particularly states of disregulation (Schwartz, 1983; Schwartz & Shapiro, 1979). See Figure 1.

In his regulation versus disregulation model Schwartz proposes that, in a well-functioning person, connection leading to self-regulation occurs with relative ease. In the impaired condition, there is a lack of attention to psychophysiological response cues. In disconnection, self-regulation is impeded and the system no longer makes automatic adjustments. The progression over time occurs as follows: disattention to disconnection to disregulation to disorder to disease (Schwartz, 1977; Schwartz, 1990).

Biofeedback is the feeding back of physiological signals in a meaningful manner. Through this disclosure process, the client develops an awareness of self. This heightened awareness can reconnect a disregulated individual to psychophysiological response patterns. The nurse witnesses this process in the client, and enhances the developing therapeutic relationship by facilitating the client's self-awareness and subsequent self-regulation.

In the literature pertaining to characteristics of a helping relationship, high self-disclosure has been correlated with positive therapeutic outcomes e.g. compliance to behavior change programs (Abramowitz, Berger & Weary, 1982;

Fehrenbach & O'Leary, 1982; Parr, Bryant & Brickman; 1982). Self-disclosure has been found to precede the development of commitment to the therapeutic relationship (Janis, 1982; Brammer, 1988; Parr, Bryant & Brickman, 1982).

The conceptualization of the helping relationship in biofeedback proposed here is that biofeedback produces high physiological disclosure. Interpretation of physiological signals and comparison with existing normative data occurs. Contextual meanings are also explored leading to a pairing of physiological signals with psychological events. This method of monitoring and feeding back of psychophysiological data facilitates the ensuing therapeutic relationship by promoting self-disclosure. However, variation in self-disclosure can be expected to occur despite the structure of biofeedback-assisted self-management training. These variations in patterns of self-disclosure are due to differences in flexibility, sex-related variability, psychological repression, and level of self-awareness.

In summary, the therapeutic relationship in biofeedback develops through the disclosure of the patient's physiological responses to the therapist and to the patient at the same time. Assessment and interpretations are made by comparing of the patient's physiological signals with normative data. Contextual meanings are also explored, pairing physiological signals with psychological events. In this way, the monitoring and feedback of psychophysiological

data can facilitate the ensuing therapist-client relationship and promote altered psychophysiological response patterns.

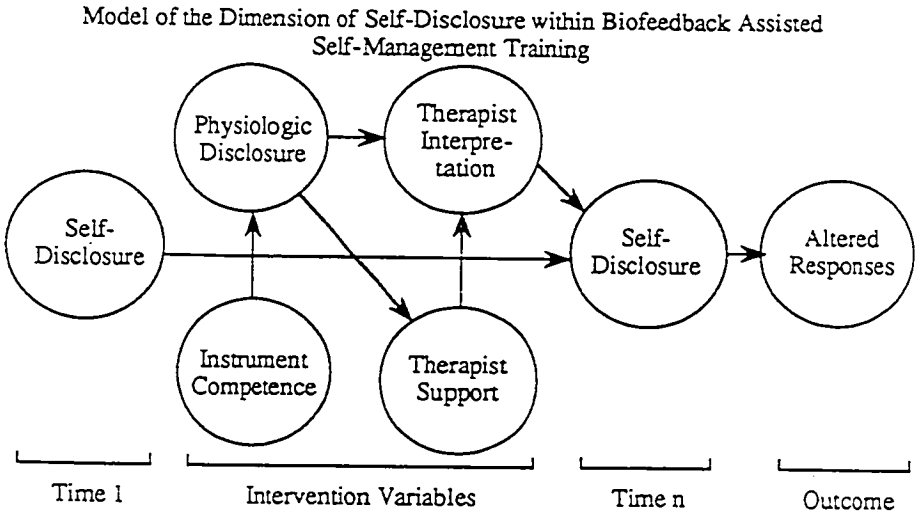


FIGURE 1: MODEL OF SELF-DISCLOSURE IN BIOFEEDBACK

SPECIFIC AIMS

The specific aims of the study were: 1) to determine the effect of biofeedback/self-management training for the treatment of essential hypertension on patients' self-disclosing behavior and perceived difficulty of self-disclosure, 2) to examine the level of congruence between patients' self-report and the perception of the clinician of the patient's self-disclosing behavior, 3) to examine patterns in the changes in content and/or amount of self-reported self-disclosing behavior by patients pretraining to posttraining, as well as perception of the difficulty of self-disclosure, 4) to describe and contrast patterns between men and women of self-reported "sharing" behavior and perceived difficulty of self-disclosure using the subscales of personal problems and feelings, responses to health care, and changes in lifestyle during three measurement intervals, 5) to examine the relationship between patients' self-disclosing behavior and perceived difficulty of self-disclosure and outcome variables of blood pressure, heart rate, cardiac output, and/or estimated peripheral resistance, 6) to examine the relationship between patient report of self-disclosing behavior and perceived difficulty of self-disclosure and indices of psychological distress e.g. measures of depression, anxiety, hostility, anger, somatization, and/or cognitive disorganization, and 7) to examine the relationship between client perception of therapist's attributes - of empathic

understanding, unconditionality of regard, level of regard, and congruence - and client self-disclosing behavior, and perceived difficulty of self-disclosure.

CHAPTER TWO

CONCEPTUAL AND THEORETICAL LINKAGES

In this chapter the conceptual framework supporting the investigation of self-disclosure within the context of biofeedback-assisted self-management training will be presented. A logical progression of related concepts and theoretical linkages will be used to explicate the model of self-disclosure in biofeedback of hypertension. Aspects of this discussion include early empirical development of the concept of self-disclosure. The role of self-disclosure within a therapeutic relationship is explored. Major theoretical assumptions regarding the helping relationship are described. Major substantive investigations of the use of biofeedback as an intervention with essential hypertension are critiqued. Theoretical support is given for the conceptualization of hypertension as a repressive disease. The final section of this chapter is a discussion of important empirical and theoretical evidence linking self-disclosure with altered physiological and psychological states.

DEVELOPMENT OF THE CONCEPT OF SELF-DISCLOSURE

Early work by Jourard and colleagues during the sixties and early seventies indicated that there are differences in self-disclosure due to sex, age, race, marital status, and education (Jourard, 1971). These studies

addressed patterns of who disclosed what to whom. The instrument used to measure self-disclosure, the Jourard Self-Disclosing Questionnaire (JSDQ), contains up to sixty items addressing six dimensions: attitudes and opinions, tastes and interests, work (or studies), money, personality and body (Jourard, 1974; Pedersen & Higbee, 1968; Jourard, 1971). Early studies of self-disclosure using the JSDQ concluded that females were more disclosing than males in all age groups (Dimond & Munz, 1967; Pederson & Breglio, 1968; Jourard, 1971; Certner, 1973), patterns of disclosure changed with age and marital status (Jourard, 1971), self-disclosure was usually dyadic (Jourard, 1971; Chaikin, Derlaga, & Bayman, 1975), people disclosed personal information to those who have disclosed to them, the level of intimacy of self-disclosure content between two individuals tended to be complementary in natural relationships, and self-disclosure proceeded gradually with maximum disclosure given to those individuals a person has known for the longest period of time (Murdoch, Chenowith & Rissman, 1969). Disclosure was found to be independent of general measures of intelligence (Jourard, 1971; Cozby, 1973).

SELF-DISCLOSURE IN THE THERAPEUTIC RELATIONSHIP

Information giving and information receiving are crucial elements of the therapeutic relatonship. Self-disclosure by the client early in the process of receiving health care enables the provider to understand the patient's

initial clinical inquiry is to obtain two fundamental types of information:

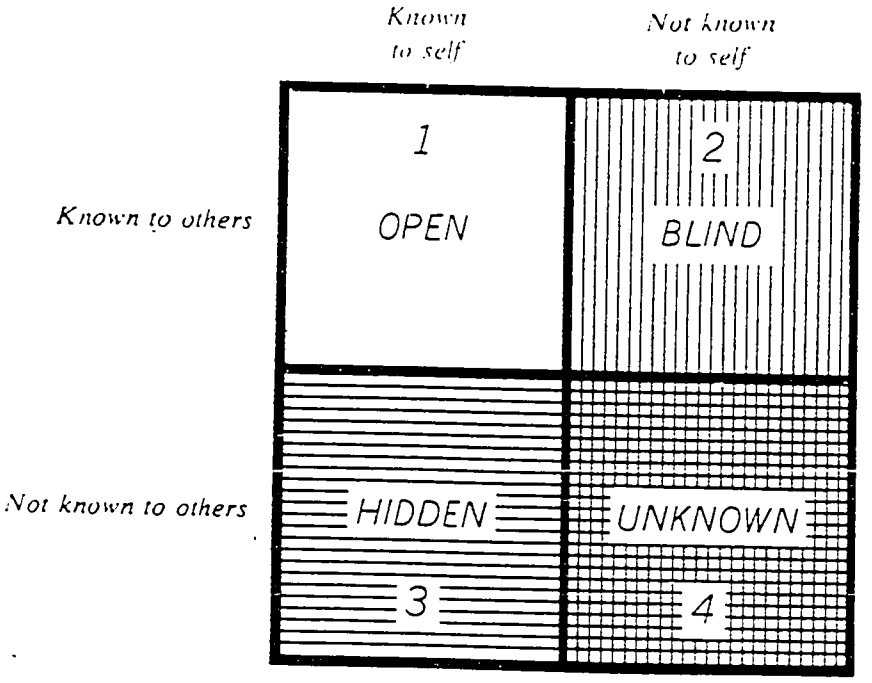
1. A description of the client's problem(s).

2. Information related to what causes the problem. The most important source of this information involves the client's description of the problem; its history, antecedents and consequences.

Janis (1982), investigating aspects of the helping relationship, delineated two key determinants associated with motivational power in the therapist. The phase of Janis' Model of overcoming client resistance is critical. Failure to overcome resistance can prevent an individual seeking help from trusting the clinician or therapist. The key factors, from the therapist's perspective are: 1) giving positive feedback and, 2) eliciting moderate initial self-disclosure (Janis, 1982). According to Janis, clients evaluate counselors' competence, trustworthiness, and readiness to give social rewards such as approval and acceptance (Janis, 1982, p. 28). Accepting response to self-disclosure strengthens the counselor's referent power and ability to build the client's self-esteem. The therapist, as a source of self-esteem, facilitates client commitment to a behavior change program (Carkhuff, 1972; Goldstein, 1975; Janis, 1982). Within Janis' empirically-based model, early moderate self-disclosure by clients is essential to aiding the client to progress through the subsequent stages of the therapeutic encounter to a positive therapeutic outcome.

In developing a model of self-disclosure, the

component of awareness, as well as, willingness to disclose must be considered. Luft, in his book ***Of Human Interaction*** describes, within a model entitled the "Johari Window" (see Figure 2), the dynamic relationship between self awareness, willingness to disclose, and perceptions of others. The four quadrants represent the individual in relation to others. The basis for the division into quadrants is degree of awareness of behavior, feelings and motivation (Luft, 1970). Quadrant 1 is described as the open quadrant and refers to behavior and emotions known to others and to the self. Quadrant 2 is the blind quadrant and refers to behavior and emotions known to others but not to self. Quadrant 3 is the hidden quadrant and refers to behavior and emotions that are known to self but not to others; and quadrant 4 includes behavior, feelings, and motivation known neither to self nor to others (Luft, 1970). Within this proposed framework are contained several principles of change. Among these principles of change are the following: 1) change in the size of one quadrant will affect all other quadrants, 2) it takes energy to hide, deny, or be blind to behavior in interactions, and 3) threat tends to decrease awareness and mutual trust tends to increase awareness (Luft, 1970).



Source: Luft, J. (1970). Of human interaction. Palo Alto, California: Mayfield Publishing Co. p.25.

FIGURE 2: JOHARI WINDOW

Altman and Taylor (1973), in their social penetration model, describe how interpersonal relationships develop gradually. They tend to increase in depth and intimacy over time. Within this model, the phenomenon of self-disclosure develops in a systematic and orderly fashion increasing in amount, intimacy and rate of self-disclosure. Within the context of the "ordinary social relationship disclosure is reciprocal...in dialogue people disclose their thoughts, feelings and actions and are disclosed to in return" (Taylor, 1979, p. 110).

In contrast to the Altman and Taylor model (1973), disclosure in a therapeutic relationship has a distinct pattern and rate which differs from an ordinary social relationship (Jourard, 1971). Self-disclosure is both an intrapersonal and an interpersonal process. It is a means by which an individual becomes "known to others, develops a sense of rootedness or identity in communion or fellowship with others, achieves self-congruence, and acquires positive feelings of self-worth" (Doster and Nesbitt, 1979, p.178). The role of self-disclosure in a therapeutic context has been discussed by major theorists such as Jourard (1971) the private self known; Rogers (1961) a reflection of the uncensored flow of individual experience; Mowrer (1964) the disclosure of negative content similar to a "confession of sins" in religious experience while concealing positive experiences.

One of the primary assumptions associated with the construct of self-disclosure concerns its relation to mental health. Jourard and others argue that the ability to allow one's real self to be known is an indicator of mental health (Jourard, 1971, Raphael & Dohrenwend, 1987). More recent research suggests that this relationship is curvilinear rather than linear (Jourard, 1964; Chaiken & Derlega, 1974; Cozby, 1973; Strassberg, Roback, D'Antonio & Gabel, 1977; Blotcky, Carscaddon & Grandmaison, 1983). The extremes of too little and too much too soon with regard to self-disclosure, particularly in a therapy setting, have been associated with a less healthy personality. However, there is evidence to suggest that the relationship between self-disclosure and psychologic adjustment may be more complex. A study by Truax, Altman and Wittmer (1973) found that disclosure of college-age males to a male friend, perceived to be warm and empathetic, associated with positive psychologic adjustment. However, they found that men who disclosed to friends whom they perceived to be low in the characteristics of warmth and empathy demonstrated less psychologic adjustment (Truax, Altman, & Wittmer, 1973). These results suggest that traits of the object of self-disclosure may influence the relationship between self-disclosure and adjustment.

Young (1979) found that patient disclosure to a physician was enhanced when the physician was more attractive, when the patient was disclosing general, as compared to more

personal or mental illness, symptoms; male patients were more willing to disclose than female patients, and disclosure by patients was enhanced in same sex dyads. In a later study, Young (1980) found that willingness to disclose was enhanced by physician social and technical competence. Truax and Carkhuff (1967) reported significant correlations between amount of disclosure by the patient and amount by the therapist. However, other authors have found that therapist disclosure may be interpreted by the patient as unprofessional and a sign of moral weakness (Abramowitz, Berger, Weary, 1982). The conditions of optimum therapist disclosure remain undefined. In the absence of definitive research, many practitioners have tended to minimize their own self-disclosure in a therapeutic context while striving for early moderate self-disclosure on the part of the patient.

The manner in which self-disclosure is made a viable part of the helping relationship is dependent on the orientation of the helper. The following sections characterize the structure of the helping relationship and the way in which self-management serves as a specified strategy within the context of biofeedback-assisted self-management training, the intervention utilized in this investigation.

THE HELPING RELATIONSHIP

The helping relationship may be viewed as a subset of the larger category of caring relationships. For the

purposes of this discussion, assumptions are made about the helping relationship that distinguish and differentiate it from the larger category of the caring relationship (Brickman, 1982).

1. The helping relationship tends to be contractual.

2. In the helping relationship, the client is viewed as owning the problem and responsible for compensating through physical, cognitive, or behavioral change strategies.

3. In the helping relationship there is greater congruence in patient and therapist perceptions of the process and outcome than is seen in other caring relationships.

4. In the helping relationship, the client is perceived by the therapist to have joint responsibility for, and control over, the outcome of the helping process.

The framework to be incorporated into this proposal is the compensatory model. This model is characterized by the perception of the patient as deprived or deficient; he/she overcomes this state through self-assertion. Others may facilitate this process by aiding the individual to mobilize resources or to facilitate change and growth (Brickman, Rabinowitz, Karuza, Coates, Cohn, & Kidder, 1982).

The model proposed by Brickman (1982), identifies two basic questions which "justify and shape" the interaction between helper and client, 1) where is the attribution of responsibility for the problem?, and 2) where is the attribution of responsibility for the solution of the problem? According to Brickman et al. these judgments "define the meaning and purpose of the intervention" (Brickman, Rabinowitz, Karuza, Coates, Cohn, & Kidder, 1982).

Self-management training is characterized by many of the assumptions of Brickman's compensatory model. The following section addresses assumptions and the theoretical foundation of self-management training. Self-management training is an intervention developed from social-learning (Bandura, 1965); cognitive (Ellis, 1975; Meichenbaum, 1974; Beck, 1976) and psychophysiological (Mason, 1969; Henry and Elly, 1974) theories.

SELF-MANAGEMENT TRAINING

Self-management is the ability of the individual to modify his/her behavior in response to environmental contingencies influencing the individual. The target of analysis and modification may be the individual's response, aspects of the environment, or frequently both (Kanfer & Goldstein, 1977; Karoly & Kanfer, 1982; Nakagawa-Kogan & Betrus, 1984).

Inherent in this mode of intervention is the concept of reciprocity (Lewin, 1969); that is, the person-environment interaction results in changes in both individuals and the environment (Kanfer & Goldstein, 1977; Karoly & Kanfer, 1982). An assumption is made that individuals can effectively and accurately observe and understand their own "private mental processes" or self-talk; i.e. discriminate between person/environment interactions and one's own self-talk interpreting those events (Karoly & Kanfer, 1982).

According to Kanfer and others, self-management training is a method of identifying with a patient, a set of behavioral, cognitive, or physiological responses targeted for self-regulation and therapeutic intervention. This implies that the individual has been experiencing some problematic disregulation. The elements of Kanfer's behavior-focused approach include the following:

1. A self-monitoring or self-observation period is the first stage of this process. During this time the client is guided by the therapist in identifying and delineating the behavior to be targeted. The self-observation process includes monitoring the frequency with which the behavior occurs and the antecedents and consequences surrounding the behavioral occurrence.

2. A joint collaboration between client and therapist to develop specific short-term and/or long-term goals and methods for measuring success in a precise, easily understood, and meaningful manner.

3. This intervention strategy entails a psychoeducational approach. Specific strategies may include cognitive restructuring, modeling of more adaptive behaviors, and increased frequency of stress-reducing activities, e.g. relaxation or physical exercise.

4. Self-reinforcement via an individualized reward system. These rewards act as primary reinforcers in the initial stages prior to internalization of the intrinsic reward (Kanfer & Goldstein, 1977; Karoly & Kanfer, 1982; Nakagawa-Kogan & Betrus, 1984).

BIOFEEDBACK TRAINING FOR ESSENTIAL HYPERTENSION

Hypertension is a major health problem in the United States. An estimated 20% of the population has significantly

elevated blood pressure (Blumenthal, 1985; Egan, 1986; Frohlich, 1986). Hypertension is associated with increased rates of morbidity and mortality. Ninety percent of cases with hypertension have no known etiology and are labeled "essential" (Blumenthal, 1985).

Early biofeedback studies assessing the efficacy of biofeedback in the treatment of borderline hypertension were beset by numerous methodological weaknesses including absence of control groups, small sample sizes, confounding behavioral with pharmacological treatment, and an absence of blood pressure outcome measures assessed outside the laboratory (Chesney, 1986). In spite of these problems, conclusions of these studies were that relaxation therapies, including biofeedback, suggested the presence of significant, although modest reductions in blood pressure (Chesney, 1986; Agras & Jacob, 1981; Jacob, 1983).

In the treatment of hypertension, biofeedback can be used in several ways. One approach is to provide feedback of a physiological variable correlated with a relaxed physiological state such as frontalis EMG, finger temperature, or skin conductance level. Another approach is to provide feedback of blood pressure directly or indirectly. A direct method is through manual or automated sphygmomanometer. This typically involves electronic registration of the Korotkoff sounds. This feedback is by nature intermittent. Continuous feedback methods include pulse transit time and peripheral

blood volume or heart rate. Pulse transit time has been shown to covary with blood pressure at different levels with different activities and therefore is considered to be a less reliable indicator of blood pressure levels than heart rate or peripheral blood volume (Jacob, 1984). Both heart rate and pulse pressure are continuous feedback measures less affected by movement artifact and placement (Nakagawa-Kogan, 1988).

Nakagawa-Kogan et al (1988) utilized a multimodal treatment protocol. Treatment began with EMG biofeedback, added temperature or skin conductance level training, and finally pulse wave velocity was incorporated. The goal of this approach was to progress from a general musculoskeletal focus to the specific target of sympathetic arousal manifested in the peripheral vascular system (Nakagawa-Kogan et al, 1988). The study reported here was designed to delineate the physiological and cognitive predictors of a successful intervention; as well as hemodynamic patterns, in hypertensives who receive biofeedback-assisted self-management training (Nakagawa-Kogan 1986). The multimodal biofeedback treatment utilized by the Nakagawa-Kogan research team consisted of EMG, pneumograph, continuous assessment of heart rate derived from blood volume pulse, intermittent blood pressure, and peripheral temperature (Nakagawa-Kogan, 1986).

PSYCHOLOGICAL CORRELATES OF HYPERTENSION

A number of studies have addressed the issue of a individual personality factors. Individual factors linked to hypertension include the following; hypersensitivity, tendermindedness, submissiveness, inhibited anger or hostility, expressed anger, suppression of emotions, free-floating anxiety, and depression (Marmot, 1985). Marmot points out that much of the early literature (prior to 1980) was flawed by biased sample selection or lack of control groups (Marmot, 1985, p. 203). There are several ways in which psychosocial factors may impact blood pressure: 1) via a direct effect on the neuroendocrine system, 2) social and cultural differences via dietary intake, body weight, and alcohol intake, and 3) health seeking behavior and patterns of compliance to prescribed therapeutic regimens (Marmot, 1985).

Of primary interest to this dissertation, are the direct effects exerted by cognitive and affective influences on the neuroendocrine system and particularly the functioning of the autonomic nervous system. In a recent review of an extensive literature published between 1979-1986 examining psychosocial correlates of hypertension, the authors concluded that there is "strong evidence that a link between psychosocial variables and hypertension exists" (Sommers-Flanagan and Greenberg, 1989, p. 22). Sommers-Flanagan and Greenberg (1989) assert that a portrait of a hypertensive personality begins to emerge. Empirical evidence obtained

from meta-analysis of 48 studies suggests that hypertensive patients are likely to possess the following characteristics: 1) difficulty identifying and expressing aggressive or angry feelings, 2) anxiety and exaggerated psychophysiologic responses to interpersonal situations, 3) the use of denial and repression to cope with underlying conflicts (Sommers-Flanagan and Greenberg, 1989, p. 22).

Recently, attempts to address specific characteristics, such as suppressed aggression, have yielded substantive results. Perini et al. (1986) investigated this problem in an age and sex matched sample with no family history of hypertension. They found, using an analysis that eliminates the effects of anxiety, that borderline hypertensive subjects with suppressed aggression had significantly higher heart rates, diastolic pressures, and greater elevations of noradrenaline than either borderline hypertensive subjects without suppressed aggression or normotensive subjects (Perini et al., 1986). In the Sommers-Flanagan and Greenberg review (1989); the authors found that of 25 studies which included a measure of anger, aggressiveness, or hostility, 84% reported an empirically based relationship between an anger-related construct and elevated blood pressure.

