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Affective empathy training with senior citizens using Zazen (Zen) meditation

Newman, Jane Ann, Ph.D.
The University of Arizona, 1993
AFFECTIVE EMPATHY TRAINING WITH
SENIOR CITIZENS USING ZAZEN (ZEN) MEDITATION

by
Jane Ann Newman

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A Dissertation Submitted to the Faculty of the
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In the Graduate College
THE UNIVERSITY OF ARIZONA

1993
As members of the Final Examination Committee, we certify that we have read the dissertation prepared by Jane Ann Newman entitled Affective Empathy Training with Senior Citizens Using Zazen (Zen) Meditation and recommend that it be accepted as fulfilling the dissertation requirement for the Degree of Doctor of Philosophy.

Amos Sales

Inez Tucker

Bob Johnson

Charles Brainard

John Bergan

Final approval and acceptance of this dissertation is contingent upon the candidate's submission of the final copy of the dissertation to the Graduate College.

I hereby certify that I have read this dissertation prepared under my direction and recommend that it be accepted as fulfilling the dissertation requirement.

Dissertation Director
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SIGNED

[Signature]
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DEDICATION

This dissertation is dedicated to my family for all the years of support given to me while I completed the degree of Doctor of Philosophy. Very special thanks are given to my sons, William Terry Newman, Robbin Dale Newman, and Patrick Yearwood Newman and to my husband, Thomas H. Herbst.
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ABSTRACT

As an individual moves into the later years of life, he or she is prone to loss of interpersonal skills and support from others. Affective empathy is considered to be a skill which assists individuals in building interpersonal relationships and thereby increasing support from others. Zazen (Zen) meditation is proposed to increase affective empathic responses.

The current study involved 19 senior citizens, ages 60-77 (six males and 13 females) randomly assigned to either a control group or an experimental group. The experimental group received zazen (Zen) meditation training and the control group received an irrelevant activity (mathematical exercises). Each group received the activity for five days, three hours per day. Affective empathy was measured pretest and posttest. The pretest was the Emotional Empathic Tendency Scale (Mehrabian & Epstein, 1972) and the posttest was the Empathic Concern subscale of the Interpersonal Reactivity Index (Davis, 1980, 1983c).

Analysis of the data produced statistically nonsignificant findings. Larger numbers and/or longer training times may provide significant findings in future studies. The levels of affective empathy (i.e. low, intermediate, high scorers) were not considered in the current study but attention to these variables in future research and in training for affective empathy using zazen (Zen) meditation is recommended.
CHAPTER I

Rehabilitation efforts frequently focus on helping individuals to reach their highest functional level. Zazen (Zen) meditation is the approach used in the current study to train senior citizens in the use of affective empathy. The use of affective empathic skills is considered to be an important function in successful interpersonal relationships. The current study pursues the question of whether training of senior citizens in affective empathy will enhance their affective empathy levels thereby improving their interpersonal functioning, developing their sense of well-being, and decreasing their isolation from others.

The senior citizen in our society moves into a period of life in which interpersonal resources may diminish due to; a lack of social supports (e.g. Holahan & Holahan, 1987; Mancini, 1979), isolation (e.g. Cumming & Henry, 1961; Reinhart & Sargent, 1980), and a devaluation of the elderly by society (e.g. Atchley, 1991). These diminished resources appear to result in an increased need for interpersonal relatedness and emotional support from others (e.g. Ebersol & Hess, 1981; P. S. Kaplan, 1988). Interpersonal relationships appear to be important to senior citizens for the maintenance of a stable support system (e.g. Cobb, 1976; Holahan & Holahan, 1987; Kessler & McLeod, 1985; Mancini, 1979).

Statement of the Problem

Traditional delivery of interpersonal-skill training with senior citizens usually does not include empathy training. When empathy training is included, the training
occurs as communication of empathy (e.g. Becker & Zarit, 1978) as opposed to affective empathy (e.g. Isquick, 1981). Information about the effectiveness of affective empathy training is needed in order to further develop interpersonal skill training programs for senior citizens (e.g. Isquick, 1981). Information from the current study of zazen (Zen) meditation may be used to further develop affective empathy training programs for senior citizens.

The results of an increase in affective empathic responding should add to the ability in interpersonal competence in order to decrease isolation, increase a sense of well-being, and increase a sense of connection to and helping of others (e.g. Davis & Oathout, 1987; Hoffman, 1977; P. S. Kaplan, 1988; Toi & Batson, 1982).

Significance of the Problem

As individuals move into the later years of life, they are prone to loss of lifetime roles and support from others (e.g. Ebersole & Hess, 1981; Lopata, 1983). Senior citizens (e.g. Aizenberg & Tres, 1985; Murrell & Norris, 1984; Reinhart & Sargent, 1980) and individuals in general (e.g. Davis & Oathout, 1987) attain a sense of well-being and relationship satisfaction when their interpersonal relationships are strengthened and maintained. Affective empathic responding enables individuals to relate to and help others (e.g. Batson, Duncan, Ackerman, Buckley, & Birch, 1981; Toi & Batson, 1982) and is viewed as an important response in supportive interpersonal relationships (e.g. Davis & Oathout, 1987; Keefe, 1976).
The current study proposes that zazen (Zen) meditation will increase affective empathic responding with senior citizens.

The expected results are based on the following theories or assumptions: 1) senior citizens have needs for improved interpersonal relationships (e.g. Holahan & Holahan, 1987; Mancini, 1979); 2) they are able to learn the skills needed for these improvements (e.g. P. S. Kaplan, 1988; Isquick, 1981); 3) affective empathic responding allows individuals to improve their interpersonal skills (e.g. Davis & Oathout, 1987; Hansson, Jones, & Carpenter, 1984; Keefe, 1975, 1976); and 4) zazen (Zen) meditation is an effective method to train affective empathy (e.g. Keefe, 1976, 1979; Lesh, 1970).

Purpose of the Study

The purpose of the current study is to increase affective empathic skills in senior citizens using zazen (Zen) meditation as a training method.

Definition of Terms

The following are definitions of terms as utilized within the current study.

Affective empathic skill - an ability to focus one's attention on the moment to moment experiences (includes physical responses such as muscle tension and heartbeat) while putting cognitive responses on hold (Keefe, 1979).

Affective empathic response - an emotional response to another based on physiological arousal (e.g. skin conductance; heart rate; vasoconstriction ) (e.g. Krebs, 1975; Stotland, 1969); an emotional response that occurs partly through identification
with another and partly through the relaxation of one’s own conscious control, relaxation of cognitive thought processes, and attendance to one’s own feelings (Keefe, 1979); and a vicarious affective response to one’s perceptions of another’s emotions (e.g. Hoffman, 1977; Mehrabian & Epstein, 1972).

Cognitive empathic skill - an ability to identify another’s emotions as akin to one’s own (e.g. P. J. Kaplan & Arbuthnot, 1985); and to understand another’s feelings and thoughts from the other’s point of view (e.g. Grief & Hogan, 1973; Rotenberg, 1974).

Cognitive empathic response - an intuitive, thinking response (covert) to another based on constructing for oneself another’s feelings and thoughts (e.g. Hogan, 1969; Rotenberg, 1974); identification and perceptions of another’s emotional experience (e.g. Deutsch & Madle, 1975; Pecukonis, 1990).

Empathic skill - a complex human behavior which contains; 1) perception of nonverbal and verbal communications from another, 2) accurate understanding of the meanings of these communications, 3) experience of affective responses to the communications of the other person while holding cognition in temporary abeyance, 4) separation of one’s own feelings from the feelings one experiences as belonging to another person (Keefe, 1979) and 5) the communication of these responses to another (e.g. Carkhuff, 1969; Rogers, 1957).

Empathic response - a related set of constructs which encompasses both empathic cognitive, affective (e.g. Davis, 1980, 1983c; Deutsch & Madle, 1975) and
communicative (e.g. Carkhuff, 1969) responses; sharing the feelings of another while keeping one's own feelings separate (e.g. Deutsch & Madle, 1975); "the reactions of one individual to the observed experiences of another" (Davis, 1983c, p. 113).

Senior citizen - any individual whose chronological age is greater than 60 years of age.

True (total) empathy - The empathic response consisting of affect and cognition after observing the overt reactions of another and the resultant communication of these responses to the person being observed (Hogan, 1969; Keefe, 1976).

Zen meditation - Zen means meditation (Wienpahl, 1964); meditation that is a disciplined practice in concentrating attention and is considered to be "a set of techniques designed to bring about specific changes in behavior and experience" (Radford, 1976, p. 57). The basic exercise consists of motionless sitting and some form of concentration to increase perceptual sensitivity (Maupin, 1962).

Zazen meditation - Zazen means "sitting Zen meditation" (Lesh, 1970, p. 42); to sit motionless and concentrate on one's own breathing. Zazen and sanzen combine to form the parameters of Zen meditation (Y. Akishige, 1977).

Limitations

The subjects selected for this study are from an east central rural area of the state of Arizona located in the Southwestern United States and may be a biased subsample.
The empathic response has a large and extensive domain from which to select items for the testing instruments. In addition, more than one type of empathic process may exist (Gladstein, 1987). The definitiveness of affective empathy is limited to the definitions from the testing instruments and the definitions from the studies of zazen and Zen meditation.

Delimitations

Attempts to generalize to senior citizens under age 60 or over age 77, to other areas of the country and other cultures must be made with caution.

Zazen (Zen) meditation as a training package for affective empathy is still in the theoretical stage of development. Empirical evidence exists which demonstrates that zazen (Zen) meditation training results in positive changes in the affective empathic response (e.g. Keefe, 1979; Lesh, 1970) is limited to a few studies.

Hypotheses

Individuals trained in deep breathing techniques (zazen (Zen) meditation) show no difference in affective empathy scores from individuals who experience an irrelevant activity (basic mathematics).

Null hypothesis: \( \text{Ho: } u_2 = u_4 \)

Alternative hypothesis: \( \text{H1: } u_2 > u_4 \)

Alpha is set at the .05 level of significance to decrease the probability of accepting a true null hypotheses and avoiding Type II errors.
Summary

The current study proposes to study the application of zazen (Zen) meditation as a training technique to enhance affective empathic abilities in a population of senior citizens. Theoretically, affective empathy may be enhanced or trained using zazen (Zen) meditation breathing exercises. Senior citizens, by virtue of aging, have increased needs for human contact and decreased opportunities or skills to fulfill those needs. The use of zazen (Zen) meditation to increase affective empathic skills should meet the needs, in part, for improved interpersonal relationships of the senior citizen.
CHAPTER II

Literature Review

The review of the literature will be presented in two sections. The first section will review relevant literature on; 1) senior citizens, 2) the construct of empathy (affective, cognitive, communication responses, and behavioral models of empathy), and 3) the concepts of Zen (Zen meditation and zazen meditation). The second section will review research selections representative of the following empirical studies: 1) the independent variable (physiological and psychological evidence for zazen (Zen) meditation) and, 2) the dependent variable (evidence that empathy is a trainable skill in the areas of: a) affective empathy, b) empathy with senior citizens and c) empathy and zazen (Zen) meditation.

Senior Citizens

The importance of interpersonal relationships in the senior citizen cannot be exaggerated (e.g. P. S. Kaplan, 1988). Evidence exists suggesting that social networks shrink with increased age (e.g. Fisher & Phillips, 1982; Larson, Zuzanck & Mannell, 1985). The aspects attributed to this shrinkage are; the death of a spouse, children developing their own lives, grandparenting, great-grandparenting, and an overall changing role with society (e.g. P. S. Kaplan, 1988). Relationships become important as conditions (e.g. poor health, transportation difficulties) make contact with others less possible. An assumption cannot be made that because senior citizens once had
supportive networks that they possess the skills necessary to develop new networks (e.g. Hogg & Heller, 1990).

The socially isolated, as senior citizens often are, may lack the interpersonal relationship skills to build and maintain supportive networks (e.g. Hogg & Heller, 1990). The components of interpersonal competence that relates to supportive relationship development have been found to include assertion, empathy, and role-taking skills (e.g. Davis, 1983c; Hogg & Heller, 1990; Riggio, 1986). The maintenance of these supportive relationships has been found to be related to empathy and role-taking (e.g. Hansson, Jones, & Carpenter, 1984). The ability to respond with affective empathy has many implications for developing facilitative interpersonal skills.

Do senior citizens possess the abilities to learn new material? The question appears to be related to the conditions under which learning occurs rather than whether learning occurs (e.g. Isquick, 1981; P. S. Kaplan, 1988). Environmental manipulation of certain conditions make learning more effective. Many senior citizens are able to compensate for the slowing of the senses through medical intervention, environmental manipulation, and planning (e.g. eyeglasses, hearing aids, etc.). Performance in learning improves when specific instructions are provided (e.g. Craik, 1977) and attention is focused on one item at a time (e.g. P. S. Kaplan, 1988). Time to respond and to learn improves performance.

Senior citizens appear to be in need of supportive networks which tend to shrink with increasing age. Affective empathic skills appear to relate to an increase in
abilities to function in interpersonal functioning. Senior citizens are capable of learning new skills and affective empathic responding would provide them with a valuable asset in order to increase their abilities to provide themselves with additional support from others.

The Construct of Empathy

A body of research, which has grown over the past century, has been productive in providing a comprehensive understanding of the construct of empathy (e.g. Deutsch & Madle, 1975; Dymond, 1950; N. D. Feshbach & Roe, 1968; Gladstein, 1983; Lipps, 1926, 1935; Titchener, 1909).

The empathic process as limited to being either affective or cognitive was an argument among theorists and researchers for many years. An evolutionary process has currently produced the thinking that the empathic construct contains at least affective, cognitive, and communicative responses.

The description of empathy as the "imaginative transposing of oneself into the thinking, feeling, and acting of another" (Dymond, 1950, p. 343) was a precursor to the contemporary definition of the empathic response as multivariate and multidimensional in nature and encompassing affective, cognitive, and communicative responses (e.g. Bachrach, 1976; Barrett-Lennard, 1981; Batson et al., 1981; Carkhuff, 1969; Coke, Batson, & McDavis, 1978; Davis, 1980; N. D. Feshbach & S. Feshbach, 1982; Gladstein, 1987; Goldstein & Michaels, 1985; Katz, 1963; Keefe, 1976; Stotland, 1969; Truax & Carkhuff, 1967).
The affective, cognitive and communicative aspects of empathy may be difficult to differentiate (e.g. P. J. Kaplan & Arbuthnot, 1985). The literature suggests that each response requires a different skill (e.g. Goldstein & Michaels, 1985; Keefe, 1976; Smither, 1977).

Current training in empathy is primarily related to the communication response particularly in the training of counselors and psychologists. The emphasis is that whether or not an individual is actually responding empathically, (either affectively or cognitively), is irrelevant. What is important conceptually is that the individual "seems empathic" (Hogan, 1975, p. 17).

Truly (totally) empathic individuals, appear to have all of the responses available to them. True (total) empathy appears to be the ability to access all of the responses depending upon the nature of the situation. Empathic skill appears to be the result of the training of these empathic responses.

Affective Empathic Response

The affective empathic response is the ability to feel the other person's experience as if it were one's own and allowing analytic thinking to become background (Lesh, 1970). Training individuals to respond with affective empathy develops a capacity to experience immediately the affective responses and to focus on those responses. Unless an individual knows what he/she is experiencing, the ability to empathize becomes distorted. Although understanding another is possible without an emotional response, true (total) empathy includes affect (Keefe, 1976). A current
argument is that the affective (emotional) response is the total (true) empathic response, while cognition (understanding) only increases the level of the total empathic response (Coke, et al, 1978; N. D. Feshbach, 1975; Stotland, 1969).

The position that affective empathy is the result of an emotional response based on physiological arousal is purported by Coke, et al, (1978). Individuals who demonstrate high levels of affective empathy also demonstrate a higher degree of physiological responses such as galvanic skin response, blood pulse volume, and changes in heart rate (e.g. Gellen, 1970; Krebs, 1975; Stotland, 1969; Vanderpool & Barrat, 1970).

The Cognitive Empathic Response

The cognitive empathic response leads an individual to perceive and understand another’s feeling states (Keefe, 1976). Cognitive distortions (e.g. stereotyping and value judgments) by reducing the total (true) empathic response, reduces empathic skills. These cognitive distortions are thought to interfere with the empathic affective response and the ability to distinguish between similarity of feelings between the observer and the observed. An individual’s ability to understand another’s point of view relates to an ability to be more socially acute and sensitive in interpersonal interacting (Hogan, 1969). Individuals low in the ability to understand another’s point of view are prone to engage in negative interpersonal interactions.
The Communication Response

Extensive research exists in training people to communicate empathy (e.g. Carkhuff, 1969; Egan, 1975; Goldstein & Michaels, 1985; Rogers, 1957). The communication to another of empathic understanding is one of the core conditions (empathy, warmth, and genuineness) thought to be important to facilitate interpersonal relationship functioning (e.g. Carkhuff, 1969; Carkhuff & Berenson, 1967; Rogers, 1957; Truax & Carkhuff, 1967).