Other authors found that a subset of hypertensive patients and borderline hypertensives demonstrate increased reactivity to mental stress, e.g. mental arithmetic (Schulte

et al., 1986; Nakagawa-Kogan, 1988; Brod et al., 1959). Schulte (1986) found that mental stress resulted in increased systolic and diastolic blood pressure, as well as increased heart rate and cardiac output in a borderline hypertensive sample. Nakagawa-Kogan et al. (1988) found that higher heart rates during a mental task discriminated subjects who succeeded in self-management training of hypertension from those who failed to reduce their blood pressure significantly. Both of these investigators concluded that the borderline hypertensive's response during a mental task implicates an autonomic imbalance in the pathogenesis of a subset of borderline hypertensive patients.

Cohen and Sedlacek (1983) examined the relationship between attention and autonomic self-regulation following biofeedback training of hypertensives. They demonstrated that post-training, those hypertensive adults who had successfully reduced their blood pressure also significantly increased their performance in attentional dimensions (Cohen and Sedlacek, 1983).

The results of these studies suggest that biofeedback training seems to increase the patient's ability to attend to internal bodily cues. The heightened attentional capacity following biofeedback training may be associated with increased ability to regulate physical states (Brenner, 1987; Schwartz, 1987). To date there is a paucity of studies examining the process whereby these effects are achieved.

Specifically, the role of self-disclosure, as a component of the "heightened attentional capacity" within the context of biofeedback-assisted self-management training has not been examined.

SELF-DISCLOSURE AND PSYCHOPHYSIOLOGIC RESPONSES

According to Gray's three arousal model; inhibition of behavior, thoughts, and feelings is tantamount to psychophysiological work (Gray, 1976). This model postulates the existence of a behavioral activation system (BAS), a behavioral inhibition system (BIS), and a nonspecific arousal system that receive excitatory inputs from both the BAS and BIS (Fowles, 1980; Gray, 1976). The behavioral inhibition system is an anxiety system and is associated with increased electrodermal activity (Fowles, 1980). Viewed from a learning theory perspective the BIS inhibits behavior in response to cues for punishment (passive avoidance) or frustration of reward (extinction) (Fowles, 1980, p.87).

Pennebaker et al. (1985; 1986; 1987; 1988), has conducted a series of studies examining the relationship between self-disclosure of traumatic events and physiological responses. This research direction stems from Gray's (1976) theory of inhibition and somatic response. Experiment 1 assessed moment to moment physiological changes occurring as a subject spoke into a tape-recorder about stressful events in his/her life. Skin conductance level, blood pressure and

heart rate were continuously measured. In high self-disclosers talking about trauma was associated with a decrease in behavioral inhibition, as measured by a decrease in skin conductance level and cardiovascular activity (Pennebaker, Hughes and O'Heeron, 1987).

In a second experiment subjects both talked aloud and thought about a traumatic event and plans for the day (an emotionally neutral task). Half the subjects were alone and half spoke to a silent "confessor" behind a curtain. High self-disclosers demonstrated a decrease in skin conductance level in the trauma-speaking condition. The presence of a confessor inhibited subjects talking about trauma (Pennebaker, Hughes and O'Heeron, 1987).

In a series of correlational studies, Pennebaker and colleagues found, in six large samples of corporation employees, links between confiding or disclosing traumatic events and health outcomes. Trauma subjects, who had not confided in others the extent of trauma, were more likely to report both major and minor health problems. Those who had experienced childhood trauma and had not confided to others, demonstrated significantly higher illness scores as well as visits to a physician during the previous year (Pennebaker, 1985; Pennebaker and Beall, 1986).

Another experiment was designed to test whether confiding traumatic experiences had a positive effect on immune function. Pennebaker asked fifty undergraduate

psychology students, randomly assigned to a treatment or control condition, to write about either trivial or traumatic experiences for four consecutive days, twenty minutes each day. Dependent variables included measures of immune function, blood pressure, heart rate, as well as health center records. Subjects in the trauma combination cell; those subjects who had experienced significant childhood trauma not previously confided to others, showed significant improvement in immune system functioning. These differences tended to persist at a six week follow-up. In addition, high disclosers showed a significant decrease in systolic and diastolic blood pressure compared to low disclosers from the beginning to follow-up (Pennebaker, Kiecolt-Glaser and Glaser, 1988).

These studies demonstrate a theoretical and empirical linkage between change in self-disclosure and altered psychophysiolocial functioning. This investigation hypothesizes that within the context of biofeedback-assisted self-management training, change in self-disclosure will be associated with change in the outcome variables of heart rate, blood pressure, and indices of psychological distress.

DIMENSIONS OF THE CONSTRUCT OF SOCIAL DESIRABILITY

Within the model inherent in the Johari Window (Luft, 1973) is the dimension of social desirability. Responses altered to reflect the motivational effects of social desirability are included in quadrant 2, the hidden

quadrant. In a series of studies, Paulhus has developed a two factor model of social desirability responding distinguishing the components of impression management and self-deception (Paulhus, 1986; Paulhus, 1984; Linden, Paulhus and Dobson, 1986).

Impression management is a term used to refer to "conscious dissimulation of responses designed to create a favorable impression in a given audience" (Paulhus, 1986, p.144). Self-deception refers to any positively biased response that an individual believes to be true or partly true. Both of these dimensions have been identified as factors of social desirability responding as measured by commonly used SD instruments including the Marlowe-Crowne scale and the Edwards SD scale (Paulhus, 1984).

A factor analysis of six commonly used social desirability scales found that the Edwards SD scale (Edwards, 1957) loaded almost exclusively along the dimension of self-deception. The Marlowe-Crowne scale (Marlowe and Crowne, 1964) loaded equally on both dimensions of self-deception and impression management (Paulhus, 1984, p. 602).

Sackeim and Gur (1978) have developed four criteria comprising a set of conditions necessary and sufficient for self-deception to occur. These conditions are: 1) the individual holds two contradictory beliefs; 2) the beliefs are held simultaneously; 3) the individual is unaware of holding one of the beliefs; and 4) the lack of awareness may be

attributed to a particular motivation (p.150). While impression management and self-deception share the condition of the presence of conflicting beliefs they are distinguished by awareness (impression management) or lack of awareness (self-deception) of the conflict.

There are at least five distinct "types" of response patterns of impression management. Each of these types is motivated by a different desired response or outcome from the target; a) the ingratiator who wants to appear likeable; b) the intimidator who seeks to be threatening; c) the self promoter who wants to appear competent; d) the supplicant who appears helpless; and e) the exemplifier who desires to appear virtuous (Jones and Pittman, 1982). Whether motivation behind impression management is strategic i.e. the behavior is utilized to increase power over a particular target; or intrinsically motivated e.g. the ingratiator is seeking affection from his/her audience; is under some scholarly debate (Jones and Pittman, 1982; Marlowe and Crowne, 1964).

This debate holds several implications for the measurement of impression management and self-deception. One factor of social desirability responding is the measurement of strategic dissimulation. Accordingly, individuals scoring high on this dimension would tend to "fake any profile which they perceive to maximize their strategic outcomes in a specific context" (Paulhus, 1986, p.154). Another aspect of impression management and self-deception is the desire for

approval. Individuals scoring high on the Marlowe-Crowne scale demonstrate approval-seeking behavior combined with a component of self-deception (Paulhus, 1986). Another source of variability in the dimension of impression management is level of social skill. Snyder (1974) has emphasized the importance of the trait of self-monitoring. Self-monitoring, in this context, is defined as "the concern for social appropriateness manifested by the expression and social presentation of others; and the use of these cues to regulate and monitor self-presentation" (Snyder, 1974, p.528). Self-monitoring is poorly correlated with the Marlowe-Crowne scale, which is predominantly a measure of approval-seeking behavior (Paulhus, 1981).

For the purposes of this investigation, it is hypothesized that patterns of social desirability responding are associated with perceived difficulty of self-disclosure. Furthermore, it is anticipated that, due to the magnitude of social desirability as a motivating factor, perceived difficulty will be resistant to change following the intervention, biofeedback-assisted self-management training. The relationship between the construct of social desirability and the phenomena of psychological repression will be examined in the final section of this chapter.

THE REPRESSIVE COPING STYLE

Many investigators have identified hypertension as a repressive disease (Jamner, Shapiro, Goldstein and Hug, 1991; Warrenburg, Levine, Schwartz, et al, 1991). Repression, for the purposes of this investigation, is defined as a discrepancy between cognitive perceptions and psychophysiological responses (Weinberger, 1986). Individuals who are "repressive" believe that they are not distressed despite evidence which contradicts that belief. This self-deception implies that repressors are 1) motivated to maintain self-perceptions that they have a low rate of negative emotional reactions despite 2) a tendency to respond physiologically and behaviorally in a manner indicative of high levels of perceived threat (Weinberger, 1986; Jamner, Shapiro, Goldstein, and Hug, 1991; Schwartz, 1987; 1990).

Repression involves the lack of attention to vital cues essential to self-regulation. This disordered state is hypothesized to contribute to physical, mental and social diseases. Schwartz (1990) has examined the construct of repression from a systems perspective.

The process of investigating the phenomena of repression involves the development of a reliable and valid method for measurement. Such a process would psychometrically distinguish individuals accurately reporting low levels of negative emotions and people who misrepresent or inaccurately report emotional valence. Weinberger, Schwartz, and Davidson

(1979) successfully differentiated "true low anxious" subjects from subjects who self-deceptively reported low levels of distress. The Marlowe-Crowne Social Desirability Scale enables this differentiation because it measures the two dimensions of self-deception and other-deception (Schwartz, 1990). Thus, a method was developed which divided respondents on a measure of anxiety, Taylor Manifest Anxiety Scale, (MAS; Taylor 1953) into high and low anxious and high and low SD responders. The result was a 2 X 2 table.

TABLE 1: DIFFERENTIATION OF REPRESSORS USING PATTERNS OF SOCIAL DESIRABILITY RESPONDING AND TRAIT ANXIETY.

	Self-Reports of Self-Deception and Impression Management	
	Low	High
Self-Reports of Anxiety		
High	High Anxious	Defensive High Anxious
Low	Low Anxious	Repressor

Source: Psychobiology of Repression and Health: A Systems Approach. Schwartz, 1990.

PURPOSE OF THE INVESTIGATION

The purpose of this study was to examine self-disclosure as a variable which heightens the value of biofeedback, reduces psychophysiologic arousal, and influences the therapeutic relationship between nurse and client.

In the foregoing chapter theoretical and conceptual linkages were advanced in support of major conceptual hypotheses tested in this study. Major areas of investigation include the effect of biofeedback/self-management training for the treatment of essential hypertension on clients' self-disclosing behavior and perceived difficulty of self-disclosure. Currently, there is a paucity of studies addressing the process entailed in biofeeedback/self-management training. Specifically, the psychophysiologic effects of client self-disclosure within the context of biofeedback have not been investigated.

A major goal of this investigation was to examine patterns of change in content and/or amount of self-reported self-disclosing behavior by clients. Change in the perception of the difficulty of self-disclosure was also explored. In addition, male and female patterns of self-reported "sharing" behavior, and perceived difficulty of self-disclosure will be explored in the following chapters.

This investigation will examine the association between change in self-disclosure and a host of psychophysiological variables. Other investigators

(Pennebaker et al. 1986; 1989) found a relationship between high self-disclosure and decrease in systolic and diastolic blood pressure. The present study explores the relationship between client's self-disclosing behavior and perceived difficulty of self-disclosure and major cardiovascular outcome variables including systolic and diastolic blood pressure, and systemic vascular resistance. In addition, change in indices of psychological distress, particularly measures of depression, anxiety, hostility, anger, somatization, and cognitive disorganization are associated with change in self-disclosure.

CHAPTER THREE

EXPERIMENTAL DESIGN AND METHODS

This study is a quasiexperimental longitudinal design with participants acting as their own controls. Clients entering biofeedback/self-monitoring training for treatment of hypertension from an ongoing grant (Nakagawa-Kogan, 1986) were particiapants of this investigation. A convenience sample was drawn from a population of individuals seeking biofeedback self-management training for treatment of essential hypertension. They had been recruited via an advertisement in a local newspaper or referred from their primary health care provider. All participants were evaluated by their primary care provider prior to entry into the study. Under physician supervision, subjects were gradually withdrawn from any hypertensive medication prior to the intervention.

The study, occurred in two stages. Initially, all participants underwent a pre-assessment which included instruments described in this chapter. Following the pre-assessment subjects self-monitored blood pressure for a period up to three months. A significant proportion of the original sample was expected to successfully reduce blood pressure while observing the self-monitoring strategy. The mechanism for this effect remains undefined (Nakagawa-Kogan, 1986). During the self-monitoring period, persons whose blood pressure remained elevated above 90mmHg for 70% or more of

self-monitoring assessments entered the biofeedback/self-management training intervention. Pre and post biofeedback training assessments of the treatment group were performed at entry, and at exit.

In this study, an effort was made to assess the effects of biofeedback self-management training on self-report of self-disclosing behavior and perceived difficulty of self-disclosure. The relationship between patient-perceived therapist attributes and patterns of self-disclosure were also examined. Finally, the relationship between psychophysiologic variables at exit and self-disclosing behavior, as well as, perceived difficulty of self-disclosure were analyzed. The following hypotheses were tested:

HYPOTHESIS 1

Following biofeedback/self-management training for treatment of essential hypertension, client perceptions of self-disclosure will reflect an increase in self-disclosure and/or a decrease in perceived difficulty of self-disclosure.

HYPOTHESIS 2

There will be a correlation between client's perception of self-disclosure and the clinician's perception of the client's self-disclosure.

HYPOTHESIS 3

There will be significant differences in levels of self-reported self-disclosure between men and women, it is predicted that women will report higher levels of self-disclosure, and less perceived difficulty of self-disclosure in the areas of personal problems and feelings, responses to health care, and changes in lifestyle.

HYPOTHESIS 4

Following the intervention, there will be a positive correlation between change in self-reported self-disclosure, and change in indicators of hypertension, blood pressure, heart rate, cardiac output, and systemic vascular resistance at exit; i.e. the greater the self-disclosure during the intervention the greater the decrease in the psychophysiologic indicators.

HYPOTHESIS 5

There will be a positive correlation between change in self-disclosure by the client between session 2 and session 13, and change of scores on one or more of the indices of psychological distress including measures of depression, anxiety, hostility, anger, somatization, and cognitive disorganization; i.e. the greater the self-disclosure during the intervention the greater the decrease in the indices of psychological distress.

HYPOTHESIS 6

There will be a positive correlation between change in self-report of self-disclosure in subjects receiving biofeedback/self-management training; and client perception of one or more of therapist attributes of empathic understanding, unconditionality of regard, level of regard, and congruence; i.e. the greater the self-disclosure during the intervention the stronger the perception by the client regarding favorable therapist attributes.

SAMPLE SIZE

A power analysis was conducted in order to determine adequate sample sizes to achieve significance at alpha =.05 one-tailed, and a power of .80. A sample size of 29-37 subjects was estimated. The Patient Self-Disclosure tool has been assessed by its author as possessing a test-retest reliability of r=.81-.88 for each subscale, as well as the total scale (Dawson, 1985). A correlation of .85 was used for the power analysis calculation. The moderate effect size was

assumed for the calculations. A moderate effect size was selected because, although self-disclosure in the context of biofeedback has not been previously investigated, previous behavioral studies of biofeedback training outcomes have found moderate effects on blood pressure (Chesney, 1986; Agras and Jacob, 1981, Jacob, 1983). Pennebaker's work regarding psychosomatic responses to disclosure of traumas suggests that moderate effects can be expected (Pennebaker and Susman, 1988). In addition, Dawson (1985) utilized the patient self-disclosure instrument to measure differences in perceived difficulty and perceived importance of self-disclosure among hypertensives, diabetics, and control subjects seeking health care for acute problems e.g. flu, colds, urinary tract infections etc. Mean differences between groups were not significant, however the hypertensive group consistently scored 1-3 points higher on perceived difficulty on all subscales. Therefore 1-2 point change in scores of perceived difficulty was assumed for power analysis calculations (Dawson, 1985).

MEASUREMENT OF PROCESS VARIABLES

THE PATIENT SELF-DISCLOSURE QUESTIONNAIRE. Client self disclosure was measured by The Patient Self-Disclosure Questionnaire, a 20 item instrument designed to measure perceived difficulty of self-disclosure by patients to their health care provider (Dawson, Schirmer and Beck, 1984). This instrument taps three

subconcepts in the following subscales: Personal Problems and Feelings, Responses to Health Care, and Lifestyle. Each subscale contains seven items and uses a seven-point Likert scale format.

The Personal Problems and Feelings scale contains items which measure levels of intimacy; e.g. "How difficult is it for you to discuss sources of strain in your marriage or intimate relationship with your health care provider?" The Responses to Health Care subscale measures characteristics about the patient-clinician relationship and adherence to professional advice; "How difficult is it for you to discuss a failure to follow advice given on a previous visit(s)?" The last subscale, the Lifestyle scale contains seven items which address lifestyle behaviors such as amount of alcohol consumed, difficulty sleeping, and exercise habits.

Clients were asked to rate each of the 20 item total scale for the perceived difficulty of self-disclosure. In addition, subjects were asked to rate overall difficulty discussing their concerns with a their clinician by placing an "X" on a one hundred millimeter analog scale. This device provides a measure of convergent validity to the Patient Self-Disclosure Questionnaire. Subjects were asked to complete this questionnaire at prescreening, session 2 and session 13 in their training process.

The Patient Self-Disclosure Questionnaire was adapted for the purposes of this investigation, by this

investigator, to measure actual self-disclosing behavior during a specific training session. In addition to answering perceived difficulty of self-disclosure, the client was asked to respond to the twenty items of the questionnaire on the basis of amount of verbal "sharing" during the training session. The adapted version was modified to include a "not applicable" category. The not applicable category was used if a particular item was not discussed during the training session immediately prior to the administration of the questionnaire. Space was added to write topics discussed during a particular session but not included in the item list. Subjects were asked to complete this adapted version, including the one hundred millimeter analog validity scale, at prescreening, session 2 and session 13 in the training process. Subjects completed Participant's Opinion: Form A and clinicians completed Clinician's Opinion: Form A. The clinician's version of the self-disclosure questionnaire measured independently the clinician's rating of the amount of self-disclosure by the client during the training session. Both subjects and clinicians placed their responses in a sealed envelope addressed to the investigator. Clinicians did not see the client's completed questionnaire.

The Patient Self-Disclosure Questionnaire measures subject self-report of self-disclosure (Participant Form A), subject perceived difficulty of self-disclosure (Participant Form D), and assesses clinician perception of amount of

subject self-disclosure (Clinician Form A). These instruments were scored as follows: 1) the number of not applicable items was calculated. 2) The number of additional items counted. 3) The visual analog scale score determined. 4) The scale mean score calculated by summing item scores and dividing by the number of item responses other than "not applicable". 5) The convergence score of scale mean to analog scale score was calculated.

INSTRUMENT DEVELOPMENT AND ADAPTATION

The three Patient Self-Disclosure Questionnaires in this investigation: Participant Form A (subject self-report of self-disclosure), Clinician Form A (clinician perception of subject's self-disclosure), and Participant Form D (subject perception of difficulty of self-disclosure), were adapted from a tool developed by Dawson (1985). The original instrument was designed to measure the attitude of patients with regard to perceived difficulty and perceived importance of self-disclosure to a health-care provider. Dawson, in a personal communication, stated that a subject's attitude toward self-disclosure is trait-like and not expected to be altered by an intervention (Dawson, 1990).

The reliability of the tool as a whole, as well as, the reliabilities of the individual subscales were assessed. The reliability of the tool measured in the larger prescreened sample (N=46), as well as the reliability of the instrument

obtained from the final sample (N=20) is reported here. The reliability of the Patient Self-Disclosure Questionnaire (all forms) was assessed in the larger prescreened sample for the purposes of tool development. The reliability of the instruments was also measured in the final sample (N=20) to demonstrate that the samples, prescreened (N=46) and final (N=20), were comparable.

The internal consistency of all forms of the Patient Self-Disclosure Questionnaire was assessed using a frequently utilized measure, Cronbach's alpha. Alpha coefficients were obtained for each of the subscales as well as the tool as a whole. The larger prescreened sample (N=46) was utilized to test the instruments with regard to instrument development.

The larger N served as a pilot sample to measure the reliability and validity of the tools in the format developed for this investigation. Alpha values of the measures of self-reported behavior were obtained by recoding "not applicable" responses to "1" or "very little self-disclosure". For each of the adapted forms designed to measure self-report of behavior; i.e. subject self-report of self-disclosure (Participant's Opinion Form A), and clinician perception of subject's self-disclosure (Clinician's Opinion Form A), the subscale alpha values ranged from .60 to .85. The subscale with the lowest internal consistency, reflecting the greatest diversity in item response patterns, was Personal Problems and Feelings. The Responses to Health Care subscale fell between

the other two dimensions of the tool in alpha values on two of the three forms in the large sample. The subscale with the highest internal consistency was Changes in Lifestyle. The reliabilities of the instruments as a whole (twenty items) ranged from alpha equal to .94 for Participant's Opinion Form D (subject perceived difficulty of self-disclosure) minimally modified from the original to .85 for Participant's Opinion Form A (self-report of self-disclosure by the subject). A summary of the reliability results for the prescreened sample is presented in Table 2.

TABLE 2: RELIABILITY OF PATIENT SELF-DISCLOSURE QUESTIONNAIRE PRESCREENING SAMPLE

PARTICIPANT FORM A

SCALE	N	# ITEMS	ALPHA	ITEM ALPHA
PERSONAL PROBLEMS AND FEELINGS	46	7	0.65	0.64
RESPONSES TO HEALTH CARE	46	6	0.68	0.69
LIFESTYLE CHANGES	46	7	0.71	0.71
TOTAL	46	20	0.85	0.84

CLINICIAN FORM A

SCALE	N	# ITEMS	ALPHA	ITEM ALPHA
PERSONAL PROBLEMS AND FEELINGS	45	7	0.60	0.63
RESPONSES TO HEALTH CARE	45	6	0.63	0.61
LIFESTYLE CHANGES	45	7	0.85	0.85
TOTAL	45	20	0.87	0.86

PARTICIPANT FORM D

SCALE	N	# ITEMS	ALPHA	ITEM ALPHA
PERSONAL PROBLEMS AND FEELINGS	46	7	0.94	0.94
RESPONSES TO HEALTH CARE	46	6	0.87	0.86
LIFESTYLE CHANGES	46	7	0.77	0.75
TOTAL	46	20	0.94	0.94

Table 3 presents the reliability values for the final sample (N=20). The alpha coefficients for the smaller final sample are relatively unchanged for Participant's Opinion Form A (subject self-report of self-disclosure). However, alpha coefficient's for the subscales of Clinician's Opinion Form A (clinician perception of subject self-disclosure) are significantly lower than the values obtained in the prescreened sample. Nevertheless, the alpha for the entire tool is .86. The alpha coefficients for Participant's Opinion Form D, a tool designed to measure subject's perceived difficulty of self-disclosure range from .91 for the subscale Personal Problems and Feelings to .45 for the subscale Changes in Lifestyle. Overall, the alpha is .84 for the twenty-item instrument.