One program for the communication of empathic understanding has been developed and has been used primarily in academics (Truax & Carkhuff, 1965, 1967). Through training sessions, an attempt is made to train and develop sensitivity and skill in empathic communication. Rating scales devised for the communication of empathy have nine levels and are designed for rating the perceptions and responses of trainees (Truax, 1961, 1962a, 1962b). A helper’s rating depends upon his/her ability to communicate to the helpee his/her understanding of the helpee’s problems.

Behavioral Models of Empathy

One of the behavioral models of empathy shows the cognitive, affective, and communicative empathic responses occurring in phases (Keefe, 1979). The first phase begins when an individual perceives the verbal and nonverbal behaviors of another and allows these perceptions to directly elicit feeling responses (Keefe, 1976). In the second phase, the individual allows these feeling responses to resonate while separating them from the cognitive responses and holding the cognitive responses "in
temporary abeyance" (p. 12). The third phase allows for the individual to then separate
the affective responses in himself/herself from those of another and to label these
responses. An ability to direct one’s attention to one’s feelings and the facility in
cognitively sorting and labeling these feelings" (p. 12) occurs during this separation.
The phases of the empathic response are completed through accurate communication
of the experience. Conclusions which parallel Keefe’s (1976) phases of empathic
responses are: 1) identification with another; 2) awareness of one’s feelings after the
identification; 3) awareness of another’s feelings after the combination of one and two
(Fenichel, 1945) and then communicating these responses to another (Carkhuff, 1965,
1967). The total empathic response appears to consist of affective, cognitive, and
communication components. The truly empathic individual appears to possesses the
ability to respond with all three: 1) the ability to allow the self to experience or merge
in the experience of another; 2) the interpretation of one’s own judgments of the
experience of the other’s feelings while suspending one’s own feelings; (Keefe, 1976)
and 3) the ability to communicate one’s understanding of the perceived feelings back
to the other (Carkhuff, 1965, 1967).

Zen

There are three Japanese Zen Sects: Soto, Rinzai, and the Obaku (Wienpahl,
1964). The Soto Sect and the Rinzai Sect are the two sects most often studied. The
Soto Sect emphasizes zazen as the sole method of achieving enlightenment.
Enlightenment is acquired as a result of cutting off passions and misconceptions and is
considered the end result of the training of the priests. The Rinzai Sect practices the koan exercise in addition to zazen. Two branches make up this practice: sanzen and zazen (Y. Akishige, 1977). Sanzen is the understanding of the koan (a test of whether one has really attained enlightenment) and takes place face-to-face between a student and a Zen master. The koan is a problem given to the student by a master (Hirai, 1974). The sanzen process is the understanding of the koan given to the master by the student. Enlightenment can only be reached through the use of sanzen and zazen (Y. Akishige, 1977).

**Zen Meditation**

Zen meditation consists of a variety of methods and is used interchangeably with zazen meditation (Maupin, 1962). Generally the aim is to suspend the ordinary flow of thoughts without falling asleep or going into a trance. There are two frequently used objects of concentration: breathing (the simplest and most frequently used); and thinking (thoughts are allowed to come and go). There are generally two distinct main stages in the training. In the first stage, concentration is difficult but becomes easier as it is followed by relaxation and immersion in the self. In the second stage, thoughts are not planned and have no particular direction. The second stage appears to be accompanied by a sense of calmness.

Research indicates that meditation can: 1) "increase a person's capacity to maintain a focus of attention and awareness upon events of the present moment" (Keefe, 1976, p. 13), 2) increase a person's "ability to keep complex cognitive
processes in temporary abeyance" (p. 13), 3) refine the person’s sensitivity to one’s "own feeling responses to another person" (p. 13), and 4) help the person relax and clear the mind for further perceptions.

Evidence suggests that meditation, particularly those techniques from Zen tradition, encourage behaviors that facilitate empathy (Keefe, 1975). Behaviors which are learned in meditation may be "functionally transferred to interpersonal...behavior" (p. 487). One learns to be open to new experience, to direct one’s attention to one’s feelings, and to show facility in cognitively sorting out and labeling feelings" (Keefe, 1976, p. 12). Awareness of the above behaviors appears to be important in empathic responding.

Zen meditation, in theory, enables an individual to experience immediate affective responses without cognitive distortion. (Maupin, 1962). Meditation apparently precipitates an accurate awareness of the immediate inner most parts of one’s psyche (Lesh, 1970) and is a tuning into understanding and awareness while not tuning out sensory input (Keefe, 1975).

Zazen

Zazen is a meditation in which sitting is the foundation (Kapleau, 1989). The back must be straight and a triangle formed with the sitting posture. Inhalations and exhalations are counted while in the zazen posture. The zazen exercise of concentrating on breathing though appearing simple requires attention and
concentration (Keefe, 1979). Thoughts are allowed to come and go without focusing on them (Kapleau, 1989). During zazen meditation, the individual is thought to experience objects and others more objectively through a decrease in cognitive distortions (Maupin, 1962). An individual is then able to focus on improving interpersonal relationships.

Zazen meditation is a way to learn to control and be aware of the basic primary internal processes (Lesh, 1970). One of these processes is the ability to sense or feel what another is feeling or sensing (affective empathy). The process allows for the suspension of defensiveness or logical functions (Maupin, 1962).

Social learning and individual conflicts produce a filtering system through which only a part of the experience is represented in consciousness (Fromm, 1959). The goal of zazen meditation is to allow all of these conflicts and learned responses to surface to awareness until there is "no cognition, no dreaming, no hallucination, no data input (via normal sensory modalities), no information processing, no conscious activity at all, just full waking attention" (Lesh, 1970, p. 46). Zazen meditation is an attempt to be fully present in the here and now; to be aware and open to experiencing the other as well as the self.

The Japanese Zen Sects train individuals to discipline themselves in order to achieve "enlightenment". The achievement of enlightenment is, in part, through zazen (Zen) meditation. One is enlightened when one understands oneself and others. The
skill of empathy is also to understand oneself and others and is an important part of one's ability to develop supportive interpersonal relationships.

**Independent Variable**

The steps in the zazen (Zen) meditation exercises are the sitting position, structured breathing, and walking meditation. The structured breathing component and the instructions to allow thoughts to come and go without concentrating on these thoughts is hypothesized as helping individuals to learn awareness of thoughts, images, and physiological cues as well as the physical and interpersonal environment without labeling and categorizing (Shapiro, 1978). Awareness of one's feelings and emotions will allow an individual to relate more fully to others (Kasamatsu & Hirari, 1969).

The majority of the studies on the physiological response of zazen (Zen) meditation were conducted in the 1960's and 1970's (e.g. Y. Akishige, 1977; Ikegami, 1977). Recent studies tend to link transcendental meditation to physiological responses rather than zazen (Zen) meditation (e.g. Mills, Schneider, Hill, Walton, & Wallace, 1990; Wallace, Silver, Mills, Dillbeck, & Wagoner, 1983).

**Physiological Studies**

The following physiological studies are organized around the independent variable according to the steps in the training (i.e. the sitting positions, the walking exercise, and the breathing exercises).

The sitting positions presented in the following studies are based on the traditional sitting positions in the formal practice of zazen (Zen) meditation (e.g. legs
crossed over each other while sitting on the floor). The importance of the sitting position in zazen (Zen) meditation is the formation of a triangle with the legs and feet in order to provide balance and stability so that an individual can be relaxed but alert. The same kind of balance and stability may be obtained while sitting in a chair (e.g. Kondo, 1958). The current study presents sitting in a chair with the legs crossed underneath (informal zazen) (Weinpaul, 1964).

**Sitting positions.** A study of the postures in meditation were conducted by Ikegami (1977). Five experiments were undertaken. Experiment I compares various sitting postures; experiment II compares several postures of the Zen practitioner and a layman; experiment III compares different ages and different degrees of proficiency accompanied by a suggestion that "a certain mental factor may interfere with endurance in sitting postures" (p.105); and experiments IV and V compared the effects of the mental set on the sitting posture accompanied by the suggestion that a certain "inner force" (p. 106) influences the maintenance of posture. Experimental conditions were controlled in all of the experiments.

In experiment I (a single-subject design) the Zen postures are compared to other sitting postures (Ikegami, 1977). The experimenter attempted to analyze the Zen posture's mechanism and discover the psychological factors underlying its basis.

Seven types of postures were compared: 1) supine posture; 2) agura tense and relaxed (cross-legged posture with the buttocks directly on the floor); 3) hankafuza (only one instep is placed on the opposite thigh; a variation of kekkafuza the posture
of the Buddha or sitting with the legs criss-crossed); 4) seiza, tense and relaxed (the body weighs on the folded legs and the buttocks rest on the heels); and 5) standing posture (Ikegami, 1977). The Zen sitting posture was further analyzed as a schematic diagram of a triangle obtained by plotting three points of the crossed legs.

The following ten major muscles of the body were measured using an EMT: sternocleidomastoideus, trapezius (upper and lower), latissimus dorsi, pectoralis major, obliquus abdominis, biceps femoris, rectus femoris, tibialis anterior, and gastrocnemius (Ikegami, 1977). The muscle recordings were through bipolar surface electrodes, with an ink-writing electroencephalograph with 0.01 as time-constant. The degree of muscle intensity was classified into five grades: (-) almost no activity, (-+) very slight activity, (+) distinct activity, (++) high activity, and (+++) violent activity. The subject was a male undergraduate (age 23). Each posture was positioned three times with the mean values of the three measurements used for the experimental data.

The results are as follows: 1) supine position - almost no activity except M. latissimus dorsi (++), the upper M. trapezius (-+), and M. latissimus dorsi (-+); 2) agura, tense - lower M. trapezius (+++), upper M. trapezius and M. latissimus dorsi (++), and M. biceps femoris (+) (Ikegami, 1977). Almost all muscles in the upper half of the body are active with particular intensity at M. dorsi; 3) agura, relaxed - upper M. trapezius (++), M. dorsi and M. pectoralis major (+), M. sternocleidomastoideus and M. obliquus abdominis (+). The activities of the antagonistic muscles of the neck are active; 4) hankafuza - M. obliquus abdominis and M. latissimus dorsi (++), upper
M. trapezius and M. sternocleidomastoideus (+). The activities of the antagonistic muscles supporting the head are slight; 5) seiza, tense - M. latissimus dorsi and M. sternocleidomastoideus (++) , M. trapezius (+) and M. sternocleidomastoideus (++) .

The antagonistic muscles of the neck show activities; 6) seiza, relaxed - M. latissimus dorsi and M. pectoralis major (++) , upper M. trapezius (+), M. sternocleidomastoideus and M. obliquus abdominis (+-).

Agura tense shows the highest degree of activity (10.5) seiza tense, seiza relaxed and hankafuza (6.0) and agura relaxed (5.5)(Ikegami, 1977). Standing posture was 12.0 and supine posture was 2.0.

The schematic diagrams of the three postures of agura, seiza, and hankafuza were compared (Ikegami, 1977). All diagrams form approximately an isosceles triangle with the hankafuza the nearest in form to the equilateral triangle. The more the schematic form of a posture approximates the equilateral triangle, the more that posture is stable. The hankafuza is considered the most stable form of posture.

The conclusion drawn from this study is that the degree of muscle activity is determined by a certain posture (Ikegami, 1977). The highest degree of muscle activity is that of the standing position and the lowest that of the supine position. The Zen postures approximate somewhere in the middle with neither too much nor too little requirement of muscle tension.
Experiment II was a two-subjects design comparing the patterns of muscle activities between a Zen priest (age 67 - 35 years experience in meditation) to an undergraduate (age 23 - no experience) (Ikegami, 1977).

The subjects were asked to sit on a wooden disc with an equilateral triangle inscribed in the circumference of the disc and the center of gravity calculated and plotted on the triangle diagram (Ikegami, 1977). The measurements were taken every five minutes on the postures of agur, seiza and hankafuza (used interchangeable with kekkafuza) throughout the rest of the experiments with each posture being maintained for 15 to 30 minutes. The measurements were those of EMG’s, respiration and pulse rates. Five muscles were measured because these muscles were the ones thought to play an essential part in determining head-body correlation. The muscles were the right and left M. sternocleidomastoideus, the right and left upper M. trapezius and M. latissimus dorsi. The same scale was used for assessing the intensity of muscle activity as was used in experiment I. Respiration rate was measured using a thermistor and the pulse rate was measured with and EKG lead I.

The center of gravity of the undergraduate showed considerable fluctuations after time but the Zen priest had less fluctuations after time (Ikegami, 1977). The Zen priest’s center of gravity became steady after 10 minutes when in the hankafuza posture and the steadiness continued up to 30 minutes. The Zen priest showed slight decreases in the intensity of muscle activities in either the agura or seiza posture. The
undergraduate's degree of muscle activity showed a slight increase after time and in particular with respect to M. latissimus dorsi. The hankafuza posture's overall muscle activities for the Zen priest and the undergraduate were markedly less than those for the other two postures. The fluctuations in the degree of muscle activity are almost constant except after 15 minutes and 30 minutes from the start for the Zen priest. Most muscles show a remarkable decrease in activity. The pulse and breath rates are unchanged for both subjects (no signs of anxiety).

The hankafuza posture appears to play an important part in the control of the body (Ikegami, 1977). A psychological factor (the priest has more training in controlling thoughts) is suggested by the researcher in the problem of the maintenance of posture due to the differences in the patterns of muscle activities between the Zen priest and the undergraduate.

Experiment III examined the effects of the age and past experience on posture and the fluctuations of the center of gravity (Ikegami, 1977).

The subjects were three junior high school students, three adults, and six Zen priests (Soto Sect) (Ikegami, 1977). The subjects were instructed in the same procedures as the previous study except that the time allotted to each of the three postures was 10 minutes. The Zen priests were asked "to keep the hankafuza posture for 30 minutes and their fluctuations in the center of gravity during the first 10 minutes were compared with those of the other two groups" (p. 118). The subjects
were asked for introspective reports by answering 12 question about the experience. Eight of the questions pertained to the physical part of the experiment and four pertained to the psychological aspects.

The fluctuations in the center of gravity were highest for the hankafuza posture followed by agura and then by seiza for the school boys (Ikegami, 1977). The order is reversed for the adults. The fluctuations of the center of gravity of the Zen priests for agura and seiza are almost the same and for the hankafuza posture the fluctuations are the smallest. There are differences between the Zen priests in the amount of the fluctuation of the center of gravity in the hankafuza posture.

The introspective reports of the schoolboys revealed the degree of painfulness felt were highest for hankafuza, then agura, and seiza (Ikegami, 1977). These results are in agreement with the order of the amount of their fluctuations of the center of gravity. The adults order of painfulness was seiza, hankafuza, and agura. The posture of seiza is identical with the amount of fluctuations of the center of gravity for the adults.

The degree of stability for each kind of posture are in the order of hankafuza, agura and seiza for the Zen priests (Ikegami, 1977). The order was almost reversed for the other two groups although the adults are able to maintain the same posture with more stability than the schoolboys.

Comparing the Zen priests to the adults, the fluctuations in the hankafuza posture are easily understood as the Zen priests are more likely to be accustomed to
this posture (Ikegami, 1977). The Zen priests show less fluctuation or a higher degree of stability than the adults when the expectation is that there would not be differences since the postures of agura and seiza are ones to which adults are accustomed. The fluctuation of the center of gravity in the adults in the hankafuza posture are the smallest.

The results of experiment III indicate that the stability of posture increases with age; the particular sitting posture plays a part in stability even if one is not accustomed to this position; mental stability is tied to the hankafuza posture; and Zen priests show higher degrees of stability with respect to all postures (Ikegami, 1977).

The purpose of experiment IV was to determine the influence of the mental factor suggested in the results of experiment III and to find out the effects of the mental factor on different types of posture when the same posture is maintained for a long period of time (Ikegami, 1977).