The internal consistency for Participant Form A (measuring client self-report of self-disclosure) subscales and total scale was deemed acceptable. Therefore, a decision was made to include subscale and total scale values for Particiapant Form A in subsequent analyses. However, the low Cronbach's Alpha values obtained for the subscales of Clinician's Form A and Participant's Form D suggest that these subscales lack reliability in this population. Therefore, subscale scores for these forms were not included in descriptive and correlational analyses of these data.

TABLE 3: RELIABILITY OF PATIENT SELF-DISCLOSURE QUESTIONNAIRE

FINAL SAMPLE

PARTICIPANT FORM A

SCALE	N	# ITEMS	ALPHA	ITEM ALPHA
PERSONAL PROBLEMS AND FEELINGS	20	7	0.65	0.63
RESPONSES TO HEALTH CARE	20	6	0.76	0.77
LIFESTYLE CHANGES	20	7	0.61	0.65
TOTAL	20	20	0.84	0.84

CLINICIAN FORM A

SCALE	N	# ITEMS	ALPHA	ITEM ALPHA
PERSONAL PROBLEMS AND FEELINGS	20	7	0.36	0.26
RESPONSES TO HEALTH CARE	20	6	0.53	0.48
LIFESTYLE CHANGES	20	7	0.80	0.80
TOTAL	20	20	0.86	0.83

PARTICIPANT FORM D

SCALE	N	# ITEMS	ALPHA	ITEM ALPHA
PERSONAL PROBLEMS AND FEELINGS	20	7	0.91	0.91
RESPONSES TO HEALTH CARE	20	6	0.56	0.54
LIFESTYLE CHANGES	20	7	0.45	0.48
TOTAL	20	20	0.84	0.80

therapeutic relationship was measured by The Barrett-Lennard Relationship Inventory (BLRI). The Barrett-Lennard Relationship Inventory is a 64 item tool contains four subscales sixteen items each (Barrett-Lennard, 1962). The subscales are level of regard, empathic understanding, unconditionality of regard, and congruence. Barrett-Lennard has defined the variable "level of regard" as "the affective aspect of one person's total response to another, projected into a single positive-to-negative continuum" (Barrett-Lennard, 1986, p. 440). Level of regard, according to Barrett-Lennard, does not refer to a generalized interpersonal trait but is relative to the experienced response in a relationship at a particular moment in time (Barrett-Lennard, 1986). Level of regard is the sum of the combined "loadings" of affective reactions of one person to another. The lower end of the continuum represents a "predominance of negative feeling and not merely a lack of positive feeling" (Barrett-Lennard, 1962, p. 4).

Barrett-Lennard defines "empathic understanding" as;

> "an active process of desiring to know the full present and changing awareness of another person and reaching out to receive the other's communication and meaning. This includes translating his words and signs into experienced meaning which matches those aspects of his awareness that are most important at the moment. This is an experiencing of the consciousness behind another's continuous awareness." (Barrett-Lennard, 1986, p. 442.)

According to the definition stated above, empathy is an active

process involving the communication, experiences, and attributions of another individual. This engagement requires that the listener have an accurate grasp of that which is important and central to the other person. Barrett-Lennard has implied that true empathic understanding is a "coexperiencing of features of the other's inner consciousness of which communication is an outward expression" (Barrett-Lennard, 1986, p.442).

Unconditionality of regard is defined as the amount of variability there is in one person's affective response to another. This implies that unconditionality is the degree of constancy of regard two people have for one another. Barrett-Lennard defines the unconditional/conditional continuum as the extent regard is contingent on perceived behaviors, qualities, and attitudes of the other person (Barrett-Lennard, 1986, p.443). Regard that is either generally high or low in level is unconditional. Perceived regard that fluctuates is conditional regard contingent upon the behavior of the person being regarded.

Congruence is defined as;

> "the degree to which one person is functionally integrated in the context of his relationship with another, such that there is absence of conflict or inconsistency between his total experience, his awareness, and his overt communication, is his congruence in this relationship. In brief, optimum congruence means maximum unity, wholeness or integration of the total spectrum or organismic processes in the individual, from physiological to conscious symbolic levels". (Barrett-Lennard, 1962, pp.4-5)

Barrett-Lennard considers the variable of congruence as a basis from which the other variables are derived. Congruence is a measure of one individual's self-awareness as perceived by the regarding person.

The tool was designed to measure therapist attributes as perceived by the patient. Each subscale contains sixteen items with a positive or negative valence. Items are rated on a six point scale (-3 = I strongly feel that it is not true; +3 = I strongly feel that it is true). Satisfactory split-half reliabilities were obtained for each subscale; level of regard, .93; empathic understanding, .86; congruence, .86; and unconditionality of regard, .82 (Barrett-Lennard, 1962; Gurman, 1977; Ponterotto and Furlong, 1985). Test-retest reliabilities over a four week period were level of regard, .84; empathic understanding, .89; congruence, .86; and unconditionality of regard, .90 (Barrett-Lennard, 1962).

This tool and many modified forms have been used extensively in clinical and academic settings. It was validated in actual counseling situations more frequently than in analogue settings (Ponterotto and Furlong, 1985).

This test was administered to the biofeedback/self-management group after the seventh training session. This tool was utilized to tap the dimension of perceived therapist support in the model of self-disclosure in the context of biofeedback-assisted self-management training.

Reliability assessments of the Barrett-Lennard

Relationship Inventory demonstrated very low internal consistency ratings (Cronbach's alpha) of the four subscales of the tool. See Table 4. These findings imply that the instrument was a relatively unreliable measure in this sample. As a result of the reliability assessment, only the total scale score of the BLRI was used as an indicator of the client's perception of the therapist's clinical attributes in subsequent analyses.

TABLE 4: RELIABILITY OF BARRETT-LENNARD RELATIONSHIP INVENTORY

SCALE	N	# ITEMS	ALPHA	ITEM ALPHA
LEVEL OF REGARD	20	16	0.61	0.49
EMPATHIC UNDERSTANDING	20	16	0.68	0.55
UNCONDITIONALITY OF REGARD	20	16	0.66	0.63
CONGRUENCE	20	16	0.40	0.08
TOTAL	20	64	0.86	0.82

OUTCOME VARIABLES

SYMPTOMS OF STRESS INVENTORY. The Symptoms of Stress Inventory (SOS) is a ninety-four item tool developed from the Cornell Medical Index (Thompson and Leckie, 1976). It measures physiological, behavioral, and cognitive components of the stress response. The SOS contains a total scale score and ten subscales which include peripheral manifestations, cardiopulmonary symptoms, central nervous system symptoms, gastrointestinal symptoms, muscle tension, habitual patterns, depression, anxiety, anger (emotional irritability) and cognitive disorganization. Subscales contain a range of 6-15 items each. Each item is rated on a 0-4 point scale of occurrence frequency from not at all to very frequently.

The first five of these subscales is a measure of a set of signs and symptoms associated with a bodily area or system. These physiological systems include: peripheral manifestations, cardiopulmonary signs and symptoms, central nervous system symptoms (neurological symptoms), gastrointestinal symptoms, and patterns of excessive and distressing muscle tension. The habit patterns subscale is a measure of behavioral symptoms of stress. The remaining four subscales are cognitive/affective measures of particular dimensions of psychological distress including; depression, anxiety, anger, and cognitive disorganization. The depression subscale measures behavioral patterns and affective states associated with the clinical appearance of depression. The

anxiety subscale, similarly, measures physiological response patterns and affective states subsumed in the experience of anxiety. The cognitive disorganization subscale measures behavioral patterns and cognitive/affective responses which constitute this dimension.

The SOS was designed to measure the multidimensional construct of stress. It has demonstrated validity including face validity, as evidenced by assessments of nurses in clinical practice, faculty, and lay persons, and criterion validity. It correlated highly with the SCL-90, a well-validated and reliable measure of psychological distress, in a sample of 800 subjects with stress-related diseases. In the citation an r=.82 value between total scale scores was obtained (Thompson and Beaton, 1980). Also, the internal consistency of the entire tool is .97 (Cronbach's alpha). Coefficients range from .62 for the neurological symptoms scale to r=.91 for the anger subscale (Thompson and Beaton, 1980).

THE SYMPTOM CHECKLIST 90-R. The Symptom Checklist 90-R (SCL-90) (Derogatis, 1975) is a ninety item self-report system inventory designed to primarily reflect psychological symptom patterns of psychiatric and medical patients. Each item is rated on a five point scale of "distress" ranging from 0-4. Item responses range from "not at all" which corresponds to "0" to "extremely" which corresponds to "4". The SCL-90 is

scored and interpreted on the basis of nine primary "symptom dimensions" and three global indices of distress. The nine scales of the SCL-90 and two of the global indices were used in this investigation. Particular emphasis was placed on the first five subscales of somatization, interpersonal sensitivity, depression, anxiety, and hostility because they reflect the multiple dimensions of the psychological impact of the stress-response on the individual.

The first of these subscales, somatization, is defined as "distress arising from the perception of bodily dysfunction." The physiological symptoms described are those associated with the cardiovascular, gastrointestinal, and respiratory systems. All of these symptom patterns are largely mediated by the autonomic nervous system. Symptoms include abdominal distress, cold hands or feet, asthma, and somatic expressions of anxiety such as trembling and hyperhidrosis. Derogatis (1976) emphasized that the signs and symptoms included were prevalent in functional disorders; but all may be reflections of a pathological process.

Interpersonal sensitivity assesses the affective responses of an individual in relation to others especially with regard to personal inadequacy. Derogatis has found that individuals with high scores on the interpersonal sensitivity scale tended to report acute self-consciousness and more negative expectations concerning their relationship with others.

The depression subscale measures a broad range of symptoms of depression such as, signs of withdrawal of interest in life, lack of motivation, loss of energy, and feeling of hopelessness.

The anxiety scale is a measure correlated with "manifest anxiety". Symptoms included in this scale are both cognitive and somatic. Examples of symptoms comprising this dimension are nervousness, pounding or racing heart, and spells of terror or panic.

The hostility subscale reflects thoughts, feelings, and behavior associated with hostility. Items included in this dimension assess qualities such as aggression, irritability, rage, and resentment.

In addition, three global scores were assessed; the positive symptom total (PST), the positive symptom distress index (PSDI), and the grand total (GT). Each of these measures indicates separate aspects of "global distress". The PST is a total of the number of symptoms endorsed by the client. The PDSI is a measure of the "response style" of the individual. The grand total is a sum of the number of items endorsed and the intensity of item endorsement.

The SCL-90 is a tool developed in 1976 and has been very widely used (Derogatis, Rickels & Rock, 1976). Test-retest reliabilities of the scales on the SCL-90 range from .77 to .90 within one week between testings. The validity of the SCL-90 was assessed using several aspects of validity

including criterion and discriminative validity. Several studies comparing the SCL-90 and the MMPI demonstrated relatively high correlations between like constructs on both measures (Derogatis, 1977; Derogatis, Abeloff and McBeth, 1977; Derogatis, 1982). The instrument effectively discriminated psychopathology in a variety of medical populations including oncology, stress-related disorders, and depressed patient samples (Derogatis, 1976; Saltzman, 1977; Weismann, 1976).

SOCIAL DESIRABILITY MEASURES. According to Paulus, the Marlowe Crowne Social Desirability Scale (MCSD) correlated with the Edwards Social Desirability Scale at r=.28 (Paulus, 1988). In a factor analysis of measures of social desirability responding, Paulus found that the Marlowe-Crowne scale loaded equally on both the dimensions of impression management and self-deception. The Marlowe-Crowne scale is highly correlated with approval-seeking behavior (Paulus, 1986). Internal consistency ratings for the 33-item Marlowe-Crowne scale range from .83 to .91 (Cronbach's alpha) (Paulus and Leavitt, 1984).

The Edwards Social Desirability Scale (EDSD) is a tool developed from the lie scale of the MMPI (Edwards, 1957). The Edwards scale is the most widely used measure of social desirability responding. The tool is a 39-item tool which measures individual differences in social desirability responding. A factor analysis of six commonly used social

desirability scales found that the Edwards SD scale (Edwards, 1957) loaded almost exclusively along the dimension of self-deception (Paulhus, 1986). The tool measures social desirability responding by dividing the scale into two parts. The first part is keyed for socially desirable responses; the second part is keyed for socially undesirable responses. Thus, the total score an individual obtains reflects the number of times that person endorses a socially desirable response and rejects the socially undesirable response. The distribution of scores is negatively skewed. Internal consistency ratings of the tool range between .83 to .95 (Cronbach's alpha) (Edwards and Walker, 1962; Edwards, Diers, and Walker; 1963; Cartensen and Cone, 1983). Acceptable reliability and validity have been obtained for this tool (Edwards, 1970).

PSYCHOPHYSIOLOGICAL STRESS PROFILING. The psychophysiological assessment consisted of measurement of patient physiological responses to brief (30 seconds to two minutes) simulated laboratory stressors interspersed with two minute rest periods. The simulated stressors included a mental arithmetic task (solving serial sevens), and a emotional image task, and a cold pressor task. Tasks were presented randomly and the instructions given by audiotape. The physiological assessment included the following modalities:

1. **Electromyography (EMG).** Frontalis and trapezius surface EMG levels will be assessed continuously during the protocol. These areas are often assessed during stress profiling and biofeedback training. The EMG data are gathered via a J and J M57 Electromyograph which employs three silver/silver chloride electrodes applied superficially to the skin over the muscle site. Two minute averages will be calculated from these data. These data serve as sources of feedback for the subject, but are not included in the research data.

2. **Skin Conductance Level (SCL).** Electrodermal activity has been used frequently in the assessment of "emotional response, orienting, and arousal mechanisms, and stimulus response relationships" (Nakagawa-Kogan et al., 1980). SCL will also be assessed on a continuous basis and two minute means and standard deviations will be obtained. The SCL assessments will be used as feedback only.

3. **Finger Temperature.** Skin temperature can be utilized as a gross indication of psychophysiologic arousal. Skin temperature is also influenced by such factors as climate, blood viscosity, skin condition and the presence or absence of certain chemicals in the blood. Ambient temperature will be monitored during the assessment and recorded. The J and J T-68 will be utilized to detect surface temperature at the site of application. The degree of relative peripheral circulation can be extrapolated from finger temperature. Finger temperature will not be included in the data analysis.

4. **Blood Pressure, Mean Arterial Pressure, and Heart Rate.** Blood pressure will be assessed using an automated pressure sensitive sphygmomanometer the Dinamap 1846 at two minute intervals during assessment. The Dinamap uses an automatically inflated cuff and detects the oscillatory pulse wave form. The cuff is deflated in stages. The systolic pressure is measured at the point when

oscillation is initially detected. The diastolic pressure is identified as the point at which no further oscillation of the signal is detected. The mean arterial pressure (MAP) is calculated at the point of maximal oscillation of the signal. The heart rate is also measured by the Dinamap and is detected during cuff deflation. All indices are displayed digitally at preprogrammed intervals. The subject's blood pressure, mean arterial pressure and heart rate will be utilized as research outcome data.

5. **Cardiac Output, Cardiac Index, Stroke Volume, Stroke Index and Systemic Vascular Resistance.** Cardiac output and an estimate of peripheral resistance will be measured noninvasively via the Ultracom. The Ultracom uses a continuous wave Doppler ultrasound to assess the velocity of blood flow at the aortic root during systole. In addition, it measures the cross-sectional diameter of the aortic root with freeze frame A-mode echocardiography. This information combined with the patient's height and weight allows the Ultracom to calculate cardiac output, cardiac index, stroke volume, stroke index and heart rate over a 12 beat interval. This information is printed and displayed on a screen. The Ultracom has been tested against established invasive procedures in three separate studies (Huntsman et al., 1983; Chandraratna et al., 1984; and Nishimura et al., 1984). Against simultaneous thermodilution the Ultracom was correlated r=.94 (Huntsman et al., 1983); r=.94 in the Nishimura study (1984); and r=.97 in the Chandraratna (1984) investigation. Systemic vascular resistance will be calculated using the following formula: (mean arterial pressure/cardiac output) X 80.

BIOFEEDBACK/SELF-MANAGEMENT TRAINING PROTOCOL

Self-management training using biofeedback as a therapeutic modality was an intervention two months in duration, with training sessions occurring two times per week

for one month and once per week thereafter. Subjects received a total of fourteen biofeedback training sessions. Training sessions followed the protocol and structure detailed in the training manual (see Nakagawa-Kogan 1986).

Each one hour training session is structured to include time to discuss the subject's progress, his or her immediate issues or concerns, and his/her coping style in response to environmental and interpersonal stressors. Cognitive strategies are presented and discussed and relaxation techniques are demonstrated. The focus of relaxation training is generalized relaxation or decreased sympathetic and/or increased parasympathetic tone. Several different methods for relaxing are presented including progressive relaxation, the quieting response, autogenic imagery, and visualization techniques. The remaining twenty to thirty minutes of the session is devoted to biofeedback training.

Multimodal biofeedback was used including the following physiologic modalities EMG, finger temperature, heart rate and blood pressure. Biofeedback training is designed to increase self-awareness of bodily states, heighten self-disclosure and increase the subject's attentional capacity. Another important aspect of biofeedback training is the use of this modality to reinforce effective relaxation skills.

Biofeedback training is structured to encourage

learning from the specific to the general, and from the easier to the more difficult. All sessions were devoted to teaching diaphragmatic breathing using a photoplythesmograph for continual heart rate feedback and a pneumograph to feedback chest expansion patterns.

Control of autonomically mediated modalities was the objective in all training sessions. Hand warming using thermal biofeedback coupled with relaxation techniques was used to reduce generalized sympathetic arousal. As training progressed, finger temperature, muscle activity and blood pressure continued to be monitored. However, emphasis of training shifted to respiratory sinus arrhythmia feedback and rate and depth of abdominal breathing to regulate heart rate and reduce blood pressure.

STATISTICAL ANALYSIS

Initially the data were compiled into multiple records using the SPSS-PC. The data collected by the Nakagawa-Kogan (1986) investigation were stored by record according to type of data contained and time data were obtained. Psychometric and psychophysiologic data used for this investigation were accessed through the data files compiled in the Nakagawa-Kogan study. Data were collected at three time points; entry to the self-monitoring period (prescreening), entry into the training phase (session 2), and at exit from biofeedback/self-management training (session

13).

Approximately the same amount of time elapsed between prescreening and session 2 as between session 2 and session 13. However, there was a qualitative difference between the discourse of the prescreening interview and the therapeutic structure during the intervention. Measures taken following session 2 and session 13 of the intervention were indicative of the relationship occurring during the intervention. Therefore, prescreening values of the instruments were not used in the analyses of change in self-disclosure and change in outcome variables.

The first stage of data analysis was a review of all data in descriptive form. This enabled the investigator to examine patterns of means over time as well as the distribution of variables. Demographic characteristics of the sample were delineated e.g. age, sex, education, marital status, and medical history. Secondly, the reliability of instruments was assessed using a measure of internal consistency, Cronbach's alpha, for the Patient Self-Disclosure Questionnaire Participant Form D, and the Barrett-Lennard Relationship Inventory. The tools as a whole were assessed for internal consistency; in addition subscale reliability was measured. Internal consistency determinations were made for the Patient Self-Disclosure Participant Form A and Clinician Form A by recoding the "not applicable" category to "1" or "very little self-disclosure". Alternatively,

concurrent validity was assessed using the analog scale. The sample correlation between the mean scale score and the visual analog scale was obtained.

The second stage of data analysis addressed the research question framed by hypothesis 1. The goal of hypothesis 1 was to test the assumption that biofeedback/self-management training results in an increase in self-reported self-disclosing behavior and/or a decrease in perceived difficulty of self-disclosure. The Patient Self-Disclosure Questionnaire was the tool utilized to measure levels of client self-report of self-disclosure, clinician perception of client self-disclosure, and client perceived difficulty of self-disclosure.

Hypothesis 1 was tested by the use of paired t-tests of subscale mean scores at the two time points to test for statistical significance. In addition, paired t-tests of scale mean scores and visual analog scale scores per time point were obtained. Statistically significant differences between session 2 and session 13 will be reported.

Hypothesis 2 was tested by assessing the degree of association using Pearson's Product Moment between scale mean scores on Clinician Form A (clinician perception) and Participant Form A (subject self-disclosure) for each time period. Similarly, visual analog scale scores on both tools were correlated for each time point.

Hypothesis 3 was tested via the use of paired

t-tests of subscale mean scores for men and women at two measurement intervals. Statistically significant differences between men and women will be identified.

To test hypotheses 4-5, change in self-disclosure was measured by subtracting the client's visual analog score obtained at session 13 from the VAS score from session 2. Change scores for all outcome variables were calculated assessing change between screening and exit. Data was tested for main effects for all variables i.e. data was analyzed to determine if change occurred. Secondly, the degree of change was determined. The final step utilized Pearson's Product Moment test for association between measures and the distribution of scores was examined with the use of scatterplots.

The purpose of Hypothesis 6 was to assess the presence of association between patient self-report of self-disclosing behavior and patient perception of therapist attributes of empathic understanding, unconditionality of regard, level of regard and congruence. This hypothesis was tested using the total scale score only due to the results of the reliability assessment of the subscales reported earlier. This hypothesis was tested by correlating the subject's responses on the Barrett-Lennard Relationship Inventory with change scores in patient self-disclosure questionnaires between sessions 2 and 13.

CHAPTER FOUR

REPORT OF FINDINGS

In this chapter the results of data analysis and a report of major findings will be presented. The chapter is divided into the following sections: initially, the sample will be described with regard to demographic characteristics and hypertension-related health history. Secondly, results of the convergent validity analysis of the total scale mean score and the visual analog scale of the patient self-disclosure questionnaire is presented. The final section is a discussion of the results of the a priori hypothesis testing, utilizing the statistical methods described in the preceding chapter.

DESCRIPTION OF THE SAMPLE

The biofeedback-assisted self-management training sample consisted of twenty subjects. Table 5 describes the demographic characteristics of the sample. The final sample consisted of ten men and ten women. The majority were Caucasian, married, and living with spouse, relatively well-educated with incomes in excess of $3000 per month. Table 6 summarizes the hypertension-related health history of the sample as a whole. The median duration of diagnosed hypertension was 5 to 10 years. The degree to which these men and women sought medical advice for their hypertension is reflected in the number of visits to their physician or other health care provider during the year, as well as frequency of

health-related visits to a health care provider for other reasons. The median number of visits for hypertension was one visit per year. The median number of visits for health-related issues other than hypertension was also one visit per year.

The family history of the sample reflects that the majority had no family history of myocardial infarction however, the vast majority identified two family members or more also diagnosed with hypertension. This finding reflects a strong family history of hypertension in this group of subjects. This is consistent with other recent investigations exploring the incidence of hypertension in families (Jorgensen, Houston, 1981; Egan, 1988; Frohlich, 1986).

NON-PARTICIPANTS

Of the 46 subjects who were recruited and prescreened for this investigation, 26 or 54% were not included in the final sample. Most, not included in the final sample, did not meet the inclusionary blood pressure criteria during the self-monitoring phase. Their blood pressure logs reflected a daily mean self-monitored unmedicated blood pressure below the 90mm Hg diastolic minimum value or in excess of the 95mm Hg diastolic maximum value necessary for inclusion in the investigation.