The subjects were 5 university students (ages 20 - 24) with no previous experience in meditation (Ikegami, 1977). The posture of seiza, agura, and hankafuza were chosen at random for each subject to exclude order effects between the postures. Each subject was asked to try one session per day over a three-day period. Subjects were also asked to present an introspective report. Subjects were positioned on the disc and were asked to gaze at a red lamp placed from 2 m and 70 cm high off the floor. Postures were maintained for 30 minutes. The center of gravity was obtained at five-minute intervals. Seven different centers of gravity were obtained over the 30 minutes
of a certain posture and then plotted on paper. The total of the fluctuations of the center was the value showing the amount of bodily fluctuation. Respiratory rate over the 30 minutes was recorded with Tatebe's respirometer. Fluctuations of the center of gravity are lowest for the hankafuza posture, the agura and then seiza. These coincide with the results of the adult group in experiment III. Although the fluctuations increased with the duration of a posture, there was no proportionate relation between these two factors. Values of the ratios of respiration patterns (amplitude of abdominal breathing/amplitude of thoracic breathing) were largest with the hankafuza posture which shows that there was a greater degree of abdominal breathing with this posture. The degree of abdominal breathing is greater in the seiza than in the agura posture except in one case. No relationships were found between the introspective reports and the fluctuations of the center of gravity concerning the ease of difficulty the subjects felt as they participated in the various postures.

The decreasing of the bodily fluctuations under the condition of concentrating on a red lamp leads to the conclusion that the stableness of the mental set probably is a factor that contributes to the decrease in the fluctuations of the center of gravity (Ikegami, 1977).

Experiment V which consisted of two experiments (experiment I and experiment II) were "conducted in order to clarify the mechanism of the mental set which participates in the maintenance of a specific posture" (Ikegami, 1977, p. 126).
Subjects were requested to use the hankafuza posture on the same measurement
disc as in the previous studies under the following two conditions: condition I:
concentrate on a red lamp at a distance of 2 m and 70 cm from the floor (presence of
a mental set by concentration on one point), and condition II: with eyes open and free
to move without any restriction (non-existence of a mental set) (Ikegami, 1977). The
sessions were 30 minutes. There were 8 subjects which were male university students
(ages not given with no experience in meditation). The subjects were divided into two
groups (Ikegami, 1977). One group was told to follow the order of condition I and
then II, the other group was instructed in the reverse order to exclude order effects.
All other conditions, times, and measurements were the same as experiment IV.
Electroencephalogram (EEG) measurements were also recorded.

The data first compared the temporal fluctuation of the center of gravity with
respect to condition I and condition II (Ikegami, 1977). The purpose was to determine
the effects of a mental set on the maintenance of a posture. Respiration frequencies
per minute were calculated to find out the changes over time.

The values under condition I are smaller than those under condition II for the
fluctuations of the center of gravity with respect to each subject (Ikegami, 1977). The
ratios of the values for condition I to condition II successively increase. The
respiration rate under condition I after 15 minutes increases, but after time decreases.

Experiment II was focused on the introspective reports of experiment I
(Ikegami, 1977). Sitting in the second-tried session was easier than the first. Two
subjects (A and B) whose ratios of the values of fluctuation of condition I to condition II were different from each other's pattern were asked to repeat the hankafuza posture for seven days; one session each day at about the same hour. The "purpose was to determine the effect of repetition" (p. 129). An introspective report was requested from the subjects.

The bodily fluctuation of each subject shows extreme ups and downs so that a definite tendency in relation to the repeated practice cannot be determined (Ikegami, 1977). The introspective reports indicate that the sitting became easier with the increase in the number of sessions.

Two months after experiment II, an experiment was conducted with subject A (Ikegami, 1977). He was given the instruction "to gaze steadily at one point and to strictly observe the instructed posture (p. 129). The purpose of the instructions were to strengthen his mental set for the posture. The subject participated in one session per day for 8 consecutive days. The values of fluctuations of the center of gravity with respect to the first repeated practice series are significantly smaller (t=2.76, p<.05). The gradient of decrease with respect to the second series shows a clear decline.

Comparing condition I to condition II, condition I shows less fluctuations in the center of gravity than condition II (Ikegami, 1977). This suggests that the stability of the mental set is coincident with the hankafuza posture and that the answers in the introspective report coincided with the values of fluctuation of respective subjects. The mental set of trying to maintain a certain posture is related to the stability of that
posture. Personal differences were observed with respect to the amounts of fluctuations under condition I and II and with respect to the ratios of the values under these conditions. The assumption is that there exists an interrelation between bodily fluctuation and personality.

In experiment II, the repeated practice of the hankafuza posture under the conditions of a strengthened mental set resulted in a significant decrease in bodily fluctuation with the increase in the number of sessions supports the assumption that mental set has a definite effect on the maintenance of body posture and the two are closely related to each other (Ikegami, 1977). The researcher further interprets this relationship as a two-way feedback phenomenon between the bodily posture and the mental set. When the hankafuza posture is maintained for a long time or where it is repeatedly practiced for a number of days, the physical factors gradually disappear from the surface giving way to an inner, mental factor.

Sato (1977) examined respiration in three postures of zazen; sitting in the kekkafuza or hankafuza posture; sitting still on a chair (practiced in informal zazen meditation); and sitting relaxed in a chair.

Subjects were five male students (ages 22 - 24; no experience); five male students (ages 24 - 27; one year experience or more); and five Zen monks (ages 24 - 28; five years experience or more) (Sato, 1977). Microvibration was picked up by an electrode at the fingertip (to measure respiration) and was recorded through an EEG machine. Each subject was measured in sitting relaxed in a chair, eyes slightly open;
sitting in a chair in a form similar to zazen postures, eyes kept slightly open; and sitting in zazen postures (kekkafuza or hankafuza), eyes kept slightly open.

No significant differences were observed between sitting relaxed or sitting in a chair (Sato, 1977). In the inexperienced group, appearance in alpha band is markedly increased in the zazen posture compared to sitting relaxed in a chair. The inexperienced group’s alpha waves shows a trend of sharp waves while the experts show a trend of slow waves. The inexperienced group showed a greater increase of amplitude in zazen posture than in sitting relaxed while the expert’s amplitude decreased.

**Walking exercise.** Tomura (1977) studied the walking exercise during zazen meditation. The importance of the five minutes of walking in a precise manner is understood to harmonize and unify posture, breathing and the mental condition.

Subjects for the experimental group (E) were six males (ages 24 - 26; five-to-eight years of experience with zazen meditation (Tomura, 1977). Subjects for the control group (C) were six graduate students (ages 23 - 26; no experience or very little experience).

The electroencephalometer was used to record the parietal and occipital regions (Tomura, 1977). Respiration curves were recorded by the copper sulfate electrode. Subjects practiced walking around for five minutes, zazen meditation for 15 minutes, and then walking around for five minutes. Measurements were taken three minutes after one minute (to eliminate any fluctuations in the apparatus) from the first walking
around (K1), three minutes after one minute from the beginning of meditation (Z1), three minutes after 11 minutes from the beginning of meditation (Z2), and three minutes after one minute from the beginning of the second walking around (K2). "The appearance rate of brain waves to all alpha waves in the five bands of the analysis apparatus and the average frequency of the respiration per minute were calculated respectively" (p. 144).

The changes of brain waves of the experimental group during meditation were the appearance of alpha waves (<50%) with an increase of amplitudes and periodic time (Tomura, 1977). The same tendencies were observed in K1 and K2. The appearance of alpha waves of the control group was less remarkable (30-40%) than that of the experimental group. During K1 and K2 the alpha waves were entirely blocked in the control group (p<.001). In all subjects, the respiration decreased remarkably during all conditions.

Breathing exercises. Functioning normally in daily life produces a breath rate of about 18 times a minute and this type of breathing is mostly thoracic (Hirai, 1978). Before zazen (Zen) meditation begins and following the completion meditation this breathing pattern exists. The breathing rate of Zen priests following meditation is sometimes slightly faster than normal for a short period of time. When the mind is at rest, breathing tends to be abdominal rather than thoracic. Meditation produces a deceleration of the breathing rate and abdominal breathing predominates. The more experienced the Zen priest, the slower the breathing rate, at times reaching a level of
four to five breaths a minute. The breath rate "does not mean hypoventilation" (p. 115). During meditation the length of inhalation decreases on the average while the length of exhalation increases on the average (Matsumato, 1977). The breathing exercises in zazen (Zen) meditation, in general, produces an increased efficiency of oxygen and carbon-dioxide exchange (Hirai, 1978).

A study was conducted to study the respiration in zazen (Zen) meditation between a Zen master and Zen monks (Matsumato, 1977). Subjects were a Zen master and seven Zen monks from a Rinzai Sect (experienced for five - 50 years) and a Zen master and three Zen monks from a Soto Sect (experienced in meditation for five - 30 years). The measuring device was the Tatebe Oscillograph. Recordings of the respiration of each of the subjects were taken for quiet sitting for 30 minutes and then in meditation for 30 minutes. Respiration was recorded and examined every five minutes. The mean values of respiratory rate, period of respiration, and time of expiration and inspiration were obtained. The standard deviation and the coefficient of variation of respiration period were computed. The respiratory rates of the subjects were extremely small in both quiet sitting and meditation conditions as compared to an average adult (about 0.43).

Respiratory volume and the depth of respiration in rest and in zazen (Zen) meditation were explored in the next study (Matsumato, 1977). Subjects were three Zen masters and three monks from the Soto Sect (no ages or experience given). The measuring device was the Fukuda Metabolimeter.
Respiration was measured at rest for five minutes and in meditation for five minutes, 10 minutes after the start of meditation (Matsomato, 1977). Inspiration is about five seconds, expiration is about 10 seconds, and this is constant throughout meditation. Volume of respiration is large, 0.8 - 1.1 on the average and volume of ventilation decreases to 3.5 - 4.5L/minutes and remains stable throughout meditation.

The respiratory rate and the minute respiratory volume were smaller in meditation than at rest (Matsomato, 1977). The depth of respiration was larger in meditation than at rest. The results indicate that all of the subjects were breathing more slowly and deeply in meditation than at rest and that the respiratory volume is smaller.

Respiration is examined in the next study by looking at the movement of the diaphragm in respiration control during zazen (Zen) meditation (Matsomato, 1977). Subjects were a Zen monk of the Rinzai Sect (59 years old, 35 years of experience) and an adult with no experience as a control (age not given). Movements of the thoracic and abdominal respirations in meditation were recorded by using the Tatebe Oscillograph and the movements of the diaphragm during meditation were recorded using X-ray photographs in a series of one - 1.5 minutes.

The inexperienced subject's thoracic respiratory movement was about twice as large as that of the abdominal respiratory movement (Matsomato, 1977). The inexperienced subject's respiratory rate was about 19 while the experienced subject's was about four. The difference between the subject's respiratory pattern is represented
in the diaphragm movements. The diaphragm movement of the inexperienced subject is small (the fall of the diaphragm (inspiration) is about 1.3 seconds and the rise (expiration) about 1.8 seconds). The diaphragm movements of the experienced subjects's fall is about three seconds and the rise about 12 seconds.

The large fall and rise of the diaphragm appears to have an effect on the internal organs and on the mental state (Matsomato, 1977). The fall of the diaphragm will reduce intrathoracic pressure and assist with the return of the venous blood to the heart and the flow of the blood in the abdominal cavity into the thorax. The large rise in the diaphragm will help the heart pump and will allow the flow of blood to the cerebrum, the internal organs and the extremities to increase.

Changes in respiratory functions were studied before, during and after zazen (Zen) meditation in five monks (ages 45 - 60; Soto Sect) in a number of single-subject designs (Hirai, 1974). Students of Zen were also investigated in respiratory changes but these results are only mentioned in comparison to those of the five monks. Galvanic Skin Response (GSR) and a respiration apparatus was used. The tidal volume (volume moved in or out during quiet breathing) and oxygen consumption were measured using the basic metabolic rate. The accumulated respiratory gas during meditation was analyzed using a method of gas analysis and the metabolic rates were calculated. The student findings were analyzed and the same experiments were performed for these five monks (control subjects).
Design I - A Zen monk (age 45; experience 22 years) was measured for respiration rates before, after, and during meditation (Hirai, 1974). Before meditation respiratory rate and pattern are normal. The respiratory rate decreases rapidly (about four times per minute; this is lower than waking state or sleep) at the start of meditation and remains fairly stable throughout the meditative state. At the end of the meditation period, the respiratory rate increases and reaches 20 to 22 breaths per minute (faster than before meditation) for about two to three minutes.

Design II - Subject is a Zen monk (57 years; 30 years experience) (Hirai, 1974). At the time of respiratory rate decrease during meditation, the tidal volume increases to a fairly constant level for about 30 minutes of meditation. After meditation, the tidal volume returns to normal instantly. The rate of the decrease in oxygen consumption is from 20% to 30% of normal oxygen consumption.

Design III - Energy metabolism was measured during Zen meditation. A basic metabolic rate was computed (Hirai, 1974). During meditation the experienced subjects showed a decrease in energy metabolism. In order to determine if the decrease in energy metabolism was due to a decrease in respiration, subjects were asked to perform forced reduction in respiratory rate as a control experiment. The subjects were asked to breathe in accordance with metronome rhythms and during each force reduction of the respiratory rate for five minutes, energy metabolism was measured.

The results show that at the normal respiratory rate of 18 breaths per minute, energy metabolism is 1.58 (Hirai, 1974). “When the respiratory rate is reduced by five
in accordance with the metronome rhythms, the energy metabolism becomes 1.26" (p.73). When the respiratory rate is reduced to three breaths per minute, the energy metabolism is higher than the average rate (1.34) and is much higher than the basic metabolic rate. These results are not different from two breaths per minute (1.39) in the forced reduction experiment. The decrease of energy metabolism during meditation is not explained by the decrease in the rate of respiration. An additional amount of energy is required for maintaining the Zen sitting posture, why then would a decrease in metabolism occur? There may be a decrease of energy metabolism in the brain.

The changes in heart rate and respiration during zazen (Zen) meditation were studied by Ando (1977). The purpose of the experiment was to "measure the changes of heart rate (HR) and respiration during meditation as an index of the state of the autonomic nervous system which is so closely dependent upon the emotions, and so to elucidate the mind-body state itself" (p. 180). Subjects were seven Zen monks of the Soto Sect (no ages given - experience three - 28 years). Data was obtained during waking rest before meditation for five minutes and during meditation for 30 minutes.

Respiration was measured using a gum-tube electrode filled with CuSO4 (Ando, 1977). The difference of respiratory rate between resting and meditation was significant at the .01 level. The heart rate increased slightly in meditation. The results suggest that the since the respiratory rate is stable and the decrease of energy metabolism occurs simultaneously with cardiac acceleration, a "dynamic equilibrium is
maintained" (p. 183) between the sympathetic nervous system and the parasympathetic nervous system.

The next study explores how the autonomic nervous system (ANS) is influenced by respiration (Ando, 1977). A single subject design was used and respiration was measured every day for one month as follows: measurements were taken at rest-periods before and after respiration control for four minutes and in respiration control for 11 minutes. Tests were conducted four times every other week.

The hankafuza posture was assumed with deep expiration three times, next concentration was on expiration, expiring slowly and smoothly, counting respirations, followed by inspiration normally (Ando, 1977). The expiration was the tension phase and inspiration was the relaxation phase.

The instrument used for measurement was the Sanei biophysiography (Ando, 1977). Finger pulse volume was measured by the reflection photoelectric plethysmography from the second finger of the left hand with care taken that pressure on the finger was constant. The GSR was measured from the left palm and left forearm by means of the potential method. Respiration was measured from the abdomen by the CuSO4 gum-tube electrode. "The time constant of these indexes was 1.5 seconds" (p. 198).

The subjective reports of the subject were that he was able to concentrate on the breathing in spite of reoccurring images and that he had a feeling of mental stability (Ando, 1977).
Results suggest that the repetitive tension and relaxation in the second session stimulated the ANS resulting in the increased appearance of the GSR and in the increase of finger pulse volume amplitude (Ando, 1977). The GSR almost disappeared at the return to rest and the finger pulse volume amplitude decreased remarkably. Speculations are that the different breathing patterns caused the responses of the finger pulse volume and the responses of the GSR.

Majima (1977) studied respiration (counting respirations as in the current study) and mind regulation (the definition is not clear but appears to be related to the exercise of allowing thoughts to come and go during the practice of zazen (Zen) meditation). Subjects were five males (ages 20 - 21, no experience); five postgraduate students (ages 24 - 27, two - five years of experience); and five males (ages 28 - 36, five - 15 years of experience).

The electroencephalograph was used on the occipital area of the brain (Majima, 1977). The respiratory cycle was recorded with a strain gauge belt around the abdomen of the subjects. The period of respiration was reduced to 20 minutes as the inexperienced subjects found 30 minutes too long for an attention span. After a three minute resting period, meditation using mind regulation and breath counting was done for 20 minutes each. Respiration and occipital EEG alpha rhythms were examined during the 20 minute meditations at the 1st (I), 5th (II), 12th (III), and 17th (IV) minutes. "The
deviation of respiratory time is obtained by subtracting the mean respiratory time on
the trial from each respiratory time" (p. 335).

The deviation of respiratory time was less for the breath counting than the
mind regulation for the experts (Majima, 1977). The deviation of respiratory time was
less for the breath counting than for the mind regulation with the inexperienced but it
was not significant. Breath counting had a higher percentage of alpha rhythm
appearance than did mind regulation. The results suggest that the expert is able to
coordinate expiratory control (concentrated attention on counting) and respiratory
movement (Majima, 1977). Breath counting was increasing highly and continuing into
the latter half compared to mind control. When the maximum and minimum deviations
were compared to the percentage of alpha rhythm appearance, the relation between the
minimum deviation and the higher percentage of alpha rhythm appearances was found
significant in both the expert and the beginner at the 0.05 and 0.01 levels.

Brain waves are indications of the condition of the brain (Hirai, 1978). A brief
explanation about brain waves is presented prior to presenting the studies on zazen
(Zen) meditation and brain waves. When the brain is in a state of tension, it emits beta
waves and in extreme tension, gamma waves. When the brain is in a state of "relaxed
calm" (p. 33), it emits alpha waves. In states of complete rest, the brain emits theta or
delta waves.

The EEG recorded brain waves of Zen monks before, during and after
meditation with open eyes (zazen (Zen) meditation is be performed with eyes opened)
The recording electrodes were "applied to the frontal, parietal and occipital regions in the middle line of the head" (p. 14). The pulse rate, respiration, and GSR were polygraphically recorded. The subjects were 48 Zen monks from the Soto and Rinzai Sects (ages 40 - 52; 22 - 55 years of experience). The control subjects were 15 healthy men (ages 50 - 55; no experience). Recordings were also made with 98 Zen disciples, under the guidance of the Zen monks (the 48 subjects above). The disciples were grouped according to their experience in meditation as follows: Group I: one-five years experience (42 disciples); Group II: six - 10 years experience (31 disciples); and Group III: 11 - 15 years experience (25 disciples). Group IV is the initial 48 Zen monks above).

Experiment I - EEG changes were of a Zen monk from Group IV (age 52; 20 years of experience) (Hirai, 1974). Before beginning meditation, the beta pattern predominates. After meditation begins, alpha waves appear within 50 seconds in all regions and continue for several minutes. After eight minutes and 20 seconds, the amplitude of the alpha waves become larger predominantly in the frontal and central regions. These alpha waves alternated with short runs of beta waves but a stable period of alpha waves was maintained as meditation progressed. After 27 minutes and 10 seconds, rhythmical waves of 7 - 8 seconds appeared for one to two seconds. Twenty seconds later rhythmical theta trains appear and persist for 3.5 seconds. "The theta train is different from the theta waves which appear in a drowsy state" (p. 20). In the drowsy state a click stimulation produces an arousal of alpha waves where a click
stimulation in meditation produces a blocking of the theta waves or produces large, slow alpha waves. The theta waves in meditation have a rhythmical sequence persisting longer and are mixed with regular alpha waves. After meditation, the alpha waves persist for about two minutes (an after-effect of meditation).

A control subject’s (52 years of age) EEG was measured during zazen (Zen) meditation (Hirai, 1974). The EEG did not change over time and showed predominantly beta waves. Another control subject’s (60 years of age) EEG was measured during meditation and also showed predominantly beta waves with short runs of small alpha waves. The evidence suggests that the aging process probably does not influence EEG changes during meditation.

The measurement of another Zen monk’s (no age or experience given) parietal EEG demonstrated small amounts of alpha waves (Hirai, 1974). The amounts of alpha and theta waves were calculated (using the calculation of amplitude of theta and alpha bands with the lapse of time). At the same time the GSR, respiration, and heart rate were calculated. The amount of alpha and theta waves becomes greater as the respiratory rate decreases. The GSR increases and the heart rate becomes faster. After meditation started, alpha waves increased. As respiration slowed, the heart rate increased. During the EEG changes (same as the first experiment), a click stimulation was presented. The stimulation caused a peak fluctuation in the GSR reading. Immediately after the fluctuation, a second peak occurred spontaneously within three seconds after the first and was actually on top of the first response. A response to
stimuli in GSR takes from two to six seconds to appear. The superimposition of the GSR fluctuations lasted about 10 seconds. The increase of alpha waves brings an easily-provoked state of the GSR.

The results suggest a lowered operation of the brain and a heightened activity of an undetermined function of the autonomic nervous system or of the brain (Hirai, 1974).

Groups I, II, and III were examined by the same methods during meditation (Hirai, 1974). Changes in EEG's were observed all day long for a one week period. Some subjects showed no changes in EEG during meditation and others showed the EEG changes already mentioned. In some subjects the pattern was different on different days (i.e. alpha waves were not observable for a long time and on other days the typical meditation pattern occurred).

Yamaoka (1977) studied EEG's of beginners (time spent in zazen (Zen) meditation not reported). All EEG records were obtained from scalp electrodes placed over the frontal, parietal, and the occipital areas of the subjects.

Subjects were asked to meditate with eyes opened and in the posture of hankafuza (Yamaoka, 1977). Several subjects obtained the appearance of alpha rhythms after 10 minutes and then as meditation progressed the voltage of alpha rhythm increased and their period lengthened.

One subject's (24 years old) frontal and parietal areas were investigated during zazen (Zen) meditation (Yamaoka, 1977). Immediately after beginning meditation,
theta rhythms of low voltage appeared but after a few minutes alpha rhythm appeared and the voltage (100uv) and duration of these increased.

Doi (1977) conducted an experiment to determine if alpha waves predominate in the left or right hemisphere of the brain during zazen (Zen) meditation. Subjects were graduate students (ages 23 - 39 years old; one-to-two years experience).

Subjects were asked to meditate for 25 minutes after a rest period of three minutes (Doi, 1977). At the time of rest and in meditation, EEGs were recorded from the bilateral parietal lobe and frontal lobe. EEGs were recorded from the parietal lobe for the following periods: last minute at the rest time, one minute immediately after beginning meditation, one minute following eight and 16 minutes after the beginning of meditation, and the last one minute at the time of meditation.

The alpha band (eight - 13Hz) was more predominant on the right side immediately after beginning meditation than in the time of rest (Doi, 1977). After eight minutes of beginning meditation, the alpha band was predominant on the left side. No difference was found in the predominance of alpha band at 16 minutes after beginning meditation and the last one minute of meditation. The delta band tended to be a little more predominant on the right side during meditation than at the resting period. Beta band one (13 - 20Hz) was more predominant on the right side during meditation than during rest. Beta band two (20 - 30Hz) tended to be more predominant on the left side during meditation than during rest. The theta band (4 - 8Hz) exhibited the same change as the Beta two band although indistinctly.
During meditation a click stimulation was given when a rhythmical theta train appeared, the train was blocked by the stimulation, and then reappeared spontaneously after several seconds (Doi, 1977). The alpha arousal reaction brought on by the stimulation in the drowsy pattern is not observed in meditation but rather the reverse phenomenon (blocking reaction) is seen. The rhythmical theta trains in meditation also have alpha activity which is similar to the waking alpha rhythm, as already mentioned.

The results suggest that the nonverbal functions may be enhanced only after at least eight minutes into meditation (Doi, 1977).

At the stage of the long and persistent alpha wave of a Zen master, a click stimulation was performed in another study (Kasamatsu & Hirai, 1969). Alpha blocking occurs for two seconds to the first stimulus. At intervals of 15 seconds, the click stimuli are repeated 20 times and the alpha blocking is always observed for two to three seconds. The repetition of the click stimulation results in less alpha blocking time.

The same experiments were performed on three Zen masters and four control subjects (Kasamatsu & Hirai, 1969). The results of the measurements of the alpha blocking time were that in the control subjects, the alpha blocking time decreases rapidly, but in Zen masters, "the alpha blocking time is fairly constant" (p. 220). The results suggest that there is no habituation of alpha blocking during meditation.

Other physiological changes. Doi (1977) studied the effects of zazen (Zen meditation) on the pH of urine. Subjects were five experienced meditators (24 - 27
years old) and five inexperienced graduate students (23 - 31 years old) served as controls. Urine specimens were collected before and after the experimental conditions in both groups. The instruments used in the measurement of the urine were a pH-meter, a glass electrode, a comparative electrode and a temperature-compensating electrode.

Three subjects in the experimental group were asked to meditate for a period of 60 minutes (with a recess of several seconds between 30-minute periods) and two subjects in the experimental group were asked to meditate for 30 minutes (Doi, 1977). The control group was asked to rest on a chair for 25 minutes.

In the experimental group, a decrease in the value of pH was presented in four out of five samples (Doi, 1977). The pH increased in the value in the control group. The decrease in the pH of urine may have been brought on as a result of "compensation of a decrease in the body fluid by the kidney" (p. 236).

The results suggest that meditation induces a shift of the acid-base balance to the acidosis side (Doi, 1977). The shift of the balance to the acidosis side at the time of meditation may have a soothing effect on the body and the mind. Corroborating this suggestion are two studies. One which found that the sensitivity of the cerebral and mesencephalic cortices failed to increase in the case of acidosis when electrically stimulated (Osono, 1931) and another (Sakamoto, 1958) which pointed out the pH of the blood has a higher alkaline content in patients with neurosis than in healthy subjects.
A longitudinal study of zazen (Zen) meditation was conducted on three children for four years (K. Akishige, 1977). The ages of the children at the beginning of the study were eight years (female), seven years (male), and five years (male). The subjects had no experience in meditation prior to the experiments. The experiments were conducted on respiration, brain waves, and GSR over the four years (K. Akishige, 1977).

Ventilation volume per minute, tidal volume, respiratory rate, oxygen consumption, carbon dioxide product and the respiratory quotient were measured in respiration (K. Akishige, 1977). "The subjects wore gas masks which were connected to an electrometabolor" (p. 436). The data was observed in a resting condition before and after meditation and these were compared with the average value obtained in meditation. Data was collected minutes after beginning the rest condition and meditation.

On the two male subjects, generally the results on respiration were almost coincident with those obtained from Zen priests in meditation (K. Akishige, 1977). The respiratory data on one subject was different from that of Zen priests. The author speculates that this may be due, in part, to the subjects gender (female). Respiration in this subject was by costal breathing rather than by abdominal breathing.

Beta waves decreased in meditation, similar to results obtained from adults (K. Akishige, 1977). Theta waves remarkably increased and alpha waves slightly
increased. Alpha waves tended to increase following the experience in meditation in adults, but the levels of the children were different.

"The data during the four years does not always show a fixed tendency of development in accordance with the chronological ages" (K. Akishige, 1977, p. 455). The results indicate that there is a question as to whether or not the effects of meditation are similar to those in adults.

The GSR measurements varied in each subject (K. Akishige, 1977). The female subject began the study with high skin resistance with a slight increase the next year and no increase in the following years. The older male subject had skin resistance which remained at a baseline level, decreased the following year, increased the next year and then greatly increased the following year. The youngest male subject had skin resistance which decreased the first year, increased until 5 minutes after beginning of meditation and then decreased gradually, and then decreased the following two years.

Cannon (1939) stated that science would discover two divisions in the nervous system. One system would act outwardly affecting the world around us (sympathetic nervous system). An increase in stress and emotion produces predominance of the sympathetic nervous system (flight or fight syndrome) and is manifested by increased oxygen consumption, pulse rate and blood pressure, and hyperventilation (Hirai, 1974). The other system would act inwardly and would preserve a steady condition within the body (parasympathetic nervous system) (Cannon, 1939). Zen (zazen) meditation produces many bodily changes thought to be impossible with voluntary control, such
as decreased respiratory rate, decreased energy metabolism and increased GSR (Hirai, 1974).

Psychological Studies

The psychological studies focus primarily on the combination of physiological responses and subjective perceptions as these relate to zazen (Zen) meditation.

Chihara (1977) studied time estimation during zazen (Zen) meditation. Subjects were six male graduate students (ages 23 - 27; beginners in meditation, experience not given). The EEG was used and brain waves were measured with the eyes open. Respiration was measured with a copper sulfate rubber tube electrode attached to the abdomen. Time estimations were recorded as each subject pushed a reaction button on EEG recording sheets.

Three different conditions were tried: 10 minutes normal respiration, 10 minutes slow respiration, and five minutes moderately hastened respiration in a seated posture and all in a different order (Chihara, 1977). Resting between conditions was three minutes. "Time estimation was conducted four times respectively, under three conditions, every two minutes under normal and slow respiration and every one minute under hastened respiration" (p. 380). Each condition began with an auditory signal by the experimenter.

The percentage of alpha waves increased and time was reported to be underestimated during slow respiration with a decreased respiration rate (Chihara,
The percentage of alpha brain waves decreased and time was overestimated during hastened respiration.

The results suggest that slow respiration leads to under-estimation of time during meditation and to inhibition of psychological and physiological excitement (Chihara, 1977).

Breathing patterns and rates were studied in subjects with psychological and somatic disorders (Fried, 1987). The breathing patterns and rates resemble those reported by zazen (Zen) meditation practitioners.

The subjects were 15 men and 35 women (ages 25 - 69) (Fried, 1987). The subjects were in treatment for "muscle tension, anxiety, panic disorder and agoraphobia, Raynaud's disease, cardiac arrhythmias, migraine headaches, hypertension, irritable bowel syndrome, hyperventilation, and chronic tiredness" (p. 274).

A P. K. Morgan infrared gas analyzer was used to measure end-tidal carbon dioxide (PETCO2) and EEG's were from the F3-C3 and C3-P3 sites (Fried, 1987). The measurements were taken before training and after the first three two-minute training trials (session one). The percentage of ETCO2, EEG (four consecutive 15-second samples averaged together), thoracic and abdominal breathing modes, and the temperature of the right index finger were made during a 10-minute pretraining evaluation.
The subjects were asked during the first breathing test to close their eyes and to take one to two breaths and then open their eyes (Fried, 1987). The subjects were told during a second breathing test, to open their eyes, inhale, count to two, exhale and count to two, once. During the breathing training, "a book is placed against the seated subject's abdomen and he/she is told to look at the book and to breathe so that the book is displaced outward by inspiration and inward by expiration" (p. 275). After three to five breaths, the subjects were given guided imagery instructions in which they were to imagine their breaths were coordinated with an ocean surf rolling in and out. Subjects were instructed to see the surf rolling in when inspiration began and to see the surf rolling out when expiration began. The training trial lasted two minutes followed by five minutes of rest. Three trials were held in each training session.

Two sets of data are reported (Fried, 1977). Comparisons were made of breathing rates and the PETCO2 and the EEG data of four subjects who experienced altered awareness. The breathing rates before training were significantly different from those of the third training trial (F(1,49) = 2.79, p < .05). The PETCO2 values before training differ significantly from those on the last training trial (F(1,49) = 1.56, p > .05; t(98) = 2.47, p < .05).

Two men and two women reported a change in awareness (Fried, 1977). Before training the theta was elevated relative to alpha. After training, an overall decrease in "EEG baseline-voltage, coherent alpha, elevated relative to theta" (p. 276) occurred.
The results are similar to those reported in the zazen (Zen) meditation (Fried, 1977). The breathing rate and PETCO2 was lowered. In hyperventilating subjects, the lowered breathing rate increased PETCO2. A decrease in PETCO2 can only result from hypoarousal.

The results suggest that a metabolic hypoarousal and EEG patterns occur similar to those of Zen practitioners in response to deep-diaphragmatic breathing with surf imagery (Fried, 1977).

The physiological and subjective effects of zazen (Zen) meditation were studied under four treatment conditions (Malex & Sipprelle, 1977). Electromyogram (EMG) was recorded from the frontalis with a Feedback Myograph and a Time-Period Integrator. GSR was measured with a Dual Limit GSR unit and counted by a Data Recorder. Heart and respiration rates were recorded on a Gilson polygraph. The subjects completed the Mehrabian-Russell Mood Scale (no reference given) after each time period and wrote a verbal description of their feelings after the completion of the treatment.

Forty male undergraduate volunteers were the subjects. The treatment period was 15 minutes preceded by a 15 minute baseline period and a 15 minute recovery period (Malex & Sipprelle, 1977). During the treatment three groups were asked to meditate after viewing a videotape demonstration of the zazen (Zen) meditation exercise for counting breaths. The "deactivation demand" treatment group was given the suggestion that they would have a relaxation outcome, the "neutral demand"
treatment group was given the suggestion that they would have no specific outcome, and the "activation demand" group was given the suggestion that they would have an arousal outcome. The control group was asked to "just sit there" (p. 339).