Twenty-four subjects met the inclusionary blood pressure criteria and were screened for participation in the

intervention. Only three subjects dropped out of the investigation after entry to the biofeedback/self-management training phase of the intervention. One subject was eliminated from the final sample because he did not complete the prescreening questionnaires. The remaining three subjects dropped out between sessions 7 and 14 of the intervention for individual reasons. The final sample size was twenty subjects.

TABLE 5: DEMOGRAPHIC CHARACTERISTICS OF SAMPLE (N=20)

DESCRIPTION OF SAMPLE (n=20)

n = 20	10 Male	10 Female
Median Age:	52 years	49 years
Race:	18 Caucasian; 1 African-American; 1 Asian	
Marital Status:	13 Married; 4 Divorced; 3 Widow	
Education:	9 - 12 grade	1
	Vocational Technical or Business School	1
	Some College	6
	AA degree	1
	BA or BS	6
	MA or MS	5
Income Per Month:	$251 - 500	1
	$1001 - 1500	2
	$1501 - 2000	4
	$2001 - 3000	3
	$3001	10

TABLE 6: HYPERTENSION-RELATED HEALTH HISTORY (N=20)

Duration of Hypertension:	Number of Subjects
6 Months to 1 Year	6
1 Year to 2 Years	1
2 Years to 5 Years	4
5 Years to 10 Years	6
10 Years to 20 Years	2
More Than 20 Years	5
Median	5 to 10 years

Number of Times Seen by Physician for Hypertension During the Past Year:	Number of Subjects
0 Visits	6
1 Visit	5
2 Visits	3
4 Visits	3
5 Visits	3
Median	3 visits

Number of Times Seen by Physician For Health During Past Year:	Number of Subjects
0 Visits	6
1 Visit	6
3 Visits	1
4 Visits	1
7 Visits	1
24 Visits	1
Median	3 visits

Family History of Myocardial Infarction:	Number of Subjects
0 Family Members	11
1 Family Member	6
2 Family Members	2
4 Family Members	1
Median	1 family member

Family History of Hypertension:	Number of Subjects
0 Family Members	2
1 Family Member	7
2 Family Members	4
3 Family Members	4
4 Family Members	2
5 Family Members	1
Median	3 family members

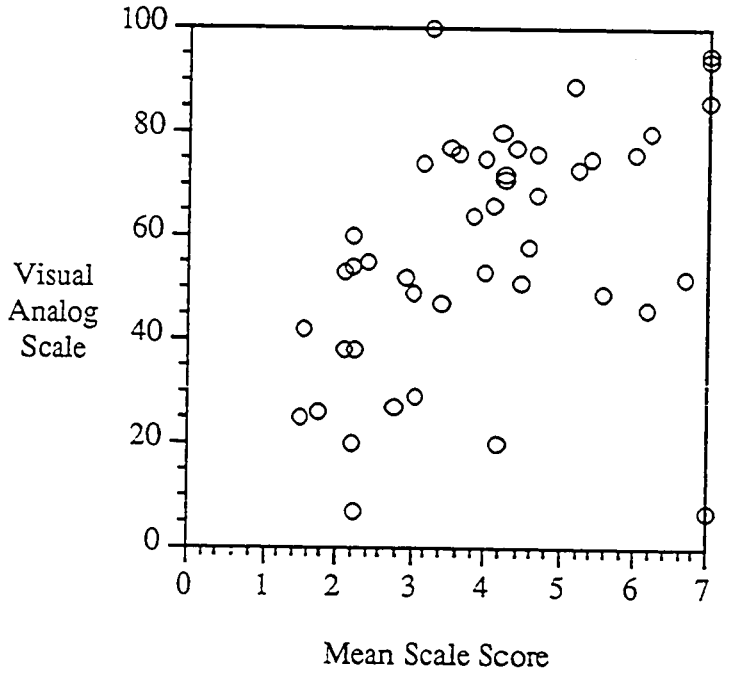
CONVERGENT VALIDITY OF THE ADAPTED PATIENT SELF-DISCLOSURE QUESTIONNAIRE

The adapted Patient Self-Disclosure Questionnaire incorporates a visual analog scale as a measure of convergent validity. To test the relationship between the analog score and the total scale item mean, Pearson's Product Moment correlation coefficient was utilized.

Scatterplots illustrating the results of these analyses for each form of the questionnaire, for the larger prescreened sample (N=42), are presented in Figures 3-5. The correlations of visual analog scale score with total scale item mean for the instruments ranged from r=.69 for a measure of clinician perception of subject self-disclosure (Clinician's Opinion Form A), see Figure 4, to r=.39 for a measure of subject perceived difficulty of self-disclosure (Participants Opinion Form D), see Figure 5. The presence of 2-3 outliers probably significantly lowered the correlation coefficients of two of the instruments. All correlations were significant at p=.01 or less two-tailed.

The findings of a similar analysis, correlating the visual analog scale score with total scale item mean as a measure of convergent validity in the final sample (N=18), are presented in Figures 6-8. This information is included to demonstrate the comparability of the subsample to the larger sample. Relative to the prescreened sample, the correlation coefficients are higher in the smaller sample. This may

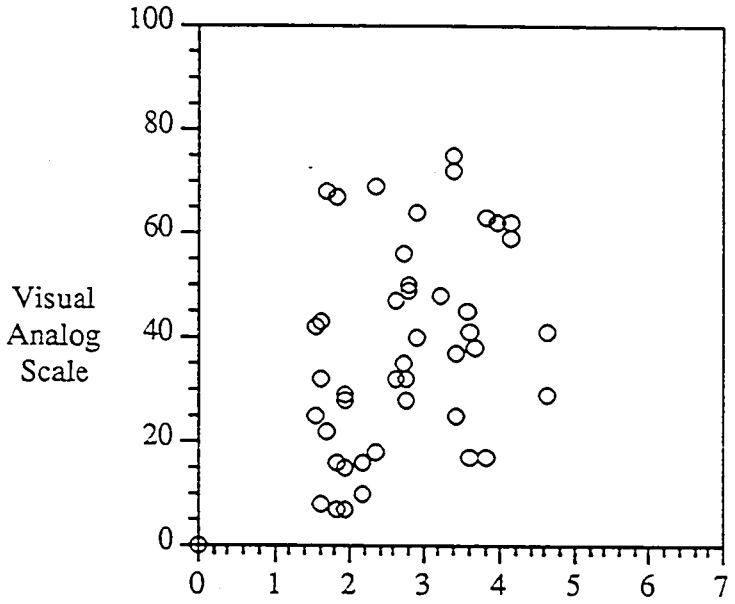
reflect learning to use the analog scale more accurately as the study progressed.



r = .45

p = .006 (two-tailed)

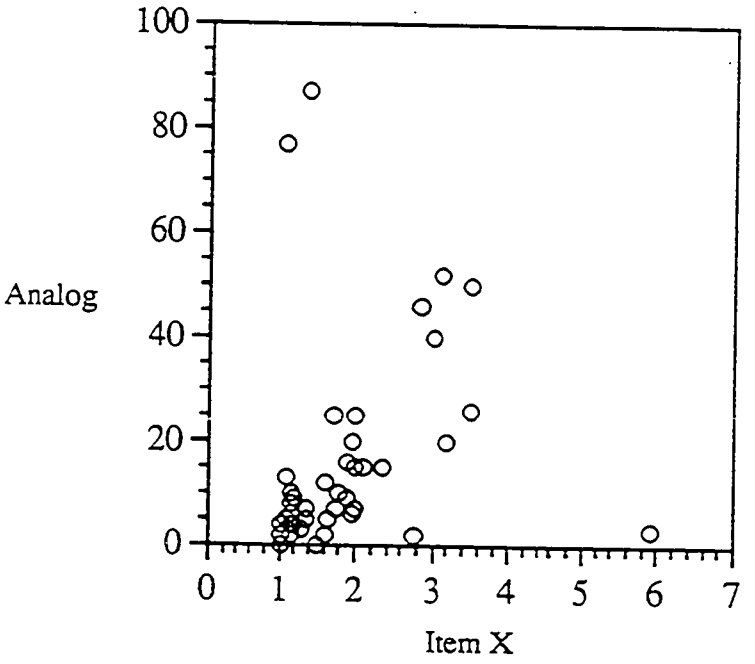
FIGURE 3: CORRELATION OF PATIENT SELF-DISCLOSURE QUESTIONNAIRE VISUAL ANALOG SCALE SCORE AND MEAN SCALE SCORE PARTICIPANT'S OPINION: FORM A (N=42)



r = .69

p = .000 (two-tailed)

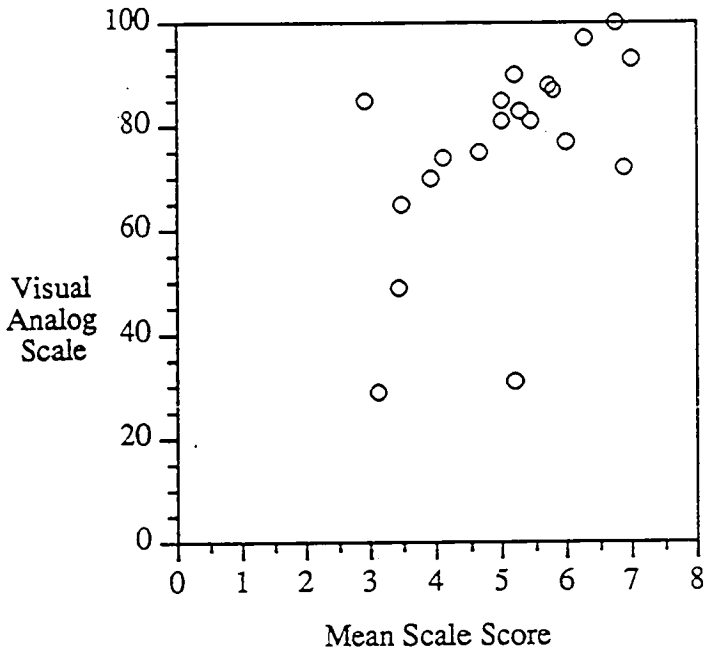
FIGURE 4: CORRELATION OF PATIENT SELF-DISCLOSURE QUESTIONNAIRE VISUAL ANALOG SCALE SCORE AND MEAN SCALE SCORE CLINICIAN'S OPINION: FORM A (N=42)



p = .01 (two-tailed)

r = .39

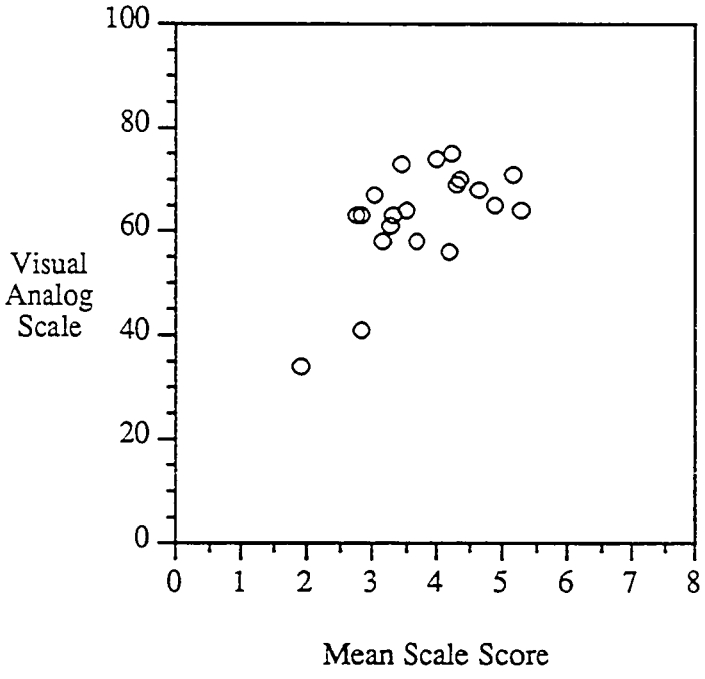
FIGURE 5: CORRELATION OF PATIENT SELF-DISCLOSURE QUESTIONNAIRE VISUAL ANALOG SCALE SCORE AND MEAN SCALE SCORE PARTICIPANT'S OPINION: FORM D (N=42)



r = .65

p = .004

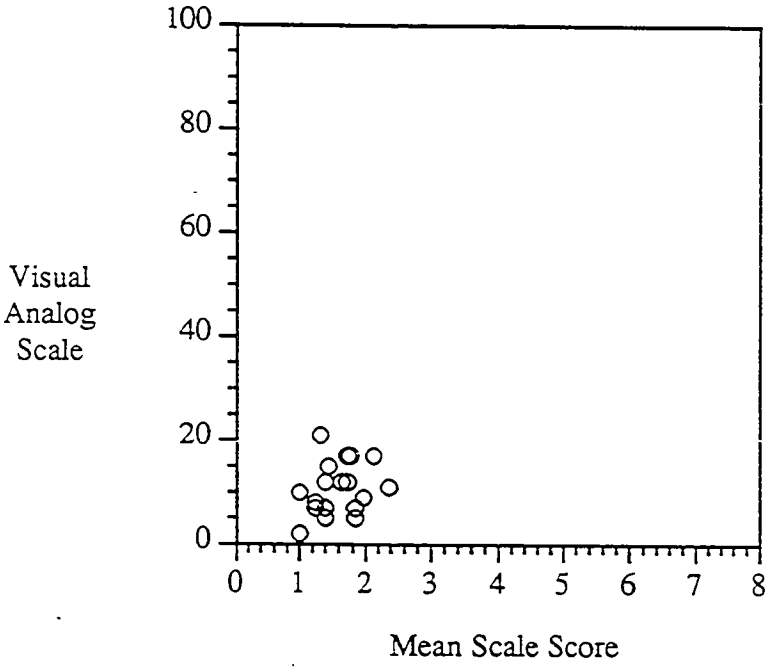
FIGURE 6: CORRELATION OF PATIENT SELF-DISCLOSURE QUESTIONNAIRE VISUAL ANALOG SCALE SCORE AND MEAN SCALE SCORE PARTICIPANT'S OPINION: FORM A (N=18)



r = .60

p = .008

FIGURE 7: CORRELATION OF PATIENT SELF-DISCLOSURE QUESTIONNAIRE VISUAL ANALOG SCALE SCORE AND MEAN SCALE SCORE CLINICIAN'S OPINION: FORM A (N=18)



r = .44

p = .02 (two-tailed)

FIGURE 8: CORRELATION OF PATIENT SELF-DISCLOSURE QUESTIONNAIRE VISUAL ANALOG SCALE SCORE AND MEAN SCALE SCORE PARTICIPANT'S OPINION: FORM D (N=18)

The results of the convergent validity analysis for the Patient Self-Disclosure Questionnaire, presented in the previous section, found a significant correlation between the "global" indicators of the visual analog scale score and the total scale item mean score. These results demonstrate the construct validity of the tool.

The total scale item mean was obtained by eliminating items the subject indicated as "not applicable". The mean number of items endorsed as "not applicable" by participants was 10 items or fifty percent of the total. The total scale item mean represented mean item responses on a range of 5 to 20 items. Therefore mean values for the total scale lacked validity.

The visual analog scale score was selected as the measure of global self-disclosure in subsequent analyses of self-disclosure. The visual analog scale avoided the limitations of recoding and patterns of item response by the participants. It was not obtained by manipulation of the "not applicable" responses. In addition, the visual analog scale demonstrated a greater standard deviation and better score distribution. Therefore, the visual analog scale was deemed to be a more consistent and reliable indicator of level of self-disclosure.

As described earlier, an *a priori* method was used for hypothesis testing. Due to the small N of the final sample (N=20), statistical analysis was limited to descriptive statistical methods and methods measuring association between variables. Multiple regression methods of statistical analysis could not legitimately be performed with a sample of this size.

HYPOTHESIS 1

Following biofeedback/self-management training for treatment of essential hypertension, client perceptions of self-disclosure will reflect an increase in self-disclosure and/or a decrease in perceived difficulty of self-disclosure.

This hypothesis reflects a primary objective of this investigation, to demonstrate an increase in self-disclosure on the part of subjects following the intervention. This hypothesis was tested using a commonly used descriptive method of testing for significant statistical differences between sample mean scores for the three subscales at two measurement time points, correlated Student's T Test. Tables 7-9 illustrate the results of a descriptive analysis of the self-disclosure data. The data obtained from the final sample is depicted in Figure 9, at the two time points with significance differences between subscale scores highlighted.

According to subjects' self-report (Participant Form A), there was a significant increase in self-disclosure along the dimension of Responses to Health Care in session 13 relative to session 2. There was a decrease in amount of disclosure in

dimension of Responses to Health Care in session 13 relative to session 2. There was a decrease in amount of disclosure in the subscale of Changes in Lifestyle on Participant Form A (subject self-report) from session 2 to session 13. There was a significant increase in the total mean scale score of self-disclosure (calculated by recoding not applicable item responses to very little self-disclosure), as reported by subjects (Participant Form A) between session 2 and session 13 ($p=.05$). The clinicians reported a corresponding increase in total mean scale score between session 2 and session 13 ($p=.001$). There were no significant differences between session 2 and session 13 in total scale item mean scores of the Patient Self-Disclosure Questionnaire Form D (a tool which measures perceived difficulty of self-disclosure).

**TABLE 7: DESCRIPTIVE STATISTICS:
PATIENT SELF-DISCLOSURE QUESTIONNAIRE: PARTICIPANT FORM A
FINAL SAMPLE**

PARTICIPANT FORM A: SESSION 2

SCALE	N	MEAN ITEM SCORE	STANDARD DEVIATION	STANDARD ERROR
PERSONAL PROBLEMS AND FEELINGS	20	2.45	0.77	0.21
RESPONSES TO HEALTH CARE	20	2.48	0.67	0.15
LIFESTYLE CHANGES	20	2.66	0.86	0.19
TOTAL	20	2.27	0.62	0.15

PARTICIPANT FORM A: SESSION 13

SCALE	N	MEAN ITEM SCORE	STANDARD DEVIATION	STANDARD ERROR
PERSONAL PROBLEMS AND FEELINGS	20	2.45	0.77	0.17
RESPONSES TO HEALTH CARE	20	2.94	0.87	0.19
LIFESTYLE CHANGES	20	2.61	0.77	0.17
TOTAL	20	2.62	0.58	0.14

TABLE 8: DESCRIPTIVE STATISTICS:
PATIENT SELF-DISCLOSURE QUESTIONNAIRE: CLINICIAN FORM A
FINAL SAMPLE

CLINICIAN FORM A: SESSION 2

SCALE	N	MEAN ITEM SCORE	STANDARD DEVIATION	STANDARD ERROR
PERSONAL PROBLEMS AND FEELINGS	18	2.25	1.05	0.23
RESPONSES TO HEALTH CARE	18	2.10	0.67	0.15
LIFESTYLE CHANGES	18	2.28	0.92	0.21
TOTAL	18	1.90	0.83	0.20

CLINICIAN FORM A: SESSION 13

SCALE	N	MEAN ITEM SCORE	STANDARD DEVIATION	STANDARD ERROR
PERSONAL PROBLEMS AND FEELINGS	18	2.81	0.82	0.18
RESPONSES TO HEALTH CARE	18	3.10	0.77	0.17
LIFESTYLE CHANGES	18	2.72	0.83	0.18
TOTAL	18	2.94	0.65	0.16

**TABLE 9: DESCRIPTIVE STATISTICS:
PATIENT SELF-DISCLOSURE QUESTIONNAIRE: PARTICIPANT FORM D
FINAL SAMPLE**

PARTICIPANT FORM D: SESSION 2

SCALE	N	MEAN ITEM SCORE	STANDARD DEVIATION	STANDARD ERROR
PERSONAL PROBLEMS AND FEELINGS	20	2.25	1.05	0.23
RESPONSES TO HEALTH CARE	20	2.10	0.67	0.15
LIFESTYLE CHANGES	20	2.28	0.92	0.21
TOTAL	20	2.62	0.78	.19

PARTICIPANT FORM D: SESSION 13

SCALE	N	MEAN ITEM SCORE	STANDARD DEVIATION	STANDARD ERROR
PERSONAL PROBLEMS AND FEELINGS	20	2.81	0.82	0.18
RESPONSES TO HEALTH CARE	20	3.10	0.77	0.17
LIFESTYLE CHANGES	20	2.72	0.83	0.18
TOTAL	20	2.83	0.80	0.20

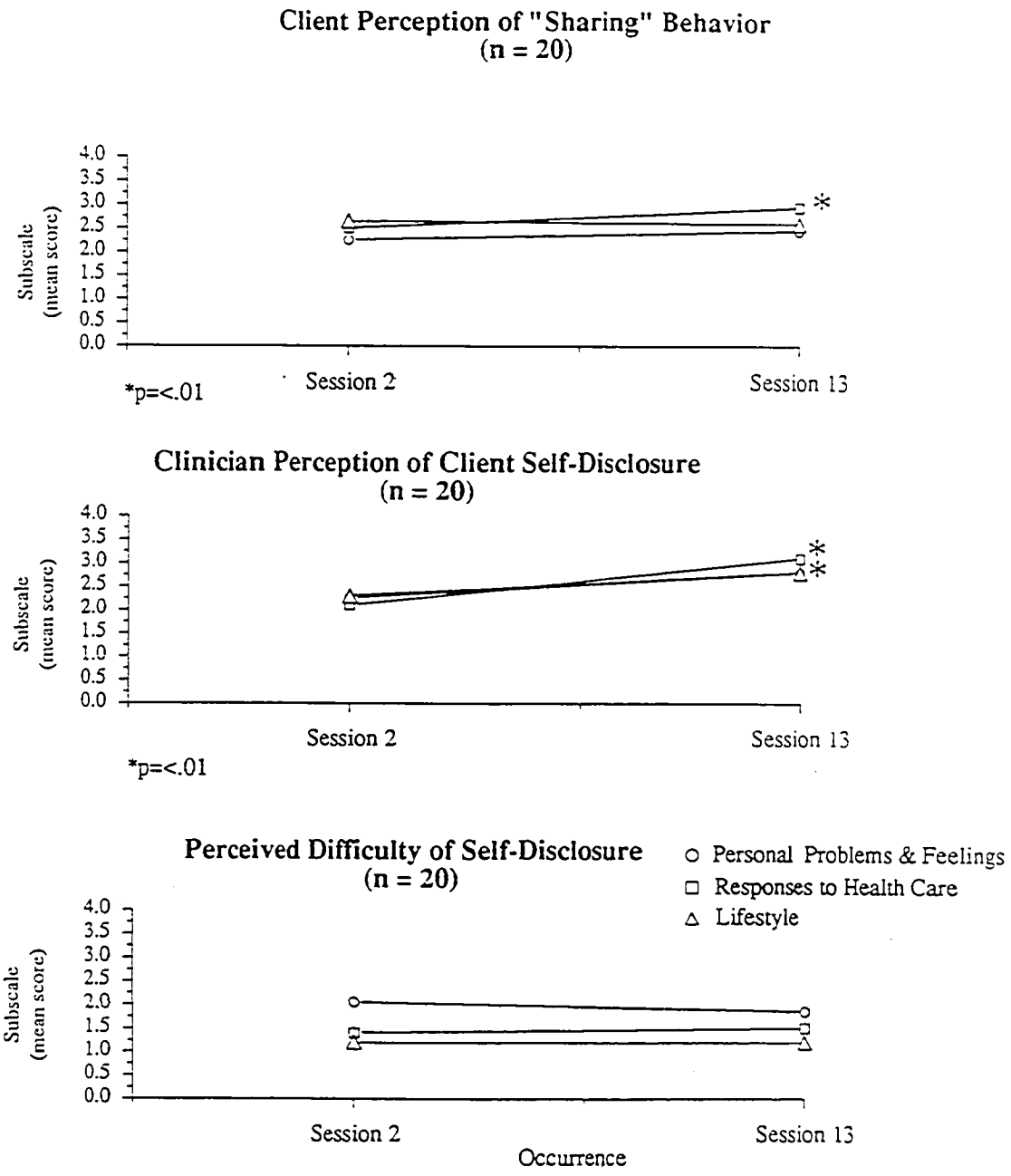


FIGURE 9: CHANGE IN SELF-REPORT BY SUBJECTS AND REPORT BY CLINICIANS OF SELF-DISCLOSURE AND PERCEIVED DIFFICULTY OF SELF-DISCLOSURE

HYPOTHESIS 2

There will be a correlation between client's perception of self-disclosure and the clinician's perception of the client's self-disclosure.