Respiration rate during treatment periods was lower for the combined meditation groups than for the control group (F(4.35) = 8.55, p < .05. Scheffe's test) (Malex & Sipprelle, 1977). The average heart rate increased at the beginning of the treatment period and then gradually decreased. The effects were not significant. EMG was lower for the combined meditation groups than for the control group (F(1.37) = 6.31, p < .05). The GSR data was not significant. "The mood scale sampled three factors: pleasantness, activation, and dominance" (p. 339). Pleasantness decreased across all periods in the treatment groups (F(2.35) = 3.58, p < .05), activation increased (F(2.35) = 7.00 p < .005), and dominance was lower after the treatment period than after the other periods (F(2.35) = 7.60, p < .005). The self-reports were ranked on the dimensions from the mood scale with nonparametric tests and there were no significant effects.

The results suggest that the meditation produced lowered respiration rate and muscle tension independent of the type of demand (suggestion) (Malex & Sipprelle, 1977). Respiration volume was not measured in this study and could have confounded the heart-rate results.
A pilot study was conducted to conceptualize "certain responses, or human abilities" (Shapiro, 1978, p. 19) and to assess empirically the specific behavioral effects of zazen (Zen) Meditation on these human abilities.

Subjects were 15 undergraduate students with no experience in Zen meditation (Shapiro, 1978). The subjects were randomly assigned to an experimental (N=8) and a control group (N=7). The definitions of nine behaviors were provided to the subjects and they were asked to operationalize these behaviors further based on their own experiences. The nine behaviors were: "positive self-statements, negative self-statements, feelings of creativity, feelings of self-control, feelings of anxiety, becoming angry, noting positive things in nature, relating to only part of a person, and not living in the here and now" (p. 23).

The experimental group attended a weekend Zen experience workshop (which involved a variety of exercises, including breathing exercises) after they observed and recorded their nine behaviors on data charts for two weeks (Shapiro, 1978). For three weeks the experimental group meditated formally twice a day and continued to observe and record the nine behaviors. The control group received no intervention and only recorded and charted the nine behaviors for the five-week period.

Three tests were given pretest and posttest: Semantic Differential for Self Conception (Osgood, Suci, & Tannenbaum, 1957); questions from the multidimensional Internal-External Control Scale (Rotter, 1982; Gurin & Gurin, 1969); and
the Stanford Hypnotic Susceptibility Scale, Form C, Group Variant (no reference given).

Only two of the nine variables were significant: feelings of creativity (Wilcoxon rank sum test, p < .05) and relating to only part of a person (Wilcoxon rank sum test, p = .01) (Shapiro, 1978). The scores on the pretest/posttest measures were not significant although the change in means was in the hypothesized direction (i.e. an increase in hypnotic susceptibility, increase in feelings of personal self-control, and movement towards creativity, calmness, friendly and high in self-confidence).

The results suggest that some variables were more susceptible to Zen meditation than others (Shapiro, 1978). The significant changes were in the feelings of creativity and relating to only a part of a person. The latter variable is of interest to the present study as the hypothesis is that the increase in this variable helps an individual relate more fully to other people in their existential wholeness without being bound by conventional labels (Lesh, 1970).

Two concentration methods: Zen meditation and cotention training compared some of the psychological and psychophysiological effects in short-term training with inexperienced subjects (Goyeche, Chihara, & Shimizu, 1972). Cotention is defined as attention that is free from affect and socially disruptive elements (Burrow & Galt, 1945). Cotention drops energy output and tends to eliminate "the bias of affect from the process of attention" (p. 287).
All eight male undergraduates participated in a 15-minute concentration session, five minutes devoted to meditation, five to cotention, and five to relaxation (Goyeche et al., 1972). "The order of treatment was randomly assigned to each subject" (p. 110). The abdominal and thoracic respiration rate, horizontal biocular eye movements, and heart rate were recorded.

Subjects were asked to provide written input into which method was easier, which method felt better, why concentration might have been difficult, and estimate the elapse of time (Goyeche et al., 1972).

Subjects were asked to concentrate attention on muscles sensations arising from abdominal breathing during meditation and to concentrate their attention on the muscle sensations of the eyes during cotention. Subjects were asked to just relax during the relaxation time.

The results were not statistically analyzed due to the small number of subjects and because this was a pilot study (Goyeche et al., 1972). The concentration was during meditations was "easier to maintain, produced greater feelings of well-being, and more greatly lengthened the perception of time, when compared with cotentive concentration" (p. 111). The respiration and heart rate decreased during Zen meditation and the amplitude of abdominal breathing increased while that of the thorax decreased. Both techniques tended to produce a decrease in eye movements.

The results suggest that meditation may produce long-term modifications of human concentration capacity (Goyeche et al., 1972). The psychophysiological effects
of zazen (Zen) meditation agree with those reported by other investigators except for
the decrease in heart rate and a surprising finding of sinus arrhythmia. The authors
speculate that the sinus arrhythmia is suggestive of better autonomic system harmony
and regression (Goyeche et al., 1972).

A one-subject design studied zazen (Zen) meditation and behavioral self-control
on a case of generalized anxiety (Shapiro, 1976). The subject was a female
undergraduate complaining of free-floating anxiety.

The subject was given a wrist-counter and told to click the counter when
feeling anxious (i.e. specific physical cues such as stomach butterflies and verbal
messages such as "I'm feeling nervous") (Shapiro, 1976). After monitoring anxiety for
two weeks, the subject attended a weekend workshop on Zen meditation designed to
count breaths. For three weeks following the workshop, the subject was instructed to
meditate for 10 minutes, twice a day, continue monitoring anxiety, and to meditate
when receiving cues that she was anxious.

The median slope procedure was used for the statistical analysis (Shapiro,
1976). "The median slope of the baseline phase was 1.2 (increasing) and for the
intervention phase was 1.497 (decreasing). The step between the phases (i.e. the
difference between the last point of the median slope of the baseline phase and the
first point of the median slope of the intervention phase) was 1.037. The progress
change was 1.796. After the intervention, the subject reported herself as calm and
before the intervention, the subject reported herself as anxious."
The results suggest that zazen (Zen) meditation is an intervention strategy in anxiety especially when coupled with meditation contingent upon antecedent cues (Shapiro, 1976).

A similar study to the preceding one involved two subjects (ages 25 and 29) who were long-term heroin users but were undergoing methadone maintenance (Shapiro & Zifferblatt, 1976).

The subjects were taught zazen (Zen) breath meditation and asked to practice 15 minutes, twice a day for one month (Shapiro & Zifferblatt, 1976). The subjects were also taught to monitor overt and covert cues and determine which cues and consequences were involved in drug-taking behavior. Urine samples were collected at random to determine drug usage other than methadone. At a two year follow-up, subject one had remained free of all chemical use including heroin. Subject two remained free of all chemical use including heroin at six months and at a two year follow-up.

Results suggest that zazen (Zen) meditation when used with behavioral self-management may be an intervention which leads to behavioral changes (Shapiro & Zifferblatt, 1976).

Five aspects of personality functioning of "receptive attention, concentration, breadth of attention deployment, tolerance for unrealistic experience, and capacity for adaptive regression were studied (Maupin, 1965).
Subjects were 28 males recruited through an advertisement in a campus newspaper and offered instruction in zazen (Zen) meditation (Maupin, 1965). Subjects were scaled after the meditation training as to their experiences. Forty-five minute sessions were conducted each weekday for a two-week period. The sessions were followed by short interviews to obtain data about their experiences.

Details for the attention measures were not reported (Maupin, 1965). Three measures were used to assess the subjects tolerance for unrealistic experience. Acceptance of the ink blots characterized a tolerant person on the Rorschach Measure (Klein, Gardner, & Schlesinger, 1962). Two raters trained in the use of this system recorded acceptance (Maupin, 1965). A second measure used reversible figures to measure tolerance. The number of reversals during the 30-second presentation added to the total number of reversals for four figures were the scores. The amount of autokinetic movement the subject reported was the third measure of tolerance. Small estimates of movement denote discomfort and intolerance. The capacity for adaptive regression was measured using Holt's (Holt & Havel, 1960) scoring for primary-process thinking on the Rorschach and visual imagery during a free-association time. The subjects responses to meditation were rated high, moderate, and low from verbal reports and compared to the pretests (Maupin, 1965).

Correlations between tolerance for unrealistic experience and capacity for adaptive regression were calculated between the two Rorschach ratings (\(\tau = .18\)) (Maupin, 1965). The primary process and effectiveness of control of the Rorschach
measure was .28, (p < .05). Visual imagery scores correlated with tolerance ratings (tau = .34, p < .01). The overlap between the three measures is not considered by the author to be substantial and therefore concludes that the measures are not measuring the same phenomena.

The results were measured as linear relationships with Kendall's rank-correlation coefficient (Maupin, 1965). A two-tailed probability of .05 was set. The Rorschach measure of tolerance correlated positively with the response to meditation (tau = .37, p < .01). The figure reversals and the autokinetic were not significantly related to the meditation response.

The two measures for the capacity for adaptive regression, primary-process thinking and visual imagery during free association, correlated positively with response to meditation (tau = .49, p < .001 and tau = .35, p < .01, respectively) (Maupin, 1965). Meditation did not correlate as expected with attention functions.

The results suggest that the meditation process may be a sequence of states of regression (Maupin, 1965). Each state develops functions upon which each succeeding state depends. Meditation in the early stages may produce the appearance of primary-processes. "The ability to deal with them in an accepting, undisruptive fashion enables the student to get through to the next stage..." (p. 196). A tolerance for unrealistic experience and a capacity for adaptive regression (i.e. controlling primary processes) appear to predict response to meditation while attention dimensions did not.
A study of the effects that meditation had on school children's levels of field dependence-independence, test anxiety, and reading achievement was conducted (Linden, 1973).

The subjects were third grade school children. There were 15 girls and 15 boys for each of the three treatment conditions (Linden, 1973). The subjects were randomly assigned to one of three groups: a control group (who stayed in the classroom and received no special attention), an experimental group assigned to a guidance group, and an experimental group who were trained in meditation. The second group met with a guidance counselor for 45 minutes once a week for 18 weeks. They received didactic material on developing study skills. The third group met with the experimenter twice a week for 20-25 minutes for 36 meditation training sessions. The meditation exercise was the zazen (Zen) breathing exercises. Discussions were held between exercises about the experiences the subjects were having.

The instrument for measuring field dependence/independence was the Children's Embedded Figures Test (CEFT) and the measure of anxiety was the Test Anxiety Scale for Children (TASC) (Linden, 1973). The measures were given pretest and posttest. The results of reading achievement were not significant and were not reported.

An analysis of covariance showed that the meditation group gained on the measure of field independence and reduced on the measure of test anxiety (Linden,
1973). The posttest differences among the groups on the CEFT ($F = 4.58, p < .05$) and on the TASC ($F = 7.86, p < .01$).

The results suggest that meditation may be a training method for "self-discovery and self-mastery" (Linden, 1973, p. 142).

Dependent Variable

The dependent variable of affective empathy is a response which comprises part of a total (true) empathic response (Keefe, 1979). As a behavioral response, affective empathy is assumed to be a response which may be trained and thus become a skill. The following research selections are focused on the training of the empathic response.

Empathy Training

The studies of empathy review the following areas: 1) affective empathy training 2) empathy training with senior citizens and 3) empathy training using zazen (Zen) meditation. The predominance of earlier studies on empathy training with senior citizens and zazen (Zen) meditation are because the author did not locate studies which might have been undertaken at later dates.

Affective empathy training. A study conducted by Herbek and Yammarino (1990) examined the effectiveness of affective empathy training with hospital staff nurses. The hypothesis was that the experimental group would increase in affective empathy after training as compared to a control group. A measurement for affective empathy (Mehrabian & Epstein, 1972) was used pretest and posttest on both groups one week prior to training and one week after training.
Subjects were nursing units rather than individuals (Herbek & Yammarino, 1990). "Analysis was made prior to training to assess the comparability of the subjects in the experimental and control groups" (p. 284). Five levels of empathic understanding in interpersonal processing were identified in the training method (Carkhuff, 1969). The training program consisted of six one-hour sessions over a seven-week period and was designed to teach nurses empathic responses from lower-level to higher-level responses (Herbek & Yammarino, 1990).

A repeated measures analysis of variance of the empathy scores was used (Herbek & Yammarino, 1990). Various indicators of effect size were computed. The groups were comparable at the beginning of the study (Mc = 55.13, Me = 60.10, t = .82). The posttraining empathy scores were not statistically significant (Mc = 59.56, Me = 70.75, t = 1.50). The posttraining mean for the experimental group (Me = 70.75) differed significantly (t = 1.96, p < .05) from the pretraining control group mean (Mc = 55.13). The point-biserial correlation was .33, p < .05, and Glass's effect size was .66.

The data suggests that any improvement in empathy no matter how small may be effective (Herbek & Yammarino, 1990). A problem in this study may have been that the dependent and independent variables were not orthogonal.

A study of affective and cognitive empathy training with adolescent females addressed the usefulness of empathy training for increasing levels of empathy (Pecukonis, 1990). The theoretical question addressed was whether individuals
considered deficient in empathic abilities may be helped to develop this interpersonal skill.

Subjects were 24 females (ages 14 - 17) who displayed behaviors of aggressive interpersonal adjustment (Pecukonis, 1990). All subjects were pretested on measures of affective and cognitive empathy and ego development. The measure of affective empathy was the Mehrabian and Epstein (1972) scale and the measure for cognitive empathy was the Hogan Empathy Test (1969). A semi-projective measure developed by Loevinger and Wessler (1970) was used to measure the level of ego development. Pearson correlations were computed to evaluate the degree of association between the level of ego development and the pretest levels of affective and cognitive empathy (Pecukonis, 1990).

Subjects were identified as either high or low levels of ego development (Pecukonis, 1990). The 12 subjects identified as high were randomly assigned to either an experimental or control group. The same occurred with the 12 subjects identified as low in levels of ego development. Both groups contained six subjects identified as either high or low in ego development.

The experimental group was exposed to four 1.5 hour training sessions over a 10-week period (Pecukonis, 1990). Four separate training sessions were used. The first training session consisted in subjects identifying the affective states in others. The second session was designed to improve subjects’ role-taking abilities. The third session trained subjects to share and match the emotional reactions of others through
"affect discrimination and role taking" (p. 67). The fourth session incorporated the skills attained in the first three session through objective procedures for observing and inferring causes of behaviors and affective states as they were presented.

A two-factor analysis of covariance analyzed the differences in posttest affective empathy scores (Pecukonis, 1990). Affective empathy increased after training (F(1.15) = 5.765, p < .03. In a separate analysis of covariance in which the affective and cognitive pretest scores are controlled, the increase on the posttest measure of affective empathy for the experimental group continued to be statistically significant (F(1.15) = 3.872, p < .069. A significant main effect for ego development nor a significant interaction between affective empathy and ego development was found. This result suggest that there is no difference between subjects low or high in ego development in their ability to profit from affective empathy training.

The findings for cognitive empathy do not support the hypothesis that empathy training is effective in increasing levels of cognitive empathy (Pecukonis, 1990). A significant main effect for ego development "nor an interaction between this variable and cognitive empathy" (p. 72) was found.

Subjects in the experimental group increased on posttest scores of affective empathy while the control group decreased on the posttest scores (Pecukonis, 1990). Using a separate analysis of covariance, the increase on posttest scores for the experimental group was still statistically significant.
The results of this study suggest that empathy training was effective in increasing the scores of affective empathy after six hours of training but was not effective in increasing the scores of cognitive empathy (Pecukonis, 1990).

**Empathy training with senior citizens.** The effect of empathy training on empathy, self-exploration, and key attitudes using a systematic method on a sample of senior citizens was examined by Isquick (1981). The training program drew from Egan (1975); Gazda, Asbury, Balzer, Childers, Desselle, & Walters (1973); Gazda, Walters, & Childers (1975); Gazda, Asbury, Balzer, Childers, & Walters (1977), and Carkhuff & Pierce (1977).

Twenty eight subjects (ages 52 - 78; four males, 24 females) participated (Isquick, 1981). They were randomly assigned to either the empathy training group, a discussion group, or to a control group. Eight weekly training session were held for a total of 16 hours of training. The training program focused on "learning a rating scale for empathy, rating the empathy of others, and responding empathically" (p. 3). The trainer explained the helping skills, modeled the new behaviors, and provided exercises.

The discussion group met for the same length of time (Isquick, 1981). The presenter provided research findings about aging and then encouraged discussions about the topics with the subjects.

A pretest, posttest, and a posttest four weeks after the training were conducted (Isquick, 1981). The first test was a rating of written responses rating one's ability to
be empathic. The subjects observed and rated the responses of a helper, orally and in writing. The scores of the subjects were calculated as the absolute deviations of the subjects ratings from the pre-ratings of experts. Changes in attitudes were measured using a questionnaire which included the concepts "understanding others and feelings and emotions" (p. 4). Interviews were held with the subjects in which they alternated roles as a helper and an individual seeking help (Isquick, 1981). Two ratings were developed from these interviews. One for the ability to be empathic and the other for self-exploration.

An analysis of covariance showed a significant difference among the groups in their ability to rate empathy (F = 129.5, p < .001) (Isquick, 1981). An analysis of covariance supported the two-factor analysis of variance which found significant effects of Groups (F = 48, p < .001), Time (F = 67.5, p < .001), and Time X Groups (F = 48.75, p < .001). The two-factor analysis of variance showed significant effects on the ability to write empathic responses for Groups (F = 876, p < .001), Time (F = 354.17, p < .001) and Time X Groups (F = 445.83, p < .001). The two-factor analysis of variance indicated significant effects for rating in a helping interview for Groups (F = 96.32, p < .001), Time (F = 32.95, p < .001) and Time X Groups (F = 35.23, p < .001). The two-factor analysis of variance for self-exploration found a significant effect of Time (F = 1.27, p < .005) and Time X Groups (F = 2.92, p < .05). The trend for Groups did not reach the .05 level of significance. The analysis of variance for attitudes revealed no significant effects. The results suggest that senior citizens can be
trained to improve their empathic responses in their abilities to rate the empathy of others, to write empathic responses, and to be empathic in a helping interview.


The experimental group (ages 61 - 79; N=11) received 10 1/2 hour sessions over a 10 week period (Becker & Zarit, 1978). The control group (ages 64 - 75, N=6) received no training. Prior to training, both groups were similar to their levels of responses on all measures.

Two components comprised the training method modeled after Carkuff's (1969) program (Becker & Zarit, 1978). The first component involved learning and practicing skills defined as "accurate empathy, nonpossessive warmth, and genuineness" (p. 244). The second component attempted to free the subjects from stereotypical and mythological thinking about the behaviors and needs of senior citizens. A weekly sensitivity training for 1.5 hours was provided.

The evaluation of skills were devised by having the subjects view two videotapes showing an older male and an older female reading five statements likely to be made by a client (Becker & Zarit, 1978). The tapes were reversed for each group of subjects. Subjects were asked to respond to each statement on tape as they might to a client. "Half of the subjects viewed the male client's tape before training and the female client's after the 10-week course" (p. 244). The tapes of the subjects were blind-rated by nine persons judged to be trained in the ratings. The rating scales were

The changes in scores were obtained from pretraining to posttraining (Becker & Zarit, 1978). The experimental group’s amount of change was significantly greater than for controls on the dimensions of levels of accurate empathy and nonpossessive warmth (15.5 and 13, respectively on the Mann-Whitney U, p < .05). There was no difference in change in the levels of the dimensions of genuineness, acceptance of self and acceptance of others. The changes in scores on empathy (.57) and nonpossessive warmth (.58) and the initial ratings of acceptance of others were significant correlations. The correlation between changes in empathy (.31) and warmth (.49) and acceptance of self were not significant. Genuineness did not correlate with either measure of self acceptance or other acceptance.

The results suggest that senior citizens can be trained in the communication of empathy necessary for interpersonal skill-building (Becker & Zarit, 1978).

Zazen (zen) meditation for empathy training. Keefe (1979) conducted a study of affective empathy training in one of two experimental conditions using a structured meditation experience.

Three groups of subjects consisting of second-year graduate students were studied (Keefe, 1979). The first group (E1) was exposed to a Therapeutic Communication class (didactic and role-playing content) lasting one semester (N=19), the second group (E2) was exposed to a Zen meditation exercise for three weeks
(N=20), and a control group (N=17) (no activity). A third condition included the combined effect of both experimental conditions (E3). The meditation group was posttested after the meditation then they attended the therapeutic communications class after which they were posttested (E3). All groups were pretested on the Affective Sensitivity Scale (Kagan, Krathwohl, & Farguhar, 1965). The groups were posttested on the same scale after the therapeutic communications class (E1, E3, and C) and after the meditation training (E2) (Keefe, 1979). C was posttested after a time corresponding to the length of the class.

The first experimental condition (Therapeutic Communications class) consisted of 1.5 hours per week of didactic content and 1.5 hours per week of experiential learning (Keefe, 1979). The experiential part included a structured role-playing situation in which each subject played the role of a helper and was to provide empathic responses. The subjects were rated as to the level of empathy and then provided examples of how to offer higher levels of empathy. The didactic content emphasized "perception and communication" (p. 32).

The meditation was 1/2 hour daily for three weeks (Keefe, 1979). Kapleau's (1965) zazen training was selected. Subjects sat erect either in a chair or cross-legged and concentrated on their breathing (Keefe, 1979). They were asked to continue concentrating without resisting or attending to thoughts or images. Subjects were asked to write their experiences following each session.
Subjects exposed to the therapeutic communication group increased in empathy in a positive direction but the results were not significant (Keefe, 1979). The meditation group’s change in empathy scores was significant both in the magnitude ($t = 4.937, p < .001$) and direction ($z = 3.06, p < .01$). The magnitude of change ($F = .521, p > .05$) was not significant beyond that of the control group. The follow-up test for the meditation group after exposure to both conditions gave a mean score of 46.55. This mean score is above that of practicing Ph. D. psychologists.

The meditation group’s responses on their experiences were rated and correlated with the degree of pretest-posttest scores (Keefe, 1979). A Spearman Rank Order Correlation Coefficient was used to compare score changes and meditation levels. The purpose was to determine if there was a relationship between empathy and levels of meditation. The mean judged level of meditation (3.96) for each subject correlated positively and significantly with each subject’s pretest/posttest empathy score change ($r's = .407, p < .05$).

The results suggest that meditation increased levels of affective empathy and that there is a relationship between meditation and affective empathy levels (Keefe, 1979).

The purpose of Lesh’s (1970) study was to determine if a relationship existed between the practice of zazen (Zen) meditation and the development of affective empathy in graduate counseling students.
The first group (N=16) was the meditation group (E1) (Lesh, 1970). Group two (N=12) who volunteered to do meditation but decided not to do meditation (C1). Group three (N=11) completed the criterion measures (C2). Randomization was not possible as the students did not want to participate in the meditation part of the experiment. Volunteers were recruited to participate in the meditation. All subjects were given the pretest on the same day at the beginning of the study and the posttest on the same day four weeks later.

The Affective Sensitivity Scale (Kagan, Krathwohl, & Farquhar, 1965) was used to measure affective empathy (sensitivity) (Lesh, 1970). The Experience Inquiry (Fitsgerald, 1966) was used to measure adaptive regression and measured subjects' openness to inner and outer experience. The Personal Orientation Inventory (Shostrom, 1961) measured the subject's degree of self-actualization.

The subjects were given instructions in meditation and asked to practice the breathing exercises for 30 minutes each week day for four weeks (Lesh, 1970). These sessions were regularly scheduled. The subjects were asked to record their experiences after each exercise. These were rated by three judges. These ratings were used to examine correlational relationships with the criterion measures.

The experimental group scores increased on the Affective Sensitivity Scale (ASS) after meditation (Lesh, 1970). The adjustment of means within and between the groups for variability showed a net mean gain of 7.23 (p = .001). A positive correlation between the individual responses to meditation and the scores on the ASS
was not significant. A positive correlation between the subject’s meditation responses and the scores on the Experience Inquiry were significant (tau = .56 at pretest, p = .01 and tau = .412 at posttest, p = .05). The subjects scores in openness to experience to individual scores in ASS was positive ((tau = 2.09 at pretest and tau = .19 at posttest, p < .05). Individuals who scored high on the ASS scored high on the Personal Orientation Inventory in the positive direction (tau = 2.51 at pretest and tau = .19 at posttest, p < .05).

The results suggested that a positive relationship between zazen meditation and affective empathy exists although the relationship is limited (Lesh, 1970). The levels of concentration in meditation did not appear to have any effect on an “increase or decrease in empathic ability” (p. 60). The relationship between openness to experience and affective empathic ability supported the contention that one must be open to oneself in order to be able to sense or feel what another is experiencing. The relationship between self-actualization and empathy indicated that individuals who are more self-actualizing have more empathic understanding.

Meditation appears to have significant effects on the psychological "and interpersonal domains of our experience" (Lesh, 1970, p. 68). The practice of meditation did appear to contribute to an accuracy in detecting and describing the affective states of others. The results suggest that the practice of zazen (Zen) meditation is an effective method in improving affective empathic ability. The experimental group improved significantly in affective empathic skill while the two
control groups did not. The pretest scores of the experimental group were higher than those of the controls due to the selection of individuals who were interested in learning meditation. Although the experimenter adjusted for these differences, conclusive evidence was difficult to determine.

**Summary**

The literature suggests that before a total (true) empathic response occurs, an affective empathic response must first be experienced. The cognitive response which either occurs simultaneously or follows the affective response allows the individual to separate feelings felt as one's own from those felt as belonging to another. The empathic response is completed when understanding is communicated. The individual learns through zazen (Zen) meditation to allow the affective empathic response to resonate and to suspend the cognitive empathic response. The average training time needed for zazen (Zen) meditations to produce significant effects in affective empathy is 15 hours.

The literature review indicates that zazen (Zen) meditation is capable of producing change and will be an effective training method as one means of increasing affective empathy responses in order to increase the level of interpersonal skills. Affective empathy training, as a part of a total training package, may bolster feelings of self-worth as well as provide a tool in interpersonal functioning to senior citizens.
CHAPTER III

Methodology

Chapter three is divided into six sections; subjects, procedures, instrumentation, validity issues, variables, and the delimitations of the variables. The study is a pretest/posttest experimental design with one control group and one experimental group. The section on the subjects provides an overview of the recruitment process, demographics, and the number of available subjects in the area. The procedures are detailed as to how the study was conducted. The instruments used in the study are described and the reliability and validity factors presented. Instrumentation, validity issues, the variables in the study, and the delimitations of the variables are then presented.

Subjects

The total population in the rural area where the study was conducted is 913 individuals between the ages 55 - 64 and 1030 individuals over 65 years of age. The subjects in the study were 19 senior citizens from a rural area in east central Arizona in the Southwestern United States. The subjects were recruited through an advertisement in a local newspaper, through advertisements posted around three communities, and through the verbal announcements at three local senior citizens groups (see Appendix C for a copy of the advertisement). Invitations to participate were not mailed as originally planned since a list of senior citizens was not available.
The subjects in the study ranged in age from 60 - 77 years. The levels of education ranged from the 7th grade to four years of college. Race consisted of 10 Anglos and nine Hispanics; 13 females and six males; Ten of the subjects lived alone, eight lived with a spouse and one lived with a son. All of the subjects stated that they read and understood English well. Four subjects stated that they did not do any physical exercising while 15 stated that they walked consistently (see Table I).

**Procedures**

As announced during the recruitment process, subjects arrived at 8:00 a.m. Monday morning and received a brief overview of the study. Twenty-two subjects participated in the initial briefing. They were told that they were being asked to participate in a study for three hours per day for five consecutive days and informed that they would not be touched in any manner during the study. The subjects were informed at this time that "The purpose of the study is to develop different teaching methods for senior citizens to use in the behavioral health field. The exact nature of the study will be explained at the end of the training so the results will be more accurate. The exercises during the training are not harmful and you may withdraw from the study any time you wish. At the termination of the experiment a meeting will be held to answer any questions regarding the experiment. A number will be assigned to each person in order to protect your identity." Questions were then entertained from the subjects. One subject asked if the study would be such that she would be required to reveal any personal information. She was informed that personal information
consisted of age, occupation, recreational activities, gender, race, information as to her ability to participate in the study, and if she lived alone or with someone else. Another subject asked if she could be informed as to the results of the study and she was told yes that she could obtain the results either from the experimenter or from the University of Arizona library. Three of the subjects elected to not participate further in the study and left.

An informed consent form (see Appendix E) was explained and signed voluntarily by each participant. The subjects were given a demographic questionnaire (see Appendix C). All subjects were found to be physically able to participate in the study based on information gained from the demographic questionnaire. The subjects were randomly assigned to either the experimental group or to the control group by the following procedure. Twenty numbers were selected from a pool of numbers previously selected by the experimenter. Ten numbers ended in the number one and ten ended in the number two. The numbers were randomly drawn and randomly given to each of the subjects. The subjects were given a package of three numbers corresponding to the randomly assigned numbers as outlined above. The package of numbers had adhesive capabilities. The subjects were given the pretest and asked to affix one of their numbers to the pretest and one to their signed consent form. The subjects were asked to retain the last number so that they would have this available to place on the posttest (see Appendix D). If the subject lost the number, their number could be tracked with the signed consent form and placed on the posttest since their
number had been previously placed on the signed consent form. A flip of a coin was used to determine which of the groups would be the experimental group and which would be the control group. The group with the numbers ending in one was the control group and group with the numbers ending in two was the experimental group (as determined by the coin flip). Ten subjects were randomly assigned to the control group and 9 subjects were randomly assigned to the experimental group. The pretest, the Emotional Empathic Tendency (EETS) (Mehrabian & Epstein, 1972) was administered after the instructions were explained. Caution was given to subjects to place a plus or a minus sign next to the numerical index as the sign would affect the scoring procedures. Subjects were informed that they would sit for one-half hour and then walk around for five minutes in each of the groups and that there would be a break at the end of one and one-half hours. The subjects were then given a 10 minute break prior to beginning the training.

Training

Training for the experimental group consisted of specific instructions mediated by a trainer (see Appendix B). The instructions were given to the experimental group by the trainer and the group was trained in zazen (Zen) meditation techniques (Kapleau, 1989). The training consisted of 30-minute periods of instructions and then five minutes of a walking-around exercises which also have specific instructions (see Appendix B). The training occurred for a three-hour period daily for five days, a total of 15 hours.
Training for the control group involved 30-minute intervals of a structured mathematical exercise (irrelevant activity) from a trainer different than the meditation trainer (see Appendix B). The control group walked around for five-minute intervals without any specific instructions other than to walk around the room slowly. The training occurred for a three-hour period daily for five days, a total of 15 hours.

The control group stayed in the same room as the briefing while the experimental group went to a room (separate from the control group) down a hall. The two rooms were regulated comparably as to temperature, lighting, and noise levels. The room the control group was in was slightly larger than that of the experimental group. The training began at 9:00 a.m and was completed at 12:00 p.m for both groups.

The training for both groups continued on Tuesday, Wednesday, and Thursday as planned. After the training on Thursday, several subjects informed the primary investigator that they would be unable to attend on Friday. A short session was then held with all subjects to see if all could attend on Saturday instead of Friday. All stated that they could but would be unable to return another day for the debriefing. A decision was reached to hold the debriefing following the training on Saturday by all participants. On Saturday morning at 9:00 a.m., the training was completed and the posttest was then administered. The true nature of the study was explained to the subjects. Zazen (Zen) meditation training was offered and several subjects from the control group elected to participate in the training at a future date. Two of the male
subjects related that initially they felt anger during meditation and were surprised that they were experiencing these feelings. They reportedly were able to feel calm as meditation continued. One female subject related that she at first felt the walls of the room surrounding and enveloping her and she became frightened. As she continued the meditation, she said she became "as one with the room and was no longer frightened".

The study proceeded as planned with the exception that the training times were not consecutive and the number of subjects was less than originally anticipated. The subjects stated they understood the pretest and posttest and appeared to fully participate in the training. The five-minute walking after 30 minutes of training improved the subjects concentration, according to self-reports.

Instrumentation

The measuring instruments selected for the current study are the Interpersonal Reactivity Index (IRI) (Davis, 1980, 1983c) and the Emotional Empathic Tendency Scale (EETS) (Mehrabian & Epstein, 1972). The EETS was the pretest instrument and the IRI was the posttest instrument.

The EETS has demonstrated reliability and validity as a measure of empathic emotional (affective) empathy and the IRI has demonstrated reliability and validity as a measure of the multidimensional construct of empathy (Davis, 1980, 1983c). The IRI provides evidence that the multidimensional qualities of empathy are measured (Davis, 1983a, 1983b, 1983c). The EETS is the most widely used measure of emotional (affective) empathy (Miller & Eisenberg, 1987) and the IRI has been used to measure
the construct of empathy in a number of studies (e.g. Davis, 1980; Davis, 1983c; Davis, Hull, Young, & Warren, 1987; Davis & Oathout, 1987).