There was essentially no correlation between perceptions of the client (Participant Form A) and clinician (Clinician Form A) with regard to client self-disclosure, as indicated by visual analog scale scores, during session 2 ($r=.04$). However, by session 13 the correlation was significantly greater at $r=.44$ ($p=.05$). As a result of these findings Hypothesis 2 was rejected.

Hypothesis 2 addressed the issue of degree of correlation of perceptions of clinician and client with regard to self-disclosure on the part of clients during a training session. The concurrent assessments were an attempt to triangulate measurement of the phenomenon of subject self-disclosure. The differences in level of self-disclosure by subjects from the perspectives of client and clinician are noteworthy. Implications of these findings will be discussed in the following chapter.

HYPOTHESIS 3

There will be significant differences in levels of self-reported self-disclosure between men and women, it is predicted that women will report higher levels of self-disclosure, and less perceived difficulty of self-disclosure in the areas of personal problems and feelings, responses to health care, and changes in lifestyle.

The literature suggests that there are significant differences between men and women with regard to patterns of self-disclosure particularly in the dimension of intimacy of self-disclosure i.e. women report greater levels of intimate self-disclosure (Chelune, 1979). This hypothesis was tested using an analysis similar to that described for analyzing hypothesis 1. Mean subscale scores and mean scale total scores for each group were measured and t-tests were performed to test for significant differences between means. These data are presented in Table 10.

In support of Hypothesis 3 there were significant differences, with women reporting greater self-disclosure, at session 2 in the total scale score ($p=.05$). Specifically, there are significant differences between men and women in the dimension of Personal Problems and Feelings at session 2 with women reporting more self-disclosure than men. However, these differences were no longer significant at session 13. Figure 10 depicts male and female response patterns with regard to self-perception of "sharing" behavior. These findings support Hypothesis 3 at the first assessment point but not at the conclusion of the intervention.

TABLE 10: DESCRIPTIVE STATISTICS: PATIENT SELF-DISCLOSURE QUESTIONNAIRE: PARTICIPANT FORM A RESPONSE PATTERNS BY SEX

PARTICIPANT FORM A: SESSION 2

SCALE	SEX	MEAN ITEM SCORE	STANDARD DEVIATION	STANDARD ERROR
PERSONAL PROBLEMS AND FEELINGS	MALE (N=10)	1.64	0.71	0.23
	FEMALE (N=10)	2.84	0.74	0.23
RESPONSES TO HEALTH CARE	MALE (N=10)	2.37	0.56	0.18
	FEMALE (N=10)	2.60	0.79	0.25
LIFESTYLE CHANGES	MALE (N=10)	2.51	0.78	0.25
	FEMALE (N=10)	2.81	0.95	0.30
TOTAL	MALE (N=10)	1.85	0.56	0.21
	FEMALE (N=10)	2.45	0.59	0.18

PARTICIPANT FORM A: SESSION 13

SCALE	SEX	MEAN ITEM SCORE	STANDARD DEVIATION	STANDARD ERROR
PERSONAL PROBLEMS AND FEELINGS	MALE (N=10)	2.34	0.68	0.21
	FEMALE (N=10)	2.45	0.77	0.17
RESPONSES TO HEALTH CARE	MALE (N=10)	2.73	0.61	0.19
	FEMALE (N=10)	2.94	0.87	0.19
LIFESTYLE CHANGES	MALE (N=10)	2.64	0.98	0.31
	FEMALE (N=10)	2.61	0.77	0.17
TOTAL	MALE (N=10)	2.47	0.45	0.16
	FEMALE (N=10)	2.74	0.67	0.21

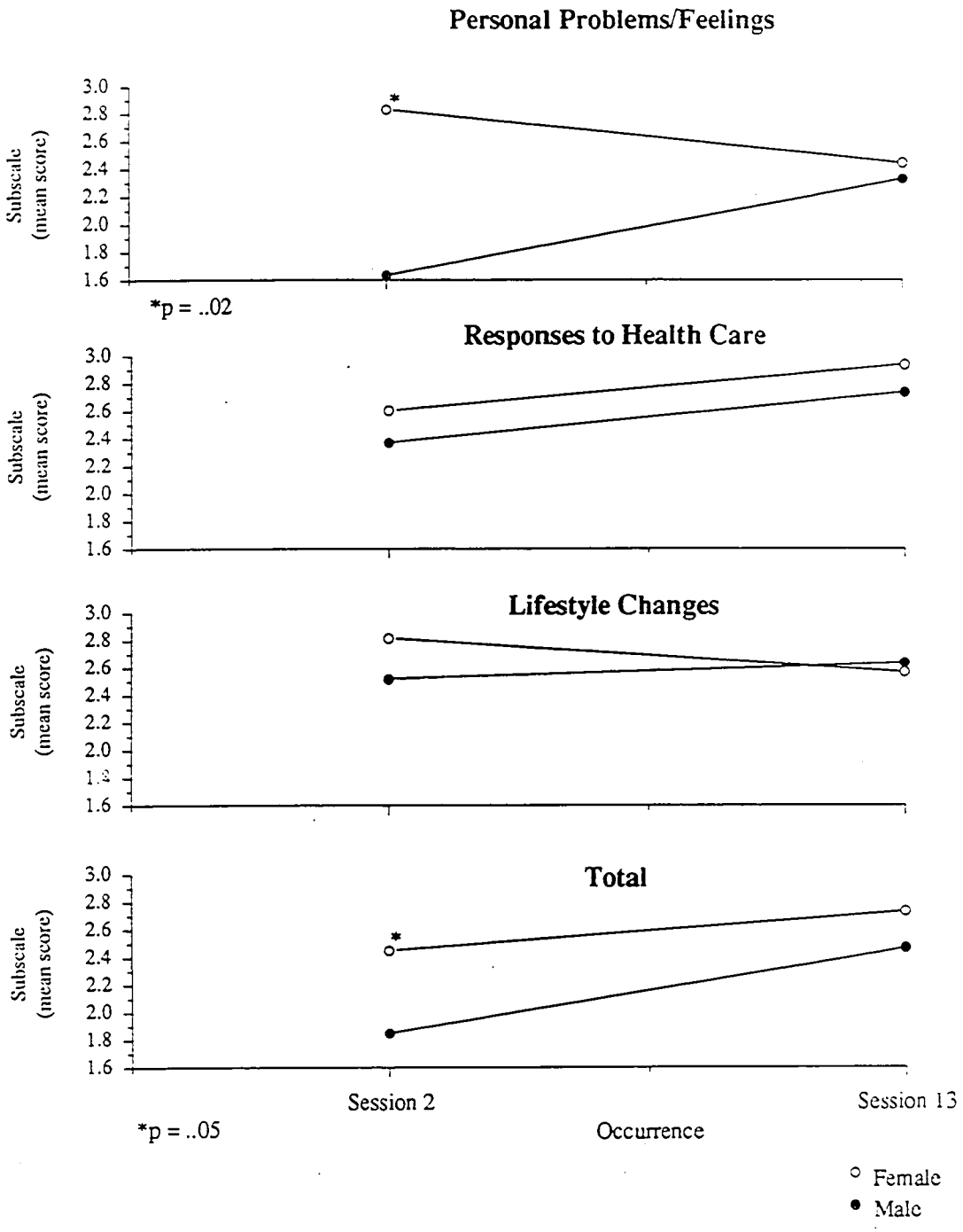


FIGURE 10: CLIENT PERCEPTION OF SHARING BEHAVIOR: RESPONSE PATTERNS OF MEN AND WOMEN

HYPOTHESIS 4

Following the intervention, there will be a positive correlation between change in self-reported self-disclosure, and change in indicators of hypertension, blood pressure, heart rate, cardiac output, and systemic vascular resistance at exit; i.e. the greater the self-disclosure during the intervention the greater the decrease in the psychophysiologic indicators.

This hypothesis was tested utilizing a measure of association, Pearson's Product Moment, between two variables:

1) Change in self-disclosure was assessed by subtracting the VAS score obtained for session 2 from the visual analog score for session 13. This method of obtaining the change score for self-disclosure is counter intuitive. However, this method was chosen because it was hypothesized that the amount of reported self-disclosure would be greater at session 13 than session 2. Therefore, to obtain a positive value, session 2 visual analog score was subtracted from the visual analog score obtained at session 13.

2) Change in the physiological variables was measured by subtracting the values obtained during session 13 from those measured during session 2. Systemic vascular resistance was a calculated variable. The formula utilized to calculate systemic vascular resistance was (Mean Arterial Pressure / cardiac output) X 80. Blood pressure determinations were of two types; 1) mean weekly and mean morning and evening systolic and diastolic self-monitored pressure calculated from daily logs maintained by the subject, and 2) blood pressure obtained during training sessions in the

laboratory by Dinamap (an automated blood pressure device).

During the laboratory assessment, which was performed at prescreening, screening, and exit from training, a series of two minute tasks were presented to the subject in random order. The tasks included an anagram task in which the subject was asked to unscramble words under time pressure, and a serial sevens math task similarly performed. Periods of rest occurred prior to and following each of the stressor tasks. Correlations were obtained of the variables of interest during each of five time points; the two simulated laboratory stressor tasks described above, rest 1, rest following anagram, and rest following math. The rest 1 time point is a measure physiological responses in a baseline resting state. The rest period following the anagram and the rest period following the math task are measures of recovery rate following exposure to a particular type of stressor stimulus.

Scatter plots of the significant results of these analyses are presented in Figures 11-13. There was a significant positive correlation between change in self-disclosure as indicated by the visual analog scale and change in systemic vascular resistance during four of the five time points assessed. The Figures 11 ($r = .56$) and 12 ($r = .52$) depict the correlation between change in systemic vascular resistance and change in the visual analog scale of the Patient Self-Disclosure Questionnaire (Participant Form A).

There was also a significant positive correlation between change in diastolic blood pressure during the laboratory assessment and change in self-disclosure (r= .65). These results are depicted in Figure 13. As predicted in Hypothesis 4, these analyses found that the greater the increase in self-disclosure during training, the greater the decrease in blood pressure indicators (systemic vascular resistance and diastolic blood pressure).

The analysis of the self-monitored blood pressure data, calculated from the mean levels obtained from the daily logs, produced similar results. There was a consistent, although non-significant (r= .36), trend in the correlation between change in self-disclosure VAS and change (in a downward direction) in weekly systolic blood pressure between screening and exit on daily logs (N=13).

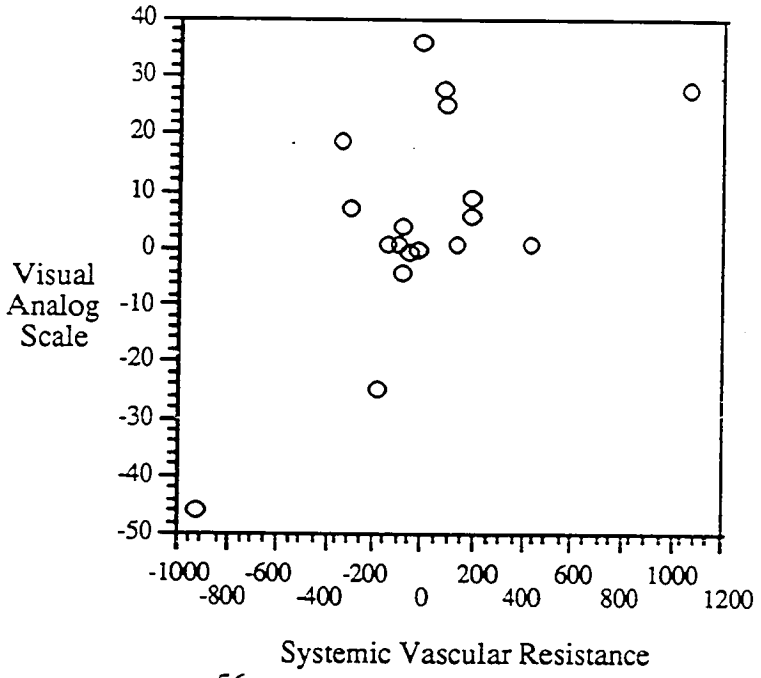


FIGURE 11: CHANGE IN SELF-DISCLOSURE VISUAL ANALOG SCALE AND CHANGE IN SYSTEMIC VASCULAR RESISTANCE DURING REST FOLLOWING ANAGRAM TASK (N=18)

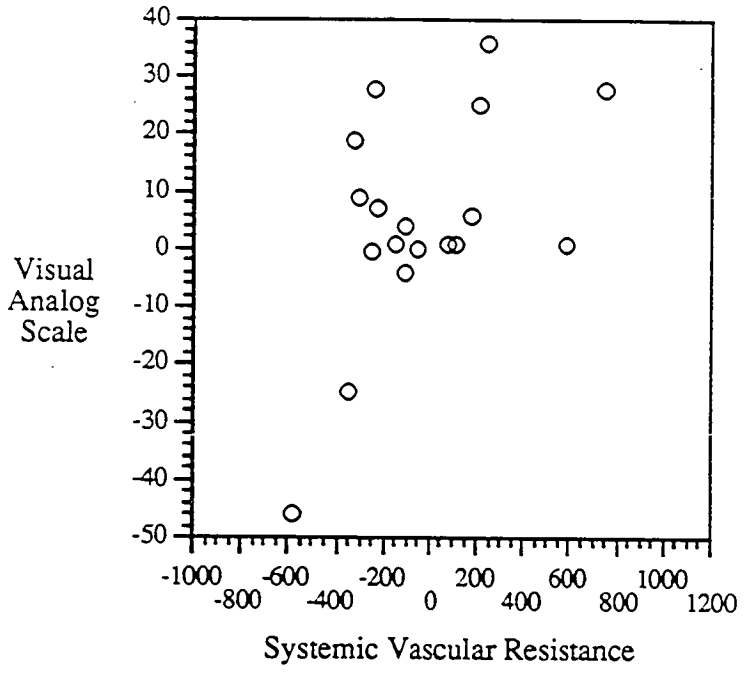
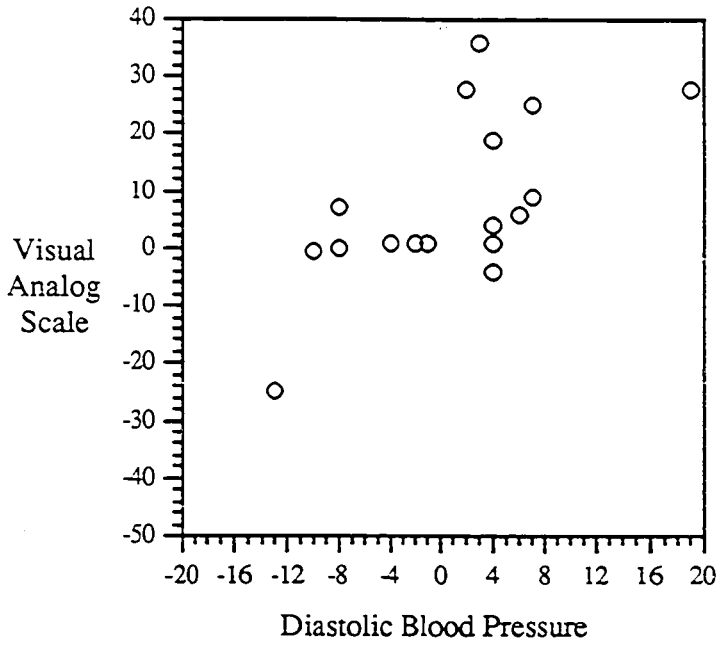


FIGURE 12: CHANGE IN SELF-DISCLOSURE VISUAL ANALOG SCALE AND CHANGE IN SYSTEMIC VASCULAR RESISTANCE DURING REST FOLLOWING MATH TASK FROM SESSION 2 TO SESSION 13 (N=18)



r = .65

p = .004

FIGURE 13: CHANGE IN SELF-DISCLOSURE VISUAL ANALOG SCALE AND CHANGE IN DIASTOLIC BLOOD PRESSURE DURING ANAGRAM TASK FROM SESSION 2 TO SESSION 13 (N=17)

HYPOTHESIS 5

There will be a positive correlation between change in self-disclosure by the client between session 2 and session 13, and change of scores on one or more of the indices of psychological distress including measures of depression, anxiety, hostility, anger, somatization, and cognitive disorganization; i.e. the greater the self-disclosure during the intervention the greater the decrease in the indices of psychological distress.

This hypothesis was tested in a similar manner to the procedure described to test the relationship between change in self-disclosure VAS and the psychophysiologic variables. The SCL-90 and the Symptoms of Stress Inventory (SOS) were measures of psychological distress, as previously described. The SCL-90 contains nine subscales and three measures of "global" distress. The SOS is composed of ten subscales. Assessments of client psychological distress were made at screening (corresponding to the session 2 administration of the Patient Self-Disclosure Questionnaire), and at exit (parallel to the session 13 administration of the measure of self-disclosure).

Change in self-disclosure was assessed by subtracting the VAS score obtained for session 2 from the visual analog score for session 13. It was hypothesized that the amount of reported self-disclosure would be greater at session 13 than session 2. The change scores in measures of psychological distress were determined by subtracting the score obtained at session 13 from the score obtained at session 2.

ANALYSIS OF THE SCL-90. The results of the correlation of the change in self-disclosure VAS and change scores on the SCL-90 are illustrated in Figures 14-16. Figures 14 and 15 depict the changes in self-disclosure VAS and the changes in the overall assessments of psychological distress (as measured by global scores of the SCL-90). The correlation of the self-disclosure VAS and the SCL-90 grand total was a nonsignificant negative correlation of r= -.25. However, the change in the number of items endorsed (positive symptom total) was significantly correlated in a negative direction (r= -.44 *p*=.05). Hence, these results suggest that increases in self-disclosure during biofeedback-assisted self-management training are associated with self-reported increases of global indices of psychological distress on the SCL-90.

TABLE 11: DESCRIPTIVE STATISTICS: MEASURES OF PSYCHOLOGICAL DISTRESS BEFORE AND AFTER BIOFEEDBACK-ASSISTED SELF-MANAGEMENT TRAINING

SYMPTOM CHECKLIST-90

SCL-90 SUBSCALE	OCCURRENCE	MEAN SCORE	STANDARD DEVIATION	STANDARD ERROR
GRAND TOTAL	SCREENING	48.6	46.80	10.46
	EXIT	32.4	25.29	5.65
POSTIVE SYMPTOM TOTAL	SCREENING	29.35	21.36	4.77
	EXIT	23.45	16.44	3.67
SOMATIZATION	SCREENING	0.50	0.60	0.13
	EXIT	0.32	0.35	0.08
INTERPERSONAL SENSITIVITY	SCREENING	0.64	0.62	0.13
	EXIT	0.38*	0.36	0.08
ANXIETY	SCREENING	0.58	0.69	0.15
	EXIT	0.31*	0.33	0.07
HOSTILITY	SCREENING	0.63	0.61	0.13
	EXIT	0.37**	0.44	0.09
DEPRESSION	SCREENING	0.61	0.59	0.13
	EXIT	0.46	0.40	0.09

* p= .05

** p= .01

TABLE 12: DESCRIPTIVE STATISTICS: MEASURES OF PSYCHOLOGICAL DISTRESS BEFORE AND AFTER BIOFEEDBACK-ASSISTED SELF-MANAGEMENT TRAINING

SYMPTOMS OF STRESS

SOS SUBSCALE	OCCURRENCE	MEAN SCORE	STANDARD DEVIATION	STANDARD ERROR
TOTAL	SCREENING	74.40	52.43	11.72
	EXIT	58.55	42.82	9.57
NEUROLOGICAL	SCREENING	0.28	0.43	0.09
	EXIT	0.27	0.50	0.11
GASTRO-INTESTINAL DISTRESS	SCREENING	0.62	0.73	0.16
	EXIT	0.44	0.51	0.11
COGNITIVE DISORGANIZATION	SCREENING	0.73	0.70	0.15
	EXIT	0.38**	0.42	0.08
ANXIETY	SCREENING	0.73	0.62	0.14
	EXIT	0.43**	0.42	0.09
ANGER	SCREENING	1.08	1.06	0.23
	EXIT	0.72*	0.67	0.15
DEPRESSION	SCREENING	0.67	0.60	0.13
	EXIT	0.39**	0.43	0.09

* p= .01

** p= .001

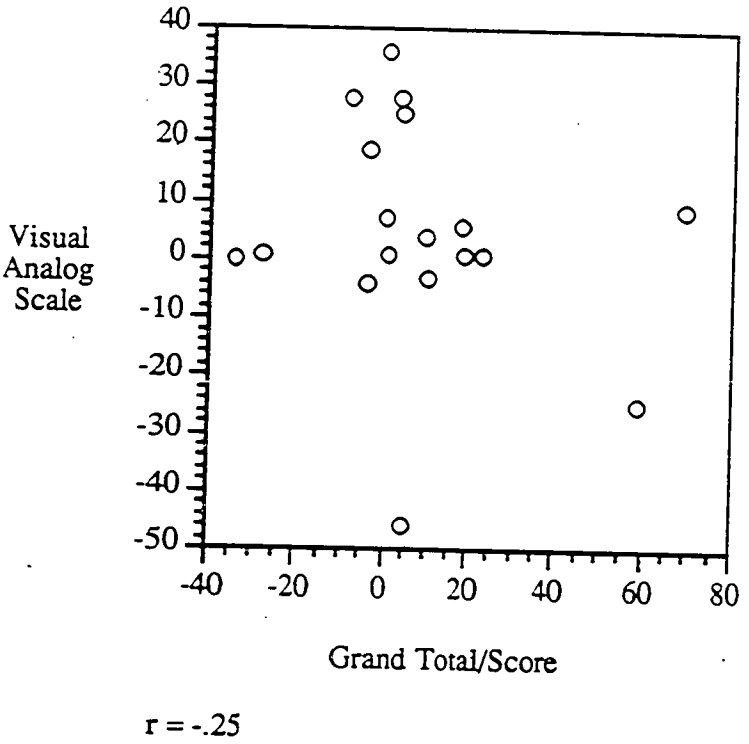
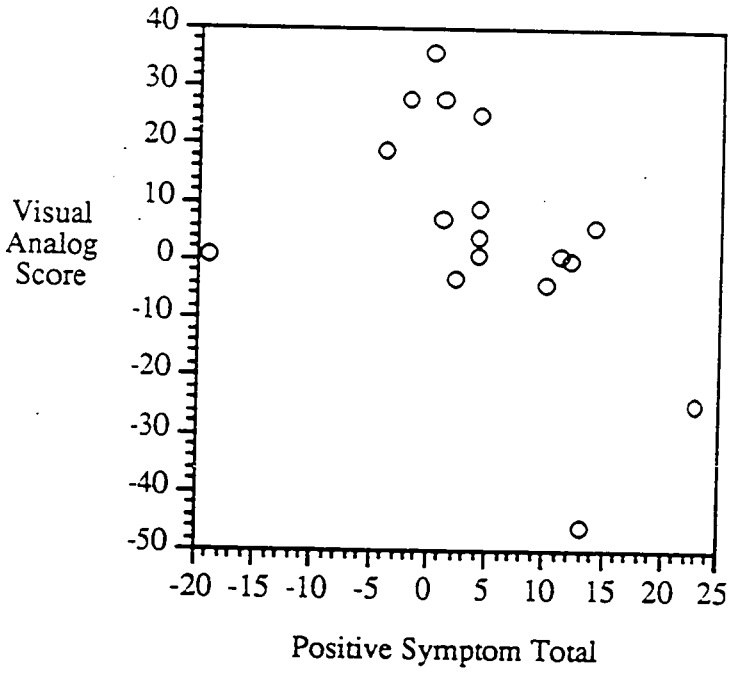


FIGURE 14: CORRELATION BETWEEN CHANGE IN SELF-DISCLOSURE AND CHANGE IN A GLOBAL INDEX OF PSYCHOLOGICAL DISTRESS DURING BIOFEEDBACK-ASSISTED SELF-MANAGEMENT TRAINING (N=18)



p = .05 (two-tailed)

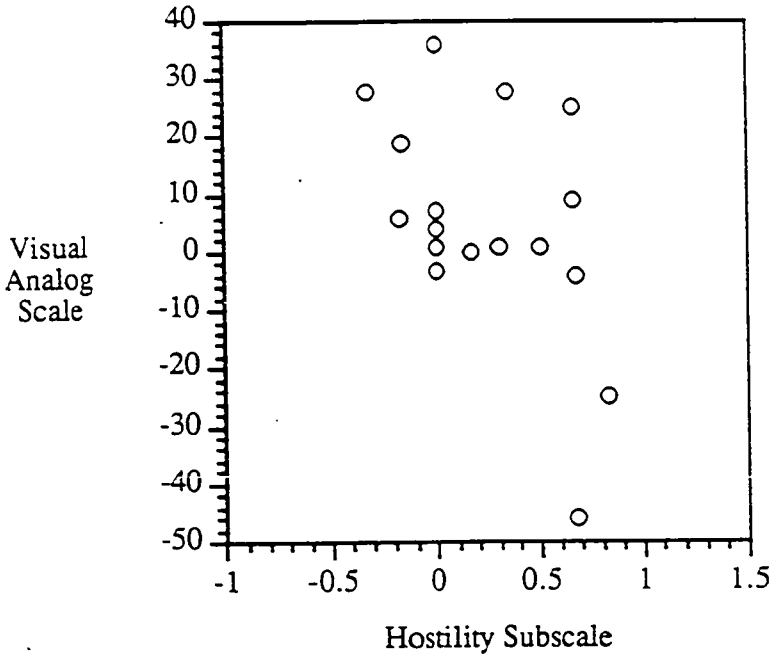
r = -.44

FIGURE 15: CORRELATION BETWEEN CHANGE IN SELF-DISCLOSURE AND CHANGE IN NUMBER OF ITEMS OF PSYCHOLOGICAL DISTRESS ENDORSED DURING BIOFEEDBACK-ASSISTED SELF-MANAGEMENT TRAINING (N=18)

The SCL-90-R subscales of somatization, depression, and hostility, were of particular interest as measures of stress-related psychological distress. The results of these analyses are here depicted in Figure 16. Scatterplots of nonsignificant results are contained in the appendices. The correlation of change in VAS and change in subscale somatization from screening to exit was nonsignificant (r= -.22) see Appendix . Given a larger sample this correlation would undoubtedly have been significant.

The correlation of change in the visual analog scale and the depression subscale was r= -.32 in this sample (see Appendix). The correlation of change in self-disclosure and change in the dimension of hostility is r= -.44 p=.05 two-tailed (see Figure 16). Similarly, the change in the anxiety subscale was correlated with the analog score (r= -.28) see Appendix .

These data results found a significant relationship between increase in self-disclosure during biofeedback-assisted self-management training and increase in dimensions of psychological distress measured by the SCL-90, specifically hostility. Also, a healthy relationship was found between increase in self-disclosure and increase in symptomotologies associated with depression and somatization.

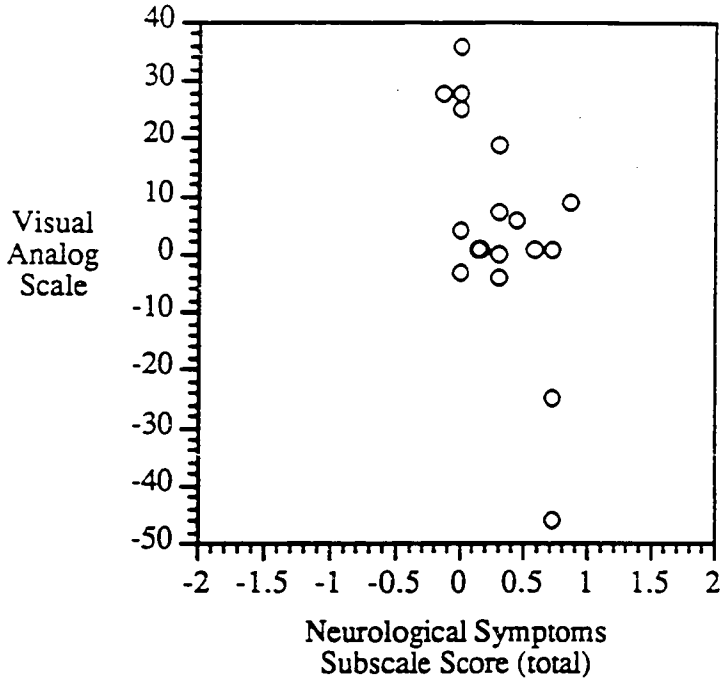


r = -.44

FIGURE 16: CORRELATION BETWEEN CHANGE IN SELF-DISCLOSURE AND CHANGE IN HOSTILITY DURING BIOFEEDBACK-ASSISTED SELF-MANAGEMENT TRAINING (N=18)

Analysis of the SOS. In addition to the SCL-90, psychological distress was also measured by the Symptoms of Stress Inventory. The data from the ten subscales of the Symptoms of Stress was analyzed, as described in the previous chapter, by calculating change scores obtained by subtracting the screening scores from exit scores.

Three of the subscales correlated substantially with change scores in self-disclosure VAS: neurological symptoms, gastrointestinal symptoms, and cognitive disorganization. The results of the analysis of the correlation between the change in the self-disclosure visual analog scale score and change in the subscales of the Symptoms of Stress Inventory are presented in Figures 17-19. Figure 17 depicts the relationship between the change in VAS from session 2 to session 13 and change in the neurological symptoms subscale. The correlation was r= .51 *p*=.03 (two-tailed). These data support Hypothesis 5 i.e. increase in self-disclosure during training was associated with a decrease in self-reported neurological symptoms.



p = .03 (two-tailed)
r = .51

FIGURE 17: CORRELATION OF CHANGE IN SELF-DISCLOSURE AND CHANGE IN NEUROLOGICAL SYMPTOMS DURING BIOFEEDBACK-ASSISTED SELF-MANAGEMENT TRAINING (N=18)

The relationship between the VAS change score and the change score in the subscale gastrointestinal symptoms is illustrated in Figure 18 (r= -.33 *p*=.08). This is a nonsignificant trend in a negative direction. However, the correlation of these variables would be significant with a larger sample size. Restated, these data found that as self-disclosure increased, during the intervention, symptoms of gastrointestinal distress also increased.

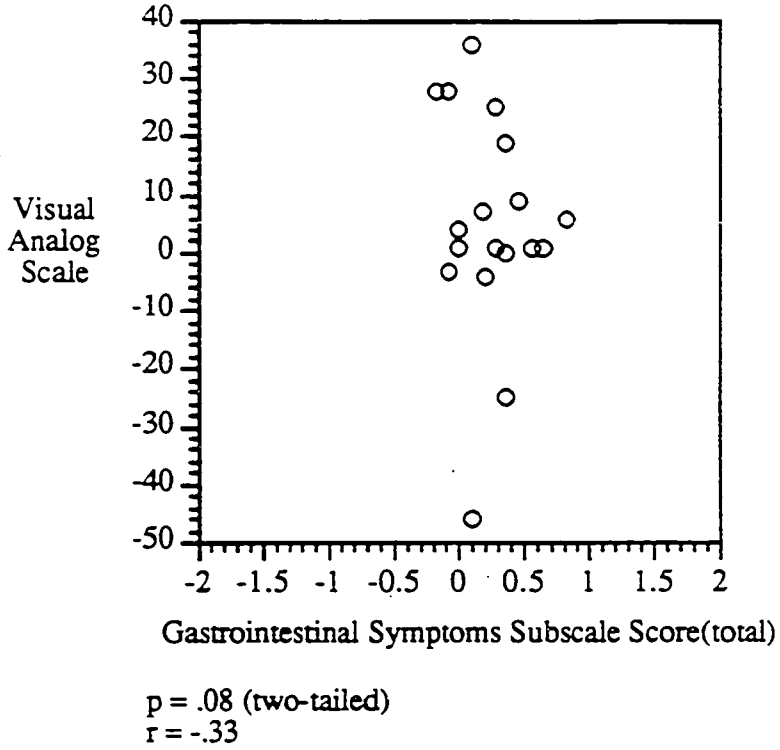
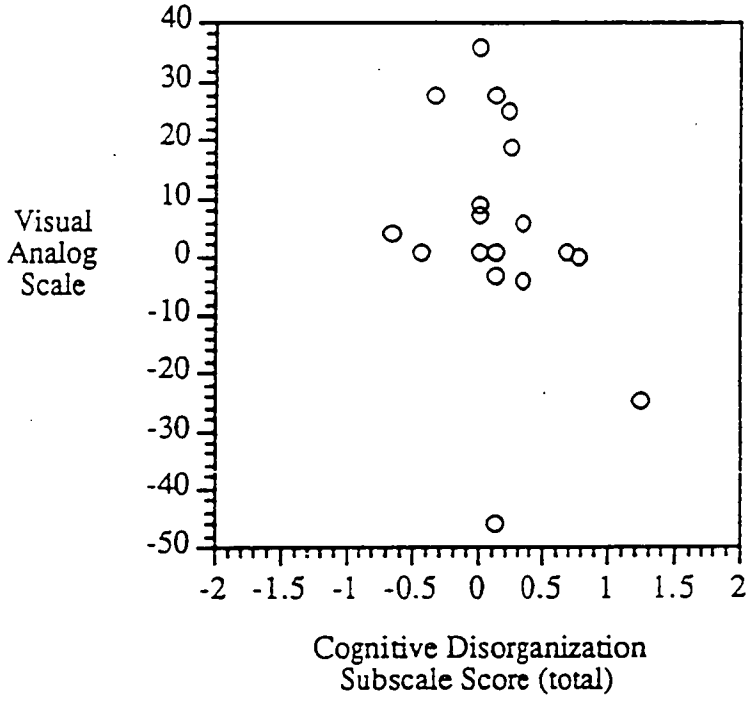


FIGURE 18: CORRELATION OF CHANGE IN SELF-DISCLOSURE AND CHANGE IN GASTROINTESTINAL SYMPTOMS DURING BIOFEEDBACK-ASSISTED SELF-MANAGEMENT TRAINING (N=18)

Figure 19 is a scatter plot depicting the relationship between change in the visual analog score on the Patient Self-Disclosure Questionnaire and change in the cognitive disorganization subscale of the SOS. This is a particularly robust correlation: r= -.61 *p*=.007 (two-tailed).

In summary, two instruments were utilized to test Hypothesis 5 i.e. increases in self-disclosure during biofeedback-assisted self-management training associated with change in indices of psychological distress. Analysis of SCL-90 data found that increased self-report of self-disclosure was associated with increase in global indices of psychological distress. Specifically, increased self-disclosure was particularly associated with increased distress in the dimensions of somatization, depression, and hostility.

The Symptoms of Stress Inventory data analyses were somewhat conflicting. Specifically, there was a relationship between increased self-disclosure and decreased self-report of distress in the dimension of neurological symptoms. However, in the dimensions of anxiety, gastrointestinal symptoms, and cognitive disorganization there was a negative correlation between change in self-disclosure and stress-related distress. That is, as self-disclosure increased symptoms of anxiety, gastrointestinal distress, and cognitive disorganization also increased.



p = .007 (two-tailed)

r=-.61*

FIGURE 19: CORRELATION OF CHANGE IN SELF-DISCLOSURE AND CHANGE IN COGNITIVE DISORGANIZATION DURING BIOFEEDBACK-ASSISTED SELF-MANAGEMENT TRAINING (N=18)

HYPOTHESIS 6

There will be a positive correlation between change in self-report of self-disclosure in subjects receiving biofeedback/self-management training; and client perception of one or more of therapist attributes of empathic understanding, unconditionality of regard, level of regard, and congruence; i.e. the greater the self-disclosure during the intervention the stronger the perception by the client regarding favorable therapist attributes.

Hypothesis six postulated a relationship between the clients' perceptions of therapist attributes and amount and type of subject self-disclosure. Specifically, a relationship between change in self-disclosure and subject's perception of the therapist attributes of level of regard, empathy, congruence, and unconditionality of regard was hypothesized.

The instrument used to measure subject perception of the relational and caring characteristics of the therapist was the Barrett-Lennard Relationship Inventory (Barrett-Lennard, 1962). It was anticipated that the client's perception of the therapist-client relationship would significantly alter the amount and type of self-disclosure. As a result of low reliability assessments of tool subscales, reported earlier, only the the total scale score was used in this analysis.

This hypothesis was not supported by the data in this small sample of hypertensive clients. The correlation between measures of self-disclosure and the total scale of the Barrett-Lennard Relationship Inventory failed to approach significance ($r = .15$). Thus, hypothesis 6 was rejected.

CHAPTER FIVE

DISCUSSION, SUMMARY, AND RECOMMENDATIONS

The purpose of this investigation, restated from the introductory remarks, was to examine self-disclosure as a variable that heightens the value of biofeedback, reduces psychophysiologic arousal, and influences perceptions of the therapeutic relationship between nurse and client. The study was a quasiexperimental, longitudinal, and correlational design to investigate dimensions of self-disclosure within the context of biofeedback-assisted self-management training. This chapter includes discussion, summary, and recommendations based on the results of the study. To aid in clarity of presentation, this chapter is subdivided into the following sections; discussion of the findings, conceptual and methodological issues, summary, limitations of the study, implications for practice, and recommendations for future investigations.

DISCUSSION OF FINDINGS

In this section of the chapter the results of hypothesis testing and implications associated with those results are discussed. Overall, increased self-disclosure during biofeedback-assisted self-management training was associated with decrease in cardiovascular indicators of hypertension and increased self-report in several dimensions

of psychological distress. Specific aims and associated results of hypothesis testing are reviewed and implications of the outcomes explored.

SELF-DISCLOSURE IN BIOFEEDBACK

The findings of this study were supportive of the primary aim of this investigation addressed in hypothesis 1. The amount of self-reported self-disclosure by subjects increased following biofeedback-assisted self-management training. There were significant increases in amount of client self-disclosure reported by clients and the clinicians. This finding is consistent with the social penetration model that interpersonal relationships tend to increase in amount and depth of self-disclosure gradually over time (Altman and Taylor, 1971).

The present investigation, using the biofeedback context as a specific therapeutic condition, examined change in self-disclosure in relationship to other therapeutic outcomes. Whether biofeedback per se alters level and depth of self-disclosure could not be tested with the design used in this investigation. Also, how the pattern of self-disclosure in a therapeutic context, which is by nature unidirectional, differs from a more bidirectional relationship could not addressed here.

Although there were significant increases in self-disclosing behavior as reported by both client and clinician;

perceived difficulty of self-disclosure did not change during the course of the intervention. Due to the small sample size, caution is indicated in interpreting these results. However, these findings suggest that perceived difficulty of self-disclosure is a trait-like attitude and resistant to change.

Hypothesis 2 addressed the issue of correlation of perceptions of clinician and client with regard to self-disclosure on the part of clients during a training session. The concurrent assessments by both client and clinician, in addition to the measure of perceived difficulty of self-disclosure, were an attempt to triangulate measurement of the phenomenon of client self-disclosure. There were mixed results in this sample with regard to Hypothesis 2.

It is interesting to note the differences in perceived level of self-disclosure by subjects from the perspectives of client and clinician. There were significant differences in mean levels of perceptions of subject and clinician at session 2 in total scale scores. This finding demonstrates that perception of self-disclosing behavior is subjective and variable both within and across individuals. However, it is also noteworthy that there was greater congruence in perceptions of client and clinician toward the end of the intervention. This finding supports the notion of convergence in perception over time in a therapeutic relationship (Abramowitz, Berger, Weary, 1982; Beutler, 1981).

SEX DIFFERENCES IN PATTERNS OF SELF-DISCLOSURE

To test Hypothesis 3 differences between the ten men and ten women in this sample in perceived amount of self-disclosure were examined. This analysis found significant differences between sexes at session 2 in the dimension of Personal Problems and Feelings, with women reporting more self-disclosure. These differences were no longer present at session 13. Previous investigators examining self-disclosing behavior of men and women have concluded that there are significant differences in the level and breadth of intimacy of disclosure between the sexes (Jourard, 1971; Dimond and Munz, 1967; Pederson and Breglio, 1968). The present investigation is one of few known longitudinal studies of self-disclosing behavior. A longitudinal investigation permits the investigator to study patterns of behavior over the course of time. Long-term effects have been found to be both qualitatively and quantitatively different from those obtained in a single occurrence design (Campbell and Stanley, 1966). The findings of the present investigation, support the validity of this statement. Examination of patterns in time suggests that, while there are differences between men and women in self-disclosing behavior initially in a relationship, they diminish over time. The men increased in the amount of self-disclosing behavior in the dimension of Personal Problems and Feelings between session 2 and session 13. The women actually decreased slightly in amount of intimate self-disclosure between session 2 and session 13.

The interaction of female therapists with female and male clients is a confounding factor in this investigation. All three clinicians in this study were women. There is a need to examine the interaction effects of clinician/client sex on patterns of client self-disclosure. Earlier studies suggest that there are interaction effects between sex of therapist or other health care provider and client self-disclosure. Young (1979) found that patient disclosure to a physician was enhanced when the physician was more attractive, when the patient was disclosing general, as compared to more personal or mental illness symptoms; male patients were more willing to disclose than female patients, and disclosure by patients was enhanced in same sex dyads.

SELF-DISCLOSURE AND PSYCHOPHYSIOLOGIC INDICATORS OF HYPERTENSION

In this investigation, Hypothesis 4 examined the association between change in self-disclosure and several psychophysiological indicators related to hyperension. Statistical analysis demonstrated an association, support of hypothesis 4, between the change in systemic vascular resistance and diastolic blood pressure and increased self-report of self-disclosure. That is, as self-disclosure increased systemic vascular resistance and laboratory measures of diastolic blood pressure decreased. In addition, a corollary was found between increase in self-disclosure and

decrease in self-monitored systolic blood pressure. Specifically, the analysis of self-monitored blood pressure demonstrated a trend (although non-significant with this small sample) of decrease in morning mean diastolic blood pressure and weekly mean systolic blood pressure (r=.36 N=13) with increased change in self-disclosure. These findings are consistent with results obtained by previous investigators (Pennebaker, J.W., & Beall, S.K., 1986; Pennebaker, Hughes, C.F., O'Heeron, R.C., 1987).

Pennebaker (1986; 1987; 1989) found that for high self-disclosers; (those individuals who increased in amount of self-disclose pre to post) disclosure of trauma by writing resulted in significant decrease in systolic and diastolic blood pressure. This investigation found a positive relationship between change in diastolic blood pressure and change in self-disclosure at one time point in the laboratory. Those individuals who were "high self-disclosers" decreased in diastolic pressure during the laboratory stressor of solving anagrams. There was no significant relationship between change in self-disclosure and blood pressure at other time points in the psychophysiologic assessment.

The laboratory assessment also demonstrated a relationship between change in self-disclosure and change in systemic vascular resistance. Systemic vascular resistance is a calculated variable (mean arterial pressure/cardiac output) X 80. As subjects increased in amount of self-disclosure from

session 2 to session 13, they decreased in systemic vascular resistance as measured during four of five tasks of the laboratory psychophysiologic assessment. This measure is an indicator of vascular resistance to blood flow in the periphery and is conceptually related to diastolic blood pressure. Interpretation of this finding is difficult. The factors in this equation are physiological parameters gathered during the psychophysiologic assessment. Significant correlations occurred between change in self-disclosure and calculated SVR during both rest following specific simulated stressors and stressor stimuli themselves. Since the variablity in systemic vascular resistance is probably adrenergically driven, this finding may suggest decreased levels of long-term physiological arousal in high self-disclosers. The implication of these findings is that changes in self-disclosure affects the neurogenic control of hypertension and therefore impacts longterm cardiovascular variables.

SELF-DISCLOSURE AND PSYCHOLOGICAL DISTRESS

Hypothesis five predicted a relationship between the psychological distress outcome variables and change in self-disclosure. As predicted, the data analysis demonstrated that as self-disclosure increased between session 2 and session 13 there was an increase in self-report of measures of psychological distress and symptoms of stress in the

dimensions of total score, number of symptoms endorsed, cognitive disorganization, hostility, and depression.

To better understand this phenomenon, it is useful to reexamine the characteristics of a therapeutic relationship. Disclosure in a therapeutic relationship has a distinct pattern and rate which differs from the natural relationship. These results support the assumption that self-disclosure is both an intrapersonal and an interpersonal process. It is a means by which an individual becomes "known to others, achieves self-congruence, and acquires positive feelings of self-worth" (Doster and Nesbitt, 1979, p.178).

One of the primary assumptions associated with the construct of self-disclosure concerns its relation to mental health. Jourard argues that the ability to allow one's real self to be known is an indicator of mental health (Jourard, 1971, Raphael & Dohrenwend, 1987). Recent research suggests that this relationship is curvilinear (Jourard, 1964; Chaiken & Derlega, 1974; Cozby, 1973; Strassberg, Roback, D'Antonio & Gabel, 1977; Blotcky, Carscaddon & Grandmaison, 1983). The rate and level of intimacy extremes of self-disclosure, particularly in a therapy setting, have been associated with a less healthy personality.