The Interpersonal Reactivity Index (IRI)

Davis (1980, 1983c) developed the IRI with the idea that empathy is a multidimensional construct. As a result of Davis' factor analytic procedures, the content of the scales on the IRI is relevant to the meaning of empathy. A pool of over 50 items was initially constructed. 201 males and 251 females responded to these items on a five-point scale from zero (does not describe me very well) to four (describes me very well). An initial factor analysis of the data revealed the four major factors which correspond to the scale. The final version of the scale was normed on students from an Introductory Psychology class (males = 579 and females = 582). The individuals involved in the final version were not involved in the other versions.

The IRI has 28-items, four seven-item subscales which tap some aspect of the global concept of empathy (Davis, 1983c). The following subscales are included in this instrument: 1) the fantasy scale (FS) which appears to "tap the tendency to imaginatively transpose oneself into fictional situations (e.g. books, movies, daydreams)" (Davis, 1980, p. 9). Examples of test items are: item number five; "I really get involved with the feelings of the characters in a novel." and item number 16; "After seeing a play or movie, I have felt as though I were one of the characters". (p. 8); 2) the perspective-taking scale (PT) consists of items of real life instances of perspective-taking; the scale "assesses the tendency to spontaneously adopt the
psychological point of view of other" (Davis, 1983c, p.113-114). Examples of test items are: item number 11; "I sometimes try to understand my friends better by imagining how things look from their perspective" and item number eight; "I try to look at everybody's side of a disagreement before I make a decision". (Davis, 1980, p. 9); 3) the empathic concern scale (EC) consists of items "assessing the degree to which the respondent experiences feelings of warmth, compassion and concern for the observed individual" (p. 10). Examples of test items are: item number two; "I often have tender, concerned feelings for people less fortunate than me." and item number 20; "I am often quite touched by things that I see happen". (p. 9); 4) the personal distress scale (PD) consists of items which measure the "individual's own feelings of fear, apprehension and discomfort at witnessing the negative experiences of others". Examples of test items are: item number six; "In emergency situations, I feel apprehensive and ill-at-ease." and item number 24; "I tend to lose control during emergencies" (p. 10).

The PT scale is the one most clearly tapping the nonemotional or cognitive type of empathy (Davis, 1983c). The EC scale is a measure of an emotional type of empathy and a "nonselshfish concern for other people" (p. 121). The PD scale is strongly associated with emotions of "vulnerability, uncertainty, and fearfulness" (p. 121). The FS scale is modestly associated with "verbal intelligence and with a tendency toward emotional reactivity" (p. 120).
The IRI was developed and tested for reliability and validity by Davis (1980, 1983c). The internal reliability coefficients (standardized alpha) were computed for each of the four subscales of the IRI separately for each gender (p=.01) (Davis, 1980). The subscales of FS and PT are essentially unrelated (correlation of approximately .10 for both genders). The EC and the PD subscales (emotional subscales) are nearly orthogonal (r = .11 for males; r = .01 for females). A moderate correlation exists between the FS and EC scores (r's = .30 for males and .31 for females) but there is little relationship with the PD scale. The PT scale is positively related to the EC scale (r's = .33 and .30) and somewhat negatively related to the PD scores (r's = -.16 for males and -.29 for females). The relationships between the cognitive and affective processes are not so strong as to imply that the subscales are measuring the same construct.

The data supports that the IRI "reliably assesses four separate and relatively independent qualities of an individual" (Davis, 1980, p. 13). "The internal reliability of the four subscales is acceptable and the factor structure remains constant for both genders across independent samples and across repeated administrations" (p. 14). The internal reliabilities of the four scales range from .71 to .77. The Empathic Concern Scale's internal reliability coefficients are .72 for males and .70 for females. The test-retest reliabilities range from .62 to .71. The Empathic Concern Scale's test-retest reliability coefficients are .72 for males and .70 for females. The correlations range
from .61 to .79 for males and from .62 to .81 for females. Satisfactory temporal stability with respect to the subscales is exhibited for both males and females.

Divergent validity was demonstrated by Davis (1983) for the IRI when he obtained relationships between the IRI and Hogan Empathy Scale (1969). The Hogan Empathy Scale (1969) is considered to be a measure of cognitive empathy (Gladstein, 1987). The FS and EC scales were substantially less correlated with Hogan's scale (mean r's of .15 and .18, respectively) (Davis, 1980). The PD scale was significantly and negatively associated with Hogan's Empathy Scale (mean r = -.33).

Convergent validity is demonstrated for the affective scales of the IRI and the EETS (Davis, 1983c). The FS and EC scales of the IRI have significant associations with the EETS (mean r's = .52 and .60, respectively). The Hogan Empathy Scale (1969) scale correlated most highly with the cognitive PT scale (mean r = .40) (Davis, 1983c) (see Davis, 1983c for a review).

**Emotional Empathic Tendency Scale**

The Emotional Empathic Tendency Scale was developed as a measure of emotional (affective) empathy (Mehrabian & Epstein, 1972). The result is a 33-item test with intercorrelated subscales which measure related aspects of affective empathy. The subscale intercorrelations exceed .30 in all instances and are significant at the .01 level. "The content validity of the scale is inferred in part from factor analyses of a larger pool of items" (p. 527).
Plus or minus signs preceding each item indicate the direction of the scoring (Mehrabian & Epstein, 1972). The scale ranges from +four to -four. Plus four is very strong agreement and minus four is very strong disagreement. Items contain responses which define emotions such as feeling angry when someone is being "ill-treated" (p. 528), feeling laughter when someone else is laughing, and feeling nervous if others are feeling nervous. The split-half reliability for the instrument is .84. The discriminant validity was .06 when correlated with a social desirability scale (Crowne & Marlowe, 1960).

Divergent validity was demonstrated by Davis (1983) for the EETS with a low correlation on the cognitive PT subscale of the IRI and the EETS (mean r = .20). The PD scale exhibited a relationship more like that of the PT scale with the EETS (mean r = .24).

Divergent validity for the EETS was demonstrated by Mehrabian and Epstein, (1972). The EETS correlated negatively with a measure of aggression and defensiveness (i.e. defensiveness) (Jackson, 1967). A correlation of -31 was obtained. A subsequent study (Mehrabian & O'Reilly, 1980) using the same measure of aggression and defensiveness (Jackson, 1967) obtained a correlation of -.16 (p = .01) on the aggression measure and a correlation of -.18 (p = .01) on the defensiveness measure (Mehrabian & O'Reilly, 1980) (see Mehrabian, Young & Sato, 1989 for a review).
Validity Issues

External Validity

The research design for the current study is a randomized subjects, pretest-posttest control group design (Ary, Jacob, & Razavieh, 1985). Three threats to external validity are inherent in this design. The first threat is that the results obtained from this pretested population are not representative of the unpretested population. Results may not be generalizable to other subjects in a nonexperimental setting (a natural setting) due to the possible effects that being in an experimental setting may have in the changes in the dependent variable. The second threat to external validity is that since the subjects have not been randomly selected from a general population, generalization to the general population is not possible. The third threat to external validity lies with the pretest which may interact with the subjects and change the subjects or sensitize them in certain ways.

Internal Validity

The primary threat to internal validity lies with experimental mortality (Campbell & Stanley, 1966). There may be a loss of subjects between pretesting and posttesting which would affect the outcome of the scores.

Variables

The training module for affective empathy is zazen (Zen) meditation (Kapleau, 1989) and is defined as the independent variable. The irrelevant activity consists of basic mathematics and is defined as the control variable. The scores on the EETS
(Mehrabian & Epstein, 1972) are defined as the covariate and the scores on the EC subscale of the IRI (Davis, 1980) are defined as the dependent variable.

**Delimitation of the Variables**

By providing a section for the discussion of the dependent variable, the covariate, the control variable, and the independent variable, an attempt is made to delimit the concepts under investigation (Gage & Cronbach, 1955). The operational definitions of the dependent variable and the covariate are directly related to the definitions of these variables from the measuring instruments. The operational definition of the independent variable, zazen (Zen) meditation is related to the physiological and psychological studies presented in the literature review.

The dependent variable, affective empathy, is defined as the set of posttest scores obtained by the subjects on the empathic concern (EC) subscale of the Interpersonal Reactivity Index (IRI) (Davis, 1980, 1983c). Generalizability of the results is limited to these posttest scores.

The covariate, affective empathy, is defined as the set of pretest scores obtained by the subjects on the Emotional Empathic Tendency Scale (EETS) (Mehrabian & Epstein, 1972). Generalizability of the results is limited to these pretest scores.

The control variable is based on sequential and structured exercises in basic mathematics. A problem-solving/didactic control condition is considered nonsocial and nonemotional (e.g. Feshbach, 1982; Linden, 1973).
The independent variable is zazen (Zen) meditation; a training method for affective empathy. Zazen (Zen) meditation is described as closely aligned with the affective empathic process and there is some empirical evidence for this relationship (Keefe, 1979; Lesh, 1970). Zazen (Zen) meditation enhances the capacity for attention to immediate experience in perceptions, attention, and sensations in an interpersonal situation, thus providing an individual with the skills to perceive and respond to another with high levels of affective empathy (Keefe, 1979). Zazen (Zen) meditation emphasizes learning to listen to one's own inner responses so that one is then able to experience others (Lesh, 1970).

**Summary**

The chapter provided an overview of the methodology of the current study. The sections on the subjects and procedures covered the recruitment of the subjects and the details of how the experiment was carried out. Details of the instruments was provided in the next section. The last section covered the definitions and delimitations of the variables and validity concerns related to the current study.
CHAPTER IV

Analysis of the Results

Chapter four first presents the data analysis and a restatement of the research hypothesis. The statistical procedures are presented next followed by the results section, the discussion of the results, and a summary.

Data Analysis

The posttest scores of the control group and the experimental group were analyzed using the analysis of covariance. The means and standard deviations were computed on all pretest and posttest scores. The F statistic was used to test for significance.

Research Hypothesis

Individuals trained in deep breathing techniques (zazen (Zen) meditation) show no difference in affective empathy scores from individuals who experience an irrelevant activity (basic mathematics).

Null hypothesis: Ho: μ2 = μ4

Alternative hypothesis: H1: μ2 > μ4

The research question relates to differences between the experimental and control group means on the posttest scores to test for significant differences. If a significant difference exists, the null hypothesis can be rejected.
Statistical Procedures

The analysis of covariance (ANCOVA) is the statistical procedure utilized in the current study. The analysis of covariance to test for significance is chosen because the assumption of random sampling cannot be met (Huck, 1972). The portion of each subject's posttest score that is in common with the pretest score is removed (Ary et al., 1985). The statistical analysis will allow for control for mean differences on the covariate to adjust for differences between groups. The use of a covariate which correlates with the dependent variable reduces the likelihood of Type II errors.

Results

The null hypothesis is not rejected since the obtained F does not exceed the critical value at the .05 level of significance. A conclusion is reached that there is insufficient information to be able to state that the difference between population means is not zero. The confidence intervals lead to the conclusion that the population means are not equal to zero because zero is not included between the upper and lower limits of the interval.
A content analysis of the demographics was constructed for the total subjects and for each of the groups (see Table I).

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<tr>
<td>Ages</td>
<td>60-77</td>
<td>61-76</td>
</tr>
<tr>
<td>Males</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Females</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Education</td>
<td>8th to 4 yrs. college</td>
<td>7th to 4 yrs. college</td>
</tr>
<tr>
<td>Hispanics</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Caucasian</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Lives alone</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Lives with another</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>
Quantitative analysis

The following table and discussion relate to the quantitative analysis of the results.

Table II

<table>
<thead>
<tr>
<th>Control Group</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>32.7</td>
<td>23.3+</td>
</tr>
<tr>
<td>Median</td>
<td>31.5</td>
<td>24.0</td>
</tr>
<tr>
<td>Std Error</td>
<td>5.9</td>
<td>1.15</td>
</tr>
<tr>
<td>Variance</td>
<td>352.9</td>
<td>13.13</td>
</tr>
<tr>
<td>Std Dev</td>
<td>18.8</td>
<td>3.57</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Bin Center</th>
<th>Histogram</th>
<th>Frequency</th>
<th>Bin Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00</td>
<td>5.00</td>
<td>*</td>
<td>3.00</td>
<td>15.00</td>
</tr>
<tr>
<td>1.00</td>
<td>15.00</td>
<td>*</td>
<td>7.00</td>
<td>25.00</td>
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<tr>
<td>3.00</td>
<td>25.00</td>
<td>***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.00</td>
<td>35.00</td>
<td>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.00</td>
<td>45.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.00</td>
<td>55.00</td>
<td>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.00</td>
<td>65.00</td>
<td>*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

+=Adjusted, Bin width=10, Each star=1 case(s)
The mean of the experimental group on the EETS (pretest) compared to the mean of the control group on the EETS (pretest) are 25.1 and 32.7 respectively (see Table II). The adjusted means are 22.5 for the experimental group and 23.3 for the control group. The mean of the experimental group on the IRI (posttest) is 22.5 and the mean for the control group on the IRI (posttest) is 23.3. The standard deviation for the experimental group and the control group pretest is 20.1 and 18.8 respectively and for the experimental group and the control group posttest the standard deviations are
3.57 and 3.62 respectively. The spread of the scores is less in the posttest scores than in the pretest scores in both groups. Histograms are also presented in Table II.

| Table III |
|-------------------------|-------------------------|-------------------------|-------------------------|
|                          | Control Group           |                          | Experimental Group      |
|                          | Pretest                 | Posttest                | Pretest                 | Posttest                |
|                          | Mean                    | Mean                    | Mean                    | Mean                    |
|                          | 32.7                    | 23.3                    | 25.1                    | 22.6                    |
|                          | 19.3 to 46.1            | 20.7 to 25.9            | 9.7 to 40.5             | 19.8 to 25.3            |

Confidence intervals for all groups are presented in Table III. The 95% confidence intervals are narrow in range in the posttest groups so there is a probability that the population means of the groups lies between these values. The pretest groups have a wider range so there is less support for the belief that the true means are actually 32.7 (control group) and 25.2 (experimental group) (see Table III).

A quantitative analysis of the data indicates that there is a decrease in the means of the groups rather than a gain. The decrease is less in the mean of the experimental group than in the mean of the control group. The means indicate a loss in affective empathic ability rather than a gain. A closer inspection of the individual scores demonstrates that the high scorers decreased an average of 25 points in the experimental group and an average of 22 points in the control group. The low scorers gained an average of 27 points in the experimental group and an average of 18 points in the control group. The intermediate scorers gained an average of three points in the
experimental group and an average of two points in the control group. An alternative hypothesis may be stated that the high scoring affective empathizers are at ceiling levels and zazen (Zen) meditation training and/or mathematical exercises will not improve their scores but may actually cause scores to fall due to some unknown factor (motivation perhaps). The low scoring affective empathizers increase their scores. The same pattern is observed in the control group although not as dramatic an increase is noted in the low scorers as in the experimental group. Zazen (Zen) meditation may be operating to increase scores in low scorers more so than the mathematical exercises. The pattern of a slight increase in scores in the intermediate scorers is similar in the experimental and control groups so an hypothesis is difficult to render. Senior citizens low in affective empathy may respond quickly to zazen (Zen) training as a means of increasing affective empathy where intermediate scorers may need longer periods of training before significant increases are noted. Zazen (Zen) meditation will not improve senior citizens high in affective empathy but may actually decrease affective empathy levels.

The higher mean for the control group pretest may be due to the fact that there are more females than males in the group. The norms on the EETS for combined males and females are means = 33. The experimental group means (pretest=25.1; posttest=22.5) as compared to the norms are lower in the measure of affective empathy. The means of the control group (pretest=33.7; posttest=23.3) are similar to
the on the pretest and lower on the posttest. The means suggest that senior citizens may be low in affective empathy skills as indicated by the literature review.

**Qualitative analysis**

The following tables and discussion relate to the qualitative analysis of the data.

**Table IV**

<table>
<thead>
<tr>
<th></th>
<th>Control Group</th>
<th></th>
<th>Experimental Group</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td>K-S (Lilliefors)</td>
<td>.1513</td>
<td>.1824</td>
<td>.1629</td>
<td>.1734</td>
</tr>
<tr>
<td>df</td>
<td>10</td>
<td>10</td>
<td>9</td>
<td>9</td>
</tr>
</tbody>
</table>

The levels of significance for normality are presented in Table IV.