These study results suggest that the intrapersonal changes associated with self-disclosure in biofeedback-assisted self-management training are significant. Intimated in these findings is subject reactivity to heightened self-

disclosure. Self-disclosure contains a distinct element of risk. To become psychologically vulnerable can be frightening. This element of apprehension and distress is probably heightened in a therapeutic intervention. The role of self-disclosure in a therapeutic context has been discussed by major theorists such as Jourard (1971), and Rogers (1961) as a reflection of the uncensored flow of individual experience. Early theorists emphasize interpersonal aspects and the concept of self-disclosure as a trait-like phenomenon. Until recently, little attention had been given to the intrapersonal process, particularly psychophysiological impact, self-disclosure engenders in the patient.

Many of the earlier investigations of self-disclosure in the context of a therapeutic intervention have not examined the phenomenon with a longitudinal research design. Issues related to changes over time in the relationship between self-disclosure and dimensions of psychological distress have not been examined. The results of this investigation suggest that increased self-disclosure within the context of biofeedback-assisted self-management training is associated with a therapeutic change process. A change process, by definition, is composed of stages which are bound by time and individual experience. The delineation of stages in a process requires a longitudinal or repeated measures design.

The findings of this investigation suggest that the

stages of a therapeutic change process include a phase of increased self-report of symptoms of distress. Schwartz has theorized that any effective therapeutic process includes a phase of disorganization prior to reorganization at another level (Schwartz, 1990). This phase of disorganization is characterized by increased disturbance psychologically in a patient. This may be manifested by anxiety, depression, anger or hostility, and cognitive disorganization.

Recent biobehavioral researchers of hypertension postulate that hypertension is a repressive disease in a significant subgroup of the population (Jamner, 1991; Schwartz, 1990). Repression, for the purposes of this investigation, is defined as a discrepancy between cognitive perceptions and psychophysiological responses (Weinberger, 1986). Individuals who are "repressive" believe that they are not distressed despite evidence which contradicts that belief. This self-deception implies that repressors are 1) motivated to maintain self-perceptions that they have a low rate of negative emotional reactions despite 2) a tendency to respond physiologically and behaviorally in a manner indicative of high levels of perceived threat (Weinberger, 1986; Jamner, 1991; Schwartz, 1987; 1990).

In his regulation versus disregulation model Schwartz (1990) proposes that connection leads to self-regulation. In the impaired connection condition, self-regulation is impeded. This disordered state is hypothesized

to contribute to physical, mental and social diseases. The progression over time occurs as follows: disattention to disconnection to disregulation to disorder to disease (Schwartz, 1977; Schwartz, 1990). When applied to the construct of repression; denial or repression of emotional reactions disconnects the individual from vital regulatory information.

In conclusion, Hypothesis 5 was accepted based on the results of data obtained from this small sample. Nakagawa-Kogan and colleagues report that 53% of the subjects (N=60) participating in their investigation were defined by psychometric responses as "repressive" (Nakagawa-Kogan, 1991). The subjects of this investigation were a subsample of the larger sample from the Nakagawa-Kogan study. Of the individuals falling into the repressive category over 50% were men. From the results of this study, we could speculate that the exposure to the intervention of biofeedback-assisted self-management training may have altered the repressed coping style of some of the male subjects. If so, then the outcome was increased self-report of several dimensions of symptoms of stress and psychological distress.

THE THERAPEUTIC RELATIONSHIP

Hypothesis six postulated an association between the subject's perception of therapist attributes and amount and type of subject self-disclosure. This hypothesis was not

supported by the data. No significant relationship was demonstrated between change in self-disclosure and subject's perception of the therapist attributes of level of regard, empathy, congruence, and unconditionality of regard.

These findings are inconsistent with conclusions of other investigators (Truax, Altman, & Wittmer, 1973). Their study concluded that traits of the object of self-disclosure may impact patterns of self-disclosure. Young (1980) found that willingness to disclose was enhanced by perceived physician social and technical competence.

One possible explanation for this inconsistency in results may be methodological. Reliability assessments of the Barrett-Lennard Relationship Inventory demonstrated very low internal consistency ratings of the four subscales of the tool. As a result, only total scale scores were analyzed. These findings imply that the instrument was a relatively unreliable measure in this sample of the hypertensive population. Barrett-Lennard, (1986) reported extensive acceptable reliability assessments of various versions of the tool in multiple psychiatric populations. Those results may not be generalizable to a hypertensive sample.

It was noted, during the course of this investigation, that inadvertently one subject was given the tool assessing the subjects perception of therapist attributes, The Barrett-Lennard Relationship Inventory, twice during week seven and week eight of the intervention.

Analysis of her scores revealed a marked discrepancy in her assessments of therapist attributes from week seven to week eight. This finding suggests that subject perception of therapist attributes and the therapeutic relationship may possibly be highly variable and labile over time. It also suggests the presence of a process. The low internal consistency values for the subscales, obtained from this sample, may be due to interpersonal varibility in the therapeutic process.

SELF-DISCLOSURE: CONCEPTUAL AND OPERATIONAL ISSUES

A review of the literature and examination of existing instruments indicated that self-disclosure is a difficult construct to study. Methods of measuring self-disclosing behavior other than with discourse analysis are rare and lack generalizability to the population of interest. The literature demonstrated that self-disclosure is presently recognized as a multi-dimensional construct (Chelune, 1979). Most of the tools frequently used to measure self-disclosure were developed from the JSDQ and are unidimensional. Instruments that measure multiple dimensions of self-disclosing behavior are rare.

Therefore, an existing tool, The Patient Self-Disclosure Questionnaire (Dawson, 1985), was adapted for use in this study. The original instrument was designed to measure attitudes of patients regarding self-disclosure to a

health care provider. It attempted to address two of the five dimensions described by Chelune, 1979, variability in level of intimacy, and amount of self-disclosure. In addition, Dawson designed her instrument to measure the attitudes of perceived importance and perceived difficulty of self-disclosure by patients toward a health care provider.

For the purposes of this investigation, The Patient Self-Disclosure Questionnaire was adapted to measure self-report of disclosing behavior in addition to perceived difficulty of self-disclosure. The scale measuring perceived importance of self-disclosure was not used. The author, in a personal communication, indicated that she had found that the perceived importance scale was confounded by social desirability responding patterns (Dawson, 1990).

Dawson stated, after studying patterns of perceived difficulty and perceived importance of self-disclosure among different patient populations to a health care provider, it was her conclusion that self-disclosure was trait-like and therefore resistant to change. The results of this investigation contradict the assumption that self-disclosing behavior is trait-like. Although perceived difficulty of self-disclosure was unchanged throughout the intervention; self-report of the behavior did significantly increase from session 2 to session 13.

The instrument, with its subscale dimensions, corresponded to the multiconceptual thrust of the

intervention: biofeedback-assisted self-management training. The level or breadth of intimacy of self-disclosure was tapped by the subscale Personal Problems and Feelings. This corresponded to the cognitive/affective component of the intervention. The Responses to Health Care subscale was a measure of self-disclosure by subjects to their clinician regarding responses to the intervention and the therapeutic relationship. The Changes in Lifestyle subscale tapped responses to the psychoeducational and behavioral change component of the intervention.

SUMMARY OF RESULTS

The outcomes of this study are summarized as follows:

1. *Biofeedback-assisted self-management training alters self-report of self-disclosure by subjects.* There were significant increases in self-disclosing behavior by subjects as reported by both client and clinician; perceived difficulty of self-disclosure did not change during the course of the intervention.

2. *There were significant differences between client and clinician in perception of client self-disclosure during the initial phases of the intervention.* This finding demonstrates that perception of self-disclosing behavior is subjective and variable both within and across individuals. There were no significant differences toward the end of the intervention. This finding supports the notion of convergence and increase

of similarity in perception over time in a therapeutic relationship.

3. *This study found significant differences between sexes in self-disclosure at session 2 with women reporting more self-disclosure.* These differences were no longer present at session 13. These findings are contrary to the conclusions of previous investigators. The present investigation is one of the few longitudinal studies of self-disclosing behavior. In this study there were are differences between men and women in self-disclosing behavior initially, but they diminished over time. The men increased in the amount of self-disclosing behavior. The women actually decreased slightly in amount of self-disclosure between session 2 and session 13.

4. *This investigation found that increased self-disclosure was associated with a decrease in psychophysiological indicators of hypertension.* This investigation examined the association between change in self-disclosure and several psychophysiological variables. Data analysis demonstrated an association between decrease in systemic vascular resistance, and laboratory measures of diastolic blood pressure and increase in self-report of self-disclosure. In addition, a corollary was found between increase in self-disclosure and decrease in self-monitored diastolic blood pressure. These findings are consistent with results obtained by previous investigators.

5. *This investigation found that increase in self-report of*

self-disclosure was associated with an increase in measures of psychological distress and symptoms of stress. These study results suggest that the intrapersonal changes associated with self-disclosure in a biofeedback-assisted self-management training are significant. An important issue to consider is subject reactivity to heightened self-disclosure. The results of this investigation suggest that increased self-disclosure within the context of biofeedback-assisted self-management training is associated with a therapeutic change process. The stages of the therapeutic change process may include a phase of increased self-report of symptoms of distress. An effective therapeutic process probably involves the intrapersonal experience of psychic disorganization prior to reorganization. This phase of disorganization is characterized by increased disturbance. This may be manifested by increased anxiety, depression, anger or hostility, and cognitive disorganization.

6. *Findings of this investigation suggest that biofeedback-assisted self-management training may alter a repressed coping style in some male subjects.* The outcome was increased self-report of symptoms of stress and indicators of psychological distress. Over fifty percent of the subjects in the Nakagawa-Kogan et al investigation were defined by psychometric responses as "repressive" (Nakagawa-Kogan, 1991). Of the individuals falling into the repressive category over 50% were men. The subjects of this investigation were a subsample of

the larger sample from the Nakagawa-Kogan study.

7. *No significant relationship was demonstrated between change in self-disclosure and subject's perception of the therapist attributes of level of regard, empathy, congruence, and unconditionality of regard.* These findings may represent a methodological weakness of this small sample investigation. These findings imply that the instrument was a relatively unreliable measure in this sample.

8. *The adapted Patient Self-Disclosure Questionnaire was found to be a reliable and valid method to measure self-report of self-disclosure by patients to a health care provider.* The instrument, with its subscale dimensions, corresponded well to the multiconceptual intervention; biofeedback-assisted self-management training. The subscale Personal Problems and Feelings corresponded to the cognitive/affective component of the intervention. The Responses to Health Care subscale measured responses to the intervention and the therapeutic relationship. The Changes in Lifestyle subscale tapped impressions to the psychoeducational and behavioral change component of the intervention. Further testing and development of the adapted Patient Self-Disclosure Questionnaire is recommended as an important outcome of this study.

LIMITATIONS AND RECOMMENDATIONS

Self-disclosure is a difficult construct to study. Methods of assessing self-disclosing behavior are rare and lack generalizability to the population of interest. Self-disclosure is presently recognized as a multi-dimensional construct (Chelune, 1979). Most of the tools measuring the construct are unidimensional or do not measure the five dimensions defined by Chelune (1976). Instruments which measure multiple dimensions of self-disclosing behavior are rare. A discourse analysis research design is probably the most effective method for assessing multiple dimensions of self-disclosing behavior. A research design incorporating discourse analysis utilizing a coding scheme developed by Chelune assessing five dimensions of the construct is recommended for future studies. The discourse analysis methodology was not feasible for this investigation due to the limitation of interface with an existing study.

The interaction of female therapists with female and male clients is a confounding factor in this investigation. All three clinicians were women. There is a need to examine the interaction effects of clinician/client sex on patterns of client self-disclosure. To test for interaction effects it would be necessary to use a crossed research design with male and female clinicians and clients. The crossed design to test for interaction effects was beyond the scope of the present investigation because of the unavailability of male nurse-therapists. Earlier studies suggest that there are

interaction effects in gender of therapist or other health care provider and client self-disclosure. Hence future investigations will require male and female nurse-therapists to allow examination of interaction effects.

Finally, whether biofeedback per se alters level and depth of self-disclosure could not be tested with the design used in this investigation. Also, how the pattern of self-disclosure in a therapeutic context differs from a more bidirectional relationship could not addressed here. Further delineation of the role of self-disclosure in biofeedback is recommended in planning for future investigations. Specifically, a design that permits differentiation between client self-disclosing behavior in the context of psychotherapy and self-disclosing behavior in the context of biofeedback-assisted self-management training is recommended. Despite the limitations of this study, self-disclosure by clients during biofeedback training increased and was paradoxically associated with decrease in indicators of hypertension and increase in dimensions of psychological distress.

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APPENDIX A: PATIENT SELF-DISCLOSURE QUESTIONNAIRES

APPENDIX B: BARRETT-LENNARD RELATIONSHIP INVENTORY

UNIVERSITY OF WASHINGTON
School of Nursing
Biobehavioral Nursing Intervention With Hypertension

BARRETT-LENNARD RELATIONSHIP INVENTORY

Below are listed a variety of ways that one person could feel or behave in relation to another person. Please consider each statement with respect to whether you think it is true or not true in your *present* relationship with your clinician. Mark each statement in the left margin according to how strongly you feel it is true or not true. Use the following scale to mark your responses.

+1 I feel that it is probably true, or more true than untrue
+2 I feel it is true
+3 I strongly feel that it is true

-1 I feel that it is probably untrue, or more untrue than true
-2 I feel it is not true
-3 I strongly feel that it is not true

____ 1. She respects me.

____ 2. She tries to see things through my eyes.

____ 3. Her interest in me depends partly on what I am talking to her about.

____ 4. She disapproves of me.

____ 5. She understands my words but not the way I feel.

____ 6. What she says to me never conflicts with what she thinks or feels.

____ 7. She always responds to me with warmth and interest - or always with coldness and disinterest.

____ 8. She is curious about "the way I tick," but not really interested in me as a person.

____ 9. She is interested in knowing what my experiences mean to me.

____ 10. She is disturbed whenever I talk about or ask about certain things.

____ 11. Her feeling toward me does not depend on how I am feeling toward her.

____ 12. She likes seeing me.

____ 13. She nearly always knows exactly what I mean.

____ 14. I feel that she has unspoken feelings or concerns that are getting in the way of our relationship.

____ 15. Her attitude toward me depends partly on how I am feeling about myself.

____ 16. She is indifferent to me.

___ 17. At times, she jumps to the conclusion that I feel more strongly or more concerned about something than I actually do.

___ 18. She behaves just the way that she is in our relationship.

___ 19. Sometimes she responds to me in a more positive and friendly way than she does at other times.

___ 20. She appreciates me.

___ 21. Sometimes she thinks that I feel a certain way because she feels that way.

___ 22. I do not think that she hides anything from herself that she feels with me.

___ 23. She is friendly and warm toward me.

___ 24. She understands me.

___ 25. If I feel negatively toward her, she responds negatively to me.

___ 26. She cares about me.

___ 27. Her own attitudes toward some of the things I say or do stop her from really understanding me.

___ 28. She does not avoid anything that is important for our relationship.

___ 29. Whether I am expressing "good" feelings or "bad" ones seems to make no difference to how positively - or how negatively - she feels toward me.

___ 30. She feels that I am dull and uninteresting.

___ 31. She understands what I say from a detached objective point of view.

___ 32. I feel that I can trust her to be honest with me.

___ 33. Sometimes she is warmly responsive to me, at other times cold or disapproving.

___ 34. She is interested in me.

___ 35. She appreciates what my experiences feel like to me.

___ 36. She is secure and comfortable in our relationship.

___ 37. Depending on her mood, she sometimes responds to me with quite a lot more warmth and interest than she does at other times.

___ 38. She just tolerates me.

___ 39. She is playing a role with me.

___ 40. She is equally appreciative - or equally unappreciative of me, whatever I am telling her about myself.

___ 41. She does not really care what happens to me.

___ 42. She does not realize how strongly I feel about some of the things we discuss.

___ 43. There are times when I feel that her outward response is quite different from her inner reaction to me.

___ 44. She seems to really value me.

___ 45. She responds to me mechanically.

___ 46. I don't think that she is being honest with herself about the way she feels toward me.

___ 47. Whether I like or dislike myself makes no difference to the way she feels about me.

___ 48. She dislikes me.

___ 49. I feel that she is being genuine with me.

___ 50. Sometimes she responds quite positively to me, at other times she seems indifferent.

___ 51. She is impatient with me.

___ 52. Sometimes she is not at all comfortable but we go on outwardly ignoring it.

___ 53. She likes me better when I behave in some ways than she does when I behave in other ways.

___ 54. She feels deep affection for me.

___ 55. She usually understands all of what I say to her.

___ 56. She does not try to mislead me about her own thoughts or feelings.

___ 57. Whether I feel fine or feel awful makes no difference to how warmly and appreciatively - or how coldly and unappreciatively she feels toward me.

___ 58. What she says gives a false impression of her total reaction to me.

___ 59. I can be very critical of her or very appreciative of her without it changing her feeling toward me.

___ 60. When I do not say what I mean, she still understands me.

___ 61. She tries to avoid telling me anything that might upset me.

___ 62. Her general feeling toward me (of liking, respect, dislike, trust, criticism, anger, etc.) reflects the way that I am feeling toward her.

___ 63. She tries to understand me from her own point of view.

___ 64. She can be deeply and fully aware of my most painful feelings without being distressed or burdened by them herself.

APPENDIX C: SYMPTOM CHECKLIST 90-R

APPENDIX D:

MARLOWE-CROWNE SOCIAL DESIRABILITY SCALE

Please read each statement and decide whether you feel in general that it is mostly true as applied to you or mostly false. Please enter the appropriate letter (T-true, F-false) directly in the box provided to the right of each statement. Answer "True" to positively stated questions if they are true as often or more often than stated. For example, answer "True" to "Occasionally I play poker" if you play occasionally or more often.

ENTER "T" or "F"

1. I find it is hard to keep my mind on a task or job .....[ ]
2. I am sometimes irritated by people who ask favors of me.....[ ]
3. I am happy most of the time .....[ ]
4. Before voting, I thoroughly investigate the qualifications of all candidates .....[ ]
5. I believe I am no more nervous than most others .....[ ]
6. I sometimes think when people have a misfortune they only got what they deserved .....[ ]
7. I am more sensitive than most others .....[ ]
8. I like to gossip at times .....[ ]
9. On occasion I have had doubts on my ability to succeed in life....[ ]
10. There have been occasions when I took advantage of someone.....[ ]
11. I am a high-strung person .....[ ]
12. I have never intensely disliked anyone .....[ ]
13. I cannot keep my mind on one thing .....[ ]
14. I never make a long trip without checking the safety of my car....[ ]
15. I have periods of such restlessness that I cannot sit long in a chair .....[ ]
16. I am always courteous, even to people who are disagreeable.....[ ]
17. On a few occasions, I have given up doing something because I thought too little of my ability .....[ ]
18. I am always careful about my manner of dress .....[ ]
19. At times I think I am no good at all .....[ ]
20. I have never felt that I was punished without cause.....[ ]
21. When I don't know something, I don't at all mind admitting it ....[ ]
22. I am usually calm and not easily upset .....[ ]

ENTER "T" or "F"

23. I never resent being asked to return a favor .....[ ]
24. I am not unusually self-conscious .....[ ]
25. I sometimes try to get even, rather than forgive and forget .....[ ]
26. If I could get into a movie without paying and be sure I was was not seen, I would probably do it .....[ ]
27. I work under a great deal of pressure .....[ ]
28. I have never deliberately said something that hurt someone's feelings .....[ ]
29. I can remember "playing sick" to get out of something .....[ ]
30. I am inclined to take things hard .....[ ]
31. I sometimes feel resentful when I don't get my way .....[ ]
32. Life is a strain for me much of the time .....[ ]
33. No matter who I'm talking to, I'm always a good listener .....[ ]
34. I certainly feel useless at times .....[ ]
35. I always try to practice what I preach .....[ ]
36. There have been times when I was quite jealous of the good fortunes of others .....[ ]
37. I sometimes feel that I am about to go to pieces .....[ ]
38. I have never been irked when people expressed ideas very different from my own .....[ ]
39. My table manners at home are as good as when I eat out in a restaurant .....[ ]
40. There have been occasions when I felt like smashing things .....[ ]
41. I have sometimes felt that difficulties were piling up so high that I could not overcome them .....[ ]
42. I never hesitate to go out of my way to help someone in trouble ...[ ]
43. It is sometimes hard for me to go on with my work if I am not encouraged .....[ ]
44. At times I have really insisted on having things my own way.....[ ]
45. I feel anxiety about something or someone almost all the time.....[ ]

46. I'm always willing to admit it when I make a mistake .....[ ]

47. There have been times when I felt like rebelling against people in authority even though I knew they were right .....[ ]

48. I frequently find myself worrying about something .....[ ]

49. I have almost never felt the urge to tell someone off .....[ ]

50. I shrink from facing a crisis or difficulty .....[ ]

51. I don't find it particularly difficult to get along with loud mouthed, obnoxious people .....[ ]

52. I am certainly lacking in self-confidence .....[ ]

53. I would never think of letting someone else be punished for my wrong doings .....[ ]

APPENDIX E: EDWARDS SOCIAL DESIRABILITY SCALE

APPENDIX F: SYMPTOMS OF STRESS INVENTORY

SYMPTOMS OF STRESS INVENTORY

A Self Assessment

THIS QUESTIONNAIRE IS DESIGNED TO MEASURE THE DIFFERENT WAYS PEOPLE RESPOND TO STRESSFUL SITUATIONS. IN THE BOOK ARE SETS OF QUESTIONS DEALING WITH VARIOUS PHYSICAL, PSYCHOLOGICAL AND BEHAVIORAL RESPONSES. WE ARE PARTICULARLY INTERESTED IN THE FREQUENCY WITH WHICH YOU MAY HAVE EXPERIENCED THESE STRESS RELATED SYMPTOMS DURING THE PAST WEEK .

Check one:
( ) Screening ( ) Exit ( ) 6 Month ( ) 1 Year

DEPARTMENT OF PSYCHOSOCIAL NURSING
UNIVERSITY OF WASHINGTON

PLEASE CIRCLE THE MOST APPROPRIATE RESPONSE TO EACH QUESTION.

SOMETIMES PEOPLE UNDER STRESS EXPERIENCE A VARIETY OF PHYSICAL RESPONSES. DURING THE DESIGNATED PERIOD HAVE YOU BEEN BOTHERED BY:	Never	Infrequently	Sometimes	Often	Very Frequently
1. *Flushing of your face*	0	1	2	3	4
2. *Sweating excessively even in cold weather*	0	1	2	3	4
3. *Severe itching*	0	1	2	3	4
4. *Skin rashes*	0	1	2	3	4
5. *Breaking out in cold sweats*	0	1	2	3	4
6. *Cold hands or feet*	0	1	2	3	4
7. *Hot or cold spells*	0	1	2	3	4
HAVE YOU NOTICED ANY OF THE FOLLOWING SYMPTOMS WHEN NOT EXERCISING:					
8. *Pains in your heart or chest*	0	1	2	3	4
9. *Thumping of your heart*	0	1	2	3	4
10. *Rapid or racing heart beats*	0	1	2	3	4
11. *Irregular heart beats*	0	1	2	3	4
12. *Rapid breathing*	0	1	2	3	4
13. *Difficult breathing*	0	1	2	3	4
14. *A dry mouth*	0	1	2	3	4
HAVE YOU EXPERIENCED:					
15. *Having to clear your throat often*	0	1	2	3	4
16. *A choking lump in your throat* ...	0	1	2	3	4
17. *Hoarseness*	0	1	2	3	4
18. *Nasal stuffiness*	0	1	2	3	4
19. *Colds*	0	1	2	3	4
20. *Colds with complications (e.g. bronchitis)*	0	1	2	3	4

	Never	Infrequently	Sometimes	Often	Very Frequently
44. *Legs*	0	1	2	3	4
45. *Tension headaches*	0	1	2	3	4
IN YOUR DAY-TO-DAY ACTIVITIES, HAVE YOU NOTICED SYMPTOMS OF ANXIETY OR RESTLESSNESS, SUCH AS:					
46. *Fidgeting with your hands*	0	1	2	3	4
47. *Pacing*	0	1	2	3	4
48. *Chewing on your lips*	0	1	2	3	4
49. *Difficulty sitting still*	0	1	2	3	4
50. *Increased eating*	0	1	2	3	4
51. *Increased smoking*	0	1	2	3	4
52. *Biting your nails*	0	1	2	3	4
53. *Having to urinate frequently*	0	1	2	3	4
54. *Having to get up at night to urinate*	0	1	2	3	4
55. *Difficulty in falling asleep*	0	1	2	3	4
56. *Difficulty in staying asleep at night*	0	1	2	3	4
57. *Early morning awakening*	0	1	2	3	4
58. *Changes in your sexual relationship*	0	1	2	3	4
59. *Working tires you out completely*	0	1	2	3	4
60. *Severe aches and pain make it difficult for your to do your work*	0	1	2	3	4
HAVE YOU NOTICED:					
61. *Worrying about your health*	0	1	2	3	4
62. *Stuttering or stammering*	0	1	2	3	4
63. *Shaking or trembling*	0	1	2	3	4
64. *Being keyed up and jittery*	0	1	2	3	4
65. *Feeling weak and faint*	0	1	2	3	4
66. *Frightening dreams*	0	1	2	3	4

	Never	Infrequently	Sometimes	Often	Very Frequently
85. Your anger is so great that you want to strike something	0	1	2	3	4
86. You let little annoyances build up until you just explode	0	1	2	3	4
87. You become so upset that you hit something	0	1	2	3	4

IN YOUR DAY-TO-DAY LIVING DO YOU FIND:

88. Your thinking gets completely mixed up when you have to do things quickly	0	1	2	3	4
89. You must do things very slowly to do them without mistakes	0	1	2	3	4
90. You get directions and orders wrong	0	1	2	3	4
91. You are unable to keep thoughts from running through your mind	0	1	2	3	4
92. Frightening thoughts keep coming back	0	1	2	3	4
93. You become suddenly frightened for no good reason	0	1	2	3	4
94. You have difficulty in concentrating	0	1	2	3	4

95. What other ways do you experience stress, tension or anxiety?

_____

_____

_____

_____

APPENDIX G: CONSENT FORM

University of Washington
School of Nursing
Biobehavioral Nursing Intervention with Hypertension

Consent Form

Principal Investigators:
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Robert Burr, PhD, Senior Research Fellow, Psychosocial Nursing 543-3108
Sue Hendershot, RN, MS, Pre-Doc RA II, Psychosocial Nursing 543-4146
Emergencies: Subjects who are being withdrawn from medication by their personal physicians, if an emergency occurs, please call your private physican.

PURPOSE AND BENEFITS

The purposes of this study are to determine the characteristics of people who can learn to control their own blood pressure (hypertension) without medications and to learn about what happens to blood pressure during self-management training for blood pressure control. Subjects may benefit from participating by learning more about their own health if they learn to control their blood pressure without medications. Information from the study will contribute to scientific understanding of stress response management.

PROCEDURES

Subjects who are eligible will participate in the following:

1. Orientation: Subjects who are interested in taking part in the study will come to an orientation session which will last one and one-half hours. They will be told about the study and study criteria. They will be given this consent form and the consent form for echocardiogram measurement of aortic diameter to complete at this time. Subjects will be asked to complete an exchange of information form. This form will allow our program to contact subjects' primary and other health care providers to obtain copies of medical records. This will allow us to provide the best care possible. In addition, it will notify health care providers of subjects' participation in our program, thus assuring a continuity of care. This information will not be included in the data set for research purposes.

   Subjects will purchase a blood pressure cuff and will be instructed in how to measure and record their blood pressures. The money for the cuff will be refunded if the subjects choose to return the cuff at the end of the study.

2. Pre-Screening : This visit will last about one and one-half hours. During this time, subject will participate in the following:

   a. Health history interview: This interview includes demographic information, health history and lifestyle questions. It will take approximately 20 minutes.

   b. A 90-item rating scale about how much subjects are bothered by various problems and symptoms such as "feeling blue," or "loss of sexual interest or pleasure."

   c. 15 questions about body awareness, such as "I can often feel my heart beating," and "I'm capable of moving quickly."

   d. 23 questions about awareness of inner thoughts and feelings, such as "I reflect about myself a lot," and "I'm self-conscious about the way I look."

   e. 39 questions about personal beliefs, such as "I don't let things bother me the way some people do," and "I always keep control of my emotions."

   f. 40 questions about self-disclosure during the interview, such as "to what extent did you discuss any physical complaints" and "how difficult is it for you to discuss being lonely?" This will be the last questionnaire you complete. You will be asked to place your response in an envelope and seal it. Your clinician will not see your responses.

   Subjects will have their blood pressure measured and will have measurement of cardiac output using an UltraCOM machine (ultrasound uses high frequency sound waves). The UltraCOM measurement involves placing a probe on the skin of the chest and neck as the clinician monitors the sound waves.

3. Baseline Period: Subjects who are taking hypertensive medications will measure their blood pressures for two weeks and will then begin a program to wean them from medications. They will be under the supervision of the study's consulting physician who will design a program to reduce the amount of hypertension medication taken and finally stop it altogether. Subjects will be seen in the Hypertension Clinic at the University of Washington usually twice, each visit one week apart. Here Dr. Davidson, the consulting physician, will determine the rate of medication withdrawal and monitor the effects of decreasing medication. These visits will last approximately one-half hour and be free of charge to the subject. This process may take from two to six weeks, during which time the subjects will be taking and recording their blood pressures twice a day and sending in the results to the research team once a week. If subjects' blood pressure is too unstable (see handout "Blood Pressure Alerts" for information regarding unstable blood pressure) during this period, they will be seen by Dr. Davidson and advised. Subjects may elect to have their own physician withdraw antihypertensive medication(s). In this instance, the subject will incur all costs associated with withdrawal of antihypertensive medication. When subjects have stabilized their blood pressures after they have been weaned off medication, all subjects will continue to take their blood pressures twice a day and record them in a log. This will take about five minutes

each day. Once a week, they will send the log to the investigators.

4. Echocardiography at Diagnostic Imaging: If your recordings of blood pressure taken at home show you are eligible to continue in the study, subjects will be asked to have an independent measurement of aorta size done at an echocardiology lab, Diagnostic Imaging. This will be done at no cost to subjects. The procedure is noninvasive, produces no discomfort, and will take about 20 minutes. You will be asked to lie on your back or side. A small device (called a "transducer") will be placed on your chest or upper abdomen, using a water-soluble, non-toxic gel to improve image quality. The transducer sends out a wave of high-pitched sound that is reflected back from heart structures and used to create pictures of the heart that can be viewed on a TV screen and recorded on tape or paper for future analysis.

5. Screening: The screening visit will take place after the baseline period and will take about two and one-half hours. The screening will include two four minute mental tasks - unscrambling anagrams and solving arithmetic problems. The screening will include a physical task where the left hand will be placed in cold water (0-4 degrees C) for one and one-half minutes. Each of the above tasks is separated by a five minute rest period. The following procedures will be done during the series of rests and mental and physical tasks.

   a. Blood pressure and heart rate will be measured.

   b. Muscle tension will be measured by attaching three sensors to the surface of the skin (head, face and neck) with adhesive disks and measuring the electrical impulses which cause muscles to contract. Muscle tension will be measured while subjects perform the physical and mental tasks.

   c. Skin temperature will be measured by placing sensors on the skin surface of the hand.

   d. Peripheral blood flow will be measured by attaching a light sensor to the subjects' right thumb using adhesive disks and a Velcro strap.

   e. Temporal artery blood flow will be measured by attaching a light sensor over the subjects' temporal artery using adhesive disks.

   f. Breathing rate and depth will be measured by placing an elastic Velcro strap around the subjects' chest.

   g. The UltraCOM measurement will be repeated as in the pre-screening.

   During the screening, you will also be asked to answer psychological questionnaires including:

      i. A 90-item rating scale about how much subjects are bothered by various problems and symptoms such as "feeling blue," or "loss of sexual interest or pleasure."

      ii. 15 questions about body awareness, such as "I can often feel my heart beating," and "I'm capable of moving quickly."

RISKS, STRESS, OR DISCOMFORT

There may be some risk associated with tapering off and stopping hypertensive medications. Approximately one-half of subjects tend to stay normotensive after medication withdrawal. Most others experience only moderate rise of blood pressure over the six months after withdrawal. Risks of medication withdrawal include an increase in blood pressure, and some subjects might show symptoms of heart changes, stroke, or kidney changes. Medication decrease will be monitored and supervised by the consulting physician and any possible indications of problems will receive his immediate attention.

The stressors associated with this study include answering questions subjects may regard as personal and sensitive. They are free not to answer any questions. Some people find the pressure from the UltraCOM probe on the neck and chest uncomfortable.

OTHER INFORMATION

Other methods for controlling blood pressure are available. These include medications, exercise, and diet. These are not included as part of this study.

The identity of subjects will remain confidential. Only the research staff will have access to the data which will be retained indefinitely. Subjects may refuse to participate and may withdraw from the study at any time without penalty or loss of benefits to which they are otherwise entitled. Subjects will not be paid, but they will receive the intervention program at no cost. Subjects will be required to purchase a blood pressure cuff at the beginning of the study, but may return it for a full refund at the end of the study if they so desire. In the event of a physical injury as a direct result of study procedures, subjects will be referred for appropriate treatment. Subjects and/or their insurance companies will be responsible for the costs of such care.

Signature of Investigator — Date 5/17/90

Subject's Statement

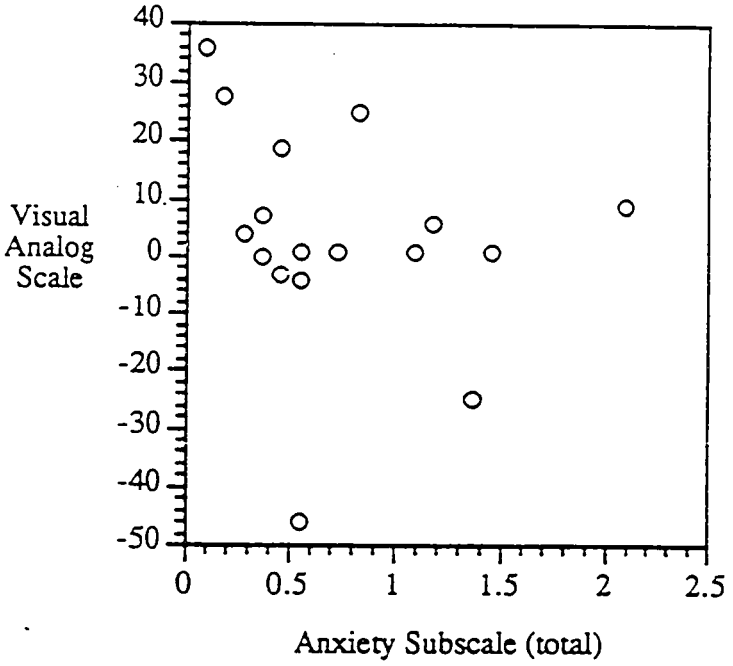
The study described above has been explained to me and I voluntarily consent to participate in this activity. I have had an opportunity to ask questions. I understand that future questions I may have about the research or about my rights as a subject will be answered by one of the investigators listed above.

Signature of Subject — Date

copies to: Subject
Investigator's file

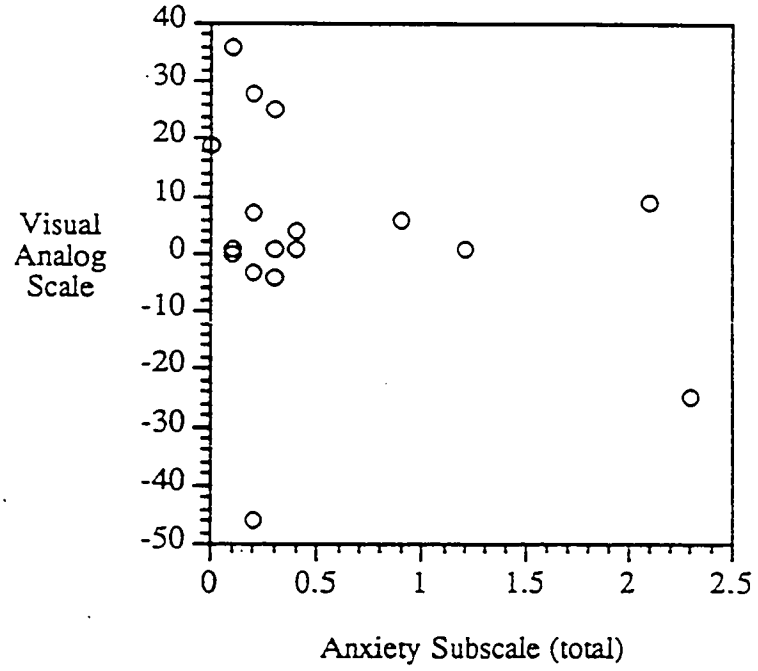
APPENDIX H: NON-SIGNIFICANT CORRELATIONS

Correlation between Change in Self-Disclosure VAS
and the Anxiety Subscale Symptoms of Stress Inventory (n=18)



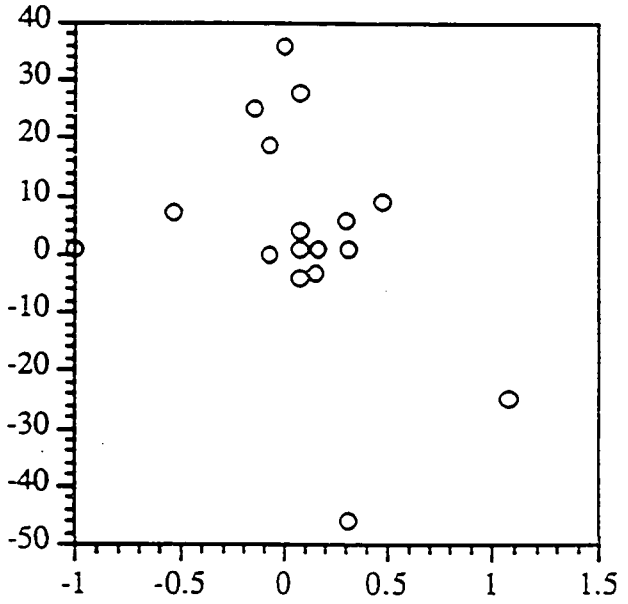
r = -.30

Correlation between Change in Self-Disclosure VAS
and the Anxiety Subscale SCL-90-R (n=18)



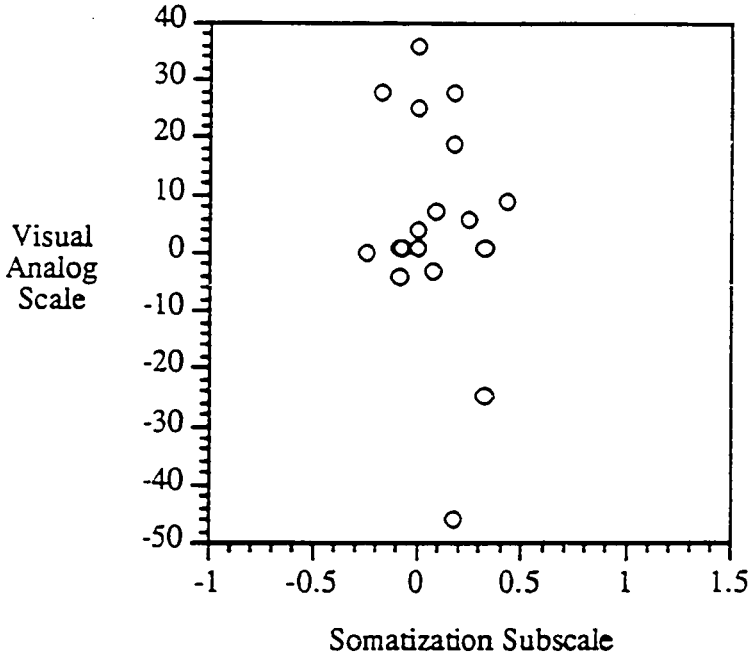
r=-.28

Correlation between Change in Self-Disclosure VAS and Change in Depression Subscale of SCL-90-R from Session 2 to Session 13 (n=18



r=-.32

Correlation between Change in Self-Disclosure VAS and Change in Somatization Subscale of SCL-90-R from Session 2 to Session 13 (n=18)



r = -.22

Curriculum Vitae: SUSAN CHRISTINE HENDERSHOT

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ACADEMIC AND PROFESSIONAL EDUCATION

1968-1971	University of Oregon Portland, Oregon	Bachelor of Science Nursing Major
1977	University of Colorado Boulder, Colorado	Completed Requirements Psychology Major
1978-1980	University of Washington Seattle, Washington	Master of Nursing
1986-present	University of Washington Seattle, Washington	Doctoral Student Nursing Major

PROFESSIONAL EXPERIENCE

1971-1972	Clinic Nurse Instructor Contraceptive Classes	University of Oregon Student Health Center Eugene, Oregon
1972-1973	Staff Nurse Psychiatric Services	Sacred Heart Hospital Johnson Unit Eugene, Oregon
1973-1974	Staff Nurse Psychiatric Services	Providence Hospital Seattle, Washington
1974-1975	Staff Nurse Adult Psychiatric Unit	Cabrini Hospital Seattle, Washington
1976-1977	Staff Nurse Adolescent Unit	Mt. Airy Psychiatric Center Denver, Colorado
1978	Mental Health Consultant & Home Health Care Nurse	Snohomish County Visiting Nurses' Association Everett, Washington

1980-1981	Clinical Coordinator & Research Associate, Stress Response Assessment Project	School of Nursing University of Washington Seattle, Washington
1980-1982	Co-Principal Investigator, Psychophysiologic and Physiologic Responses of Men and Women to a Low and Moderate Intensity Exercise Program	UW Retirement Association University of Washington Seattle, Washington
1982-1983	Biofeedback/Stress Management Therapist	Electrodiagnosis and Rehabilitation Clinic Everett, Washington
1984-1985	Research Associate Primary Care Nursing Clinic Treatment of Orofacial Pain Module	Psychosocial Nursing University of Washington
1989	Research Assistant Self-Management of Sudden Cardiac Arrest Pilot Study	Psychosocial Nursing University of Washington Seattle, Washington
1990	Research Assistant Longitudinal Experiences of Hypertension During Self-Monitoring	Psychosocial Nursing University of Washington Seattle, Washington
1991	Research Assistant Hospital Improvement Task Force	Western State Hospital Steilacoom, Washington
1991	Instructor (on site Autumn Quarter) PSN 520 Methods of Research in Nursing	Eastern State Hospital Spokane, Washington Western State Hospital Steilacoom, Washington

RESEARCH, ACADEMIC, AND PROFESSIONAL HONORS/AWARDS

1970	Member of Interdisciplinary Student Team to Evaluate Health Care Facilities in Regional Job Corps Centers
1970	National Institute of Mental Health Traineeship University of Oregon, Portland, Oregon
1978	National Institute of Mental Health Traineeship University of Washington, Seattle, Washington
1985	Citation Paper, 16th Annual Meeting of Biofeedback Society of America

1985 Certification as Clinical Specialist in Adult Psychiatric and Mental Health Nursing

1985 Certification in Biofeedback by the Biofeedback Certification Institute of America

1989 Individual National Research Service Award #1 F31 NR06436-01

CONSULTATION EXPERIENCE

1977 Physiological indices of a stress response in rats exposed to microwave radiation, Richard Lovely, PhD, Principal Investigator

1979-1980 Biofeedback/self-management training for TMJ. Consultant to James H. Howard, DDS

1983 Health Management Program Steering Committee Member
University of Washington Health Management Program

PUBLICATIONS

1980 Hendershot, S. Master's Thesis: A physical exercise training program as a method of learning to relax. (unpublished)

1981 Hendershot, S.; Beaton, R.; Betrus, P; and Burr, R. A comparison of EMG biofeedback/stress counselling and a physical exercise training program. Proceedings of the 10th Annual Conference of the Biofeedback Society of America. pp.9-12.

1981 Hendershot, S., Physiological basis of the stress response. In Scene Course III, Stressors in Nursing Responses and Resolutions, University of Washington

1983 Kogan, H.; Egan, K.; Garber, A.; Jarrett, M.; and Hendershot, S. Multimodal treatment of borderline hypertension. Proceedings of the 14th Annual Conference of the Biofeedback Society of America

1983 Nakagawa-Kogan, H.; Bowers, J.; Egan, K.; Garber, A., Hendershot, S.; Jarrett, M. Hypertension regulation: Influence of non-physiologic parameters on self-management training (symposium); "Client and therapist variables as related to treatment outcome with borderline hypertensive males in a self-management program." Proceedings of the 16th Annual Communicating Nursing Research Conference, Western Society for Research in Nursing of Western Interstate Comm. of Higher Education for Nursing.

1985 Beaton, R.; Nakagawa-Kogan, H.; Hendershot, S.; Betrus, P. Psychological benefits of multimodal EMG biofeedback for patients with musculoskeletal pain. Proceedings of the 16th Annual Meeting of the Biofeedback Society of American, 0:14-17

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1990 Nakagawa-Kogan, H.; Cowan, M.; Burr, R.; Hendershot, S.; Buchanan, L. Sudden cardiac arrest: Mechanisms and outcomes of self-management training. Presented at the Western Society for Research in Nursing (WSRN) 1990 Conference, May 2-5, 1990, Denver, CO. Abstract published in Communicating Nursing Research, Vol. 23, Spring, 1990.

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1991 Hendershot, S. Self-disclosure in biofeedback of hypertension. Poster Session of the 4th National Conference Theory and Research-Based Psychosocial Nursing Practice, July 21-23, 1991, Seattle, WA

1991 Hendershot, S. PhD Dissertation: Self-disclosure in biofeedback of hypertension. (unpublished)

1992 Hendershot, S.; Nakagawa-Kogan, H.; Hamilton, P.; Strasser, M.R. Self-disclosure in biofeedback of essential hypertension. Western Society for Research in Nursing: Western Institute of Nursing 25th Annual Communicating Nursing Research Conference, April 29 - May 2, 1992, San Diego, CA (abstract submitted)

1992 Hendershot, S.; Nakagawa-Kogan, H.; Hamilton, P.; Strasser, M.R. Subject reactivity to self-disclosure in biofeedback. Association for Applied Psychophysiology and Biofeedback: 23rd Annual Meeting, March 19-24, 1992, Colorado Springs, CO (abstract, submitted)

PROFESSIONAL MEMBERSHIP

American Nurses' Association
Washington State Nurses' Association
Association for Applied Psychophysiology and Biofeedback

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