**Table V**

**Correlations of Covariates and Dependent Variables**

<table>
<thead>
<tr>
<th></th>
<th>Control Group</th>
<th>Experimental Group</th>
</tr>
</thead>
</table>

The correlations between the covariates and the dependent variables for the control group and for the experimental group are presented in Table V.
Table VI

Plots of the Covariates and the Dependent Variables

Control Group
Table VI - continued

Plots of the Covariates and the Dependent Variables

Experimental Group
The plots of the covariates and the dependent variables provide a visual examination of linearity (see Table VI).

| Table VII |
| Homogeneity of Regression Coefficients |
| Source | df | SS | MS | F |
| Heterogeneity of slopes | a-1 | 1 | 171.8 | 171.8 | 53.69 |
| Individual residual | n-(2a) | 15 | 48.2 | 3.2 |
| Within residual | n-a-1 | 16 | 220.0 |
| Regression slopes for Control Group = -.09 | Experimental Group = .085 |

The summary table for the F test for the homogeneity of regression coefficients and the slopes for the treatment populations are presented in Table VII. The null hypothesis associated with this test is:

\[ H_0: B_1 = B_2 = \ldots = B_a \]

Alpha is set at .05 level of significance.
Table VIII

<table>
<thead>
<tr>
<th>Homogeneity of Variance</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sum-of-Squares Residual</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Group</td>
<td>120.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental Group</td>
<td>104.5</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Conditional Variance Estimates</th>
<th>C'</th>
<th>df</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group</td>
<td>15.1</td>
<td>n-1-1</td>
<td>8</td>
</tr>
<tr>
<td>Experimental Group</td>
<td>14.9</td>
<td>n-1-1</td>
<td>7</td>
</tr>
</tbody>
</table>

The results of the homogeneity of variance test are presented in Table VIII. The Bonferroni F statistic is used. Alpha is set at the .05 level of significance.

Table IX

<table>
<thead>
<tr>
<th>Analysis of Covariance</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SV</td>
<td>df</td>
<td>SS</td>
<td>MS</td>
<td>F</td>
</tr>
<tr>
<td>Total</td>
<td>an-2</td>
<td>17</td>
<td>222.99</td>
<td></td>
</tr>
<tr>
<td>A (adj)</td>
<td>a-1</td>
<td>1</td>
<td>2.79</td>
<td>2.79</td>
</tr>
<tr>
<td>S/A (adj)</td>
<td>a(n-1)-1</td>
<td>16</td>
<td>220.2</td>
<td>13.8</td>
</tr>
</tbody>
</table>
An analysis of covariance table is presented in Table IX and an analysis of variance table is presented in Table X.

**Discussion of the results, assumptions, and consequences.** The plots of the covariates and the dependent variables are nonlinear in appearance (see Table VI). The hypothesis of normality can be rejected based on the levels of significance (see Table IV). The assumption of linearity and normality are not met.

The critical F for the homogeneity of regression coefficients is 4.54 and the null hypothesis is rejected (see Table VII). The assumption of homogeneity of regression coefficients is not met.

The critical F for the homogeneity of variances is 4.9 and the hypothesis of equal conditional variances is retained since the obtained value is less than the critical value (see Table VIII). The homogeneity of variance assumption is met.

The consequences of violating the assumptions of the analysis of covariance are now discussed. The analysis of covariance is fairly robust when the normality assumption is violated as long as the design is balanced (Huiitema, 1980). In most
behavioral studies, nonnormality in the dependent variable has little effect on the ANCOVA F because "the covariates are at least crude approximations of normally distributed random variables" (p. 117).

Nonlinearity is least severe when subjects are randomly assigned to groups and the dependent variable is normally distributed (Myers, 1979). The main consequence of violating the assumption of linearity is that the "utility of the covariate will be diminished because the adjustment of the means (if any) and the gain in power of ANCOVA over ANOVA depends on the degree of linear relationship between the covariate and the dependent variable" (p. 116). When sample sizes are equal and the relationship is small to moderate, "the ANCOVA F-test closely follows the central F distribution" (Olejnik & Algina, 1984, p. 130).

The consequences for violating the assumption of homogeneity of regression coefficients depends upon the sample sizes and the magnitude of the difference in the within-group slopes (Olejnik & Algina, 1984). When sample sizes are equal and the "difference in the relationships is small to moderate, the ANCOVA F-test for group differences closely follows the central F-distribution" (p. 130). ANCOVA appears to be robust to the violation of the homogeneity of regression and the power is not severely altered when group sizes are equal (Hamilton, 1977; Levy, 1980).

Rank analysis of covariance or other data transformations are not selected because the assumption of a monotonic increasing function is not met (Huitema, 1980; Olejnik & Algina, 1985).
Analysis of covariance and analysis of variance. The analysis of covariance and the analysis of variance are computed since the subjects were randomly assigned to groups and because the differences among the sample sizes are not large.

The gain in power of ANCOVA over ANOVA depends upon the degree of linear relationship between the covariate and the dependent variable (Huck, 1972). The correlation between the covariate and the dependent variable in the experimental group is .46 and -.47 in the control group (see Table V). If the correlation between the dependent variable and the covariate is too low, there can be a loss of power when using the analysis of covariance. An analysis of variance table is presented in Table X. The obtained F is slightly higher but still not enough to reject the null hypothesis.

A qualitative analysis of the data reveals an insignificant F statistics when viewing the analysis of covariance and the analysis of variance (see Table IX and Table X). The error term (residuals within) is large as compared to the treatment effects (adjusted treatment). The critical value for ANCOVA is 4.49 and the critical value for ANOVA is 4.45.

Insufficient evidence exists to be able to state that the difference between population means is not zero. The null hypothesis is retained.

Conclusions

In the study, the training of zazen (Zen) meditation for the purpose of increasing affective empathy levels in senior citizens is not significant when compared to a control group. The subjects had lower measures of affective empathy than the
norms; however, the norms may be biased as senior citizens were not included in norms. The means indicate that affective empathy levels overall decreased in both the experimental and control groups. The decrease in affective empathy was less in the experimental group than in the control group. The high scorers decreased, the low scorers increased, and the intermediate scorers increased slightly in affective empathy levels in both groups. The increases and decreases were slightly more prominent in the experimental group than in the control group.

Significant differences were not found. The wide variation and small sample sizes make it difficult to conclude that these groups do not differ statistically.

Summary

The chapter covered the analysis of the data as the data related to the research hypothesis. The statistical procedures used were the analysis of covariance and the analysis of variance. The results were that the null hypothesis is retained.
CHAPTER V
Discussion and Recommendations

A discussion of the findings of the current study and recommendations for future research are presented in this chapter.

Discussion

Findings of the current study resulted in no significant treatment effects in the application of zazen (Zen) training to increase affective levels of empathy in senior citizens. The analysis of covariance is robust to violations of assumptions; however, the small numbers and the differences in the affective empathic levels of the subjects may have contributed to the increase in the within group variability so that a significant F was not obtained. The difficulty in following through with the application of the treatments in the experimental and control groups on consecutive days may have introduced learning and maturation as an internal validity problem and decreased the effect of the independent and irrelevant variables. The time necessary to produce an increase in affective empathy levels using Zazen (Zen) meditation may need to be of longer duration for senior citizens. Several of the physiological studies indicate that long periods of time produce brainwave differences. If affective empathic skills are dependent on these changes in brainwaves, then training periods of longer duration would be essential and may be related to the intermediate scorers more so than to the low scorers. Zazen (Zen) meditation or any training may not have an affect on those who score high on affective empathy.
A question may be raised as to whether the irrelevant activity (mathematics) was as effective in producing changes in both groups as the independent variable.

Zazen (Zen) meditation as a means of increasing affective empathy levels in the senior citizen may result in a significant difference if the time in meditation training and the number of subjects are increased. Significant differences may exist when zazen (Zen) meditation training is applied to only intermediate and low scoring affective empathizers. The two groups were trained in similar settings and appeared to be similar in demographics. The results are insignificant that zazen (Zen) meditation is effective in training senior citizens to increase their levels of affective empathy.

Recommendations

The empathic response is considered the sine que non of emotions (Smither, 1977). Adding or enhancing this response in an individual’s behavioral repertoire may serve as a pivotal point for behavioral change.

Recommendations as they relate to current findings lie in the replication of the study. The use of larger numbers and/or longer time periods may reduce the error term and a significance of the treatment effects may be obtained. The use of a different irrelevant variable other than mathematical exercises may provide a different outcome in posttest scores. Consideration of the various levels of affective empathy in individuals (i.e. low, intermediate, and high scorers) may result in a significance of treatment effects for zazen (Zen) meditation.
Future Research

Future research may continue to be based on the theory that affective empathy training using zazen (Zen) meditation appears to benefit individuals in interpersonal relationships. Implications for future research lie in the study of affective and cognitive empathy training and the benefits which may result for the senior citizen and other populations. The combination of affective and cognitive training with senior citizens is an area yet to be explored. The use of other populations as subjects may provide different results in studying the effects of zazen (Zen) meditation on affective and/or cognitive empathy.

Low, intermediate, and high affective empathy scorers may be separated and zazen (Zen) meditation training applied to an experimental and control group situation with a different irrelevant variable or a different research design in order to study the levels of affective empathy.

The observation of similarities of the physiological responses of affective empathy and the zazen (Zen) meditation is a study for future research. The physiological responses between the two may be similar.

A possibility for future research would be to explore zazen (Zen) meditation as a training method to increase scores for cognitive empathy alone or in combination with a study using zazen (Zen) meditation to increase scores in affective empathy.

A final area for future research would be to explore the affects mathematics has on affective empathy levels in various populations since the results of the current
study were unclear as to the effects mathematics may have on affective empathy levels.

Implications

The gain in knowledge about affective empathy levels in senior citizens, the observations during the training, and the results add to the knowledge about affective empathy levels in the senior citizen population and provide empirical knowledge for future research.

The findings of the current study may be used by educators, practitioners, and policy makers to incorporate into current and anticipated programs for senior citizens. The addition of affective empathy training may provide interpersonal skill-building to aid the senior citizen in developing new or adding to an existing social network. Peer counselor training for senior citizens may benefit from the results of the current study in gaining information to add to existing training packages.

Summary

The discussion covered the findings and looked at alternative hypotheses. Recommendations for future research and for the benefits of the results to the professional are covered in the chapter.
Appendix A: Permissions
May 10, 1991

Dr. Albert Mehrabian
1130 Alta Mesa Road
Monterey, Ca. 93940

Dear Dr. Mehrabian:

I wrote to you several months ago requesting information regarding your measure of Emotional Empathic Tendency. Your graduate student, Patricia Valdez was kind enough to send to me the fees and listings of your materials. I am now requesting your permission to use this test in my dissertation. I am a doctoral candidate in Rehabilitation Psychology at the University of Arizona, Tucson, Arizona. My dissertation topic is on empathy training with individuals who exhibit pedophilic behaviors. I will be glad to send to you any additional information which you may need prior to granting permission.

Thank you.

Permission granted for use of the EEETS to run your subjects for your dissertation research. Please do not duplicate the test in your dissertation writing.

Best wishes,

Sincerely,

Jane A. Newman
P.O. Box 748
Kearny, Arizona 85237

May 16, 91
December 20, 1990

Jane A. Newman
P.O. Box 748
Kearny, AZ 85237

Dear Ms. Newman:

Thanks for your interest in the IRI, and please excuse my lateness in responding to your request. You of course have my permission to use the scale, and I am enclosing a copy of the measure with this letter, along with some other information you may find useful. Please let me know if you have any questions regarding its use. If you do end up using the IRI, I would appreciate it if you could drop me a line when your work is complete and let me know what you found. Best of luck with your dissertation!

Sincerely,

Mark H. Davis
Assistant Professor
May 5, 1992

Jane A. Newman
P.O. Box 748
Kearny, AZ 85237

Dear Ms. Newman:

Please feel free to use and quote from my work on empathy. Also, you may find the following book quite useful: Arnold P. Goldstein and Gerald Y. Michaels, Empathy: Development, Training, and Consequences, Hillsdale: New Jersey, Lawrence Erlbaum Associates Publisher, 1985. The book also used my stages of the empathic process as a basis.

Attached are some articles that relate to empathy. Good luck with your dissertation.

Sincerely,

Thomas W. Keefe, ACSW, DSW
Professor and Head

Tk/at
January 02, 1992

RE: THE THREE PILLARS OF ZEN

Dear Ms. Newman:

We have no objection to your use of the above material in your dissertation, as requested in your letter, subject to the following conditions:

1. Such material must be reproduced exactly as it appears in our publication;
2. Full acknowledgment of the title, author, copyright and publisher is given;
3. If you ever have your dissertation published, you must reapply for permission.

Best wishes for the success of your paper.

Yours sincerely,

Sincerely,

Carol Christiansen
Permissions Manager
Appendix B: Zazen Instructions and Irrelevant Activity Instructions
Zazen Meditation Instructions

Instructions will be given to the participants prior to beginning the experiment which will inform them to wear simple, loose clothing and to bring a cushion to sit on.

First day

We will first go through the instructions prior to beginning the actual training. If you become tired, uncomfortable, or anxious at any time, remember that sitting still and concentrating restricts the usual way of avoiding discomfort (Lesh, 1970). Eventually you will be able to be comfortable but you may need to move your body until you are comfortable (Weinpahl, 1964; Maupin, 1962). If you continue to feel uncomfortable, please feel free to walk around, leave the room, or discuss what you are feeling with the instructor.

Sit in your chair, back erect and allow your feet to just rest on the floor (Weinpahl, 1964). Note that a triangle is formed. Allow your eyes to rest on a spot about two to three feet in front of your. Rest your right hand in your lap, palm upward, and place the left hand, palm upward on top of the right palm (Kapleau, 1989). Touch the tips of the thumbs to each other so that a flattened circle is formed by the palms and thumbs. Your head should be straight. Your ears should be in line with your shoulders and the tip of your nose in line with your navel. Your body from the waist up should feel weightless and free from any pressure or strain. Keep your eyes open and your mouth closed. The tip of your tongue should lightly touch the back of your upper teeth. If you close your eyes, you will fall into a dull dreamy state. Your gaze should be lowered without focusing on anything in particular. Be careful not to incline your head forward and to hold your head erect. Your spinal column must be erect at all times. When you have established a correct posture, take a deep breath, hold it momentarily and then exhale slowly and quietly. Repeat this two or three times, breathing through your nose. After this breathe naturally. When you become accustomed to this routine, one deep breath at the beginning will be sufficient. During the training, breathe naturally without trying to manipulate your breath. Now bend your body first to the right as far as it will go then to the left about seven or eight times in large arcs to begin with and then smaller arcs until your trunk naturally comes to rest at the center.

Now you are ready to concentrate on your mind (Kapleau, 1989). To start, count both inhalations and exhalations. Count "one" when you inhale, and "two" when you exhale, "three" when you inhale, and "four" when you exhale and so on up to the number ten. Return to the count of one and once more count up to ten, continuing as
before. If you lose count, return to the count of one. Fleeting thoughts which naturally fluctuate in the mind are not a problem. Allow random thoughts arise and vanish as they will. Do not focus on or try to rid yourself of these thoughts but rather concentrate all of your energy on your counting and the inhalations and exhalations of your breath. You will end a period of sitting after thirty minutes and I will let you know when thirty minutes have past. When a period of sitting ends, do not arise abruptly but begin the period by rocking from side to side, first in small swings and then in large swings about six or seven times. Swing your body first to the left and then to the right. Rise slowly and quietly and walk around. We will walk for five minutes after each sitting period of thirty minutes. As you rise to walk around place your right fist with the thumb inside on your chest and cover your fist with the left palm while holding both elbows at right angles. As you slowly walk around the room keep your arms in a straight line and your body erect. Rest your eyes on a point about two yards in front of your feet and at the same time continue to count inhalations and exhalations. Begin walking with your left foot and walk in such a way that your foot sinks into the floor with first your heel and then your toes. Walk calmly and steadily.

We will now practice the routine once before beginning the actual training.

Second day

Repeat the same instructions as for day one except when the breathing instructions are given, they will be as follows: Yesterday I told you to count "one" as you inhaled and "two" as you exhaled (Kapleau, 1989). Today I want you to count "one" only when you exhale so that one full breath (inhalation and exhalation) will be "one". Do not count when you inhale, only count "one", "two", "three" and so on when you exhale. Continue up to thirty minutes and then walk around as yesterday. I will let you know when thirty minutes is up and when you have walked around for five minutes.

Third day

Repeat the instructions as in day one except when the breathing instructions are given, they will be as follows: Instead of counting your exhalations as before now count "one" on the first inhalation, "two" on the next inhalation and so on up to ten (Kapleau, 1989). I will let you know when thirty minutes is up and when you have walked around for five minutes.
Fourth day

Repeat the instructions as in day one except when the breathing instructions are given, they will be as follows: Today you will stop counting your breaths and will concentrate only on following your inhalations and exhalation trying to experience them totally (Kapleau, 1989). I will let you know when thirty minutes is up and when you have walked around for five minutes.

Fifth day

Repeat the instructions as in day one and the breathing instructions as in day four.
Instructions for the Irrelevant Activity

Instructions will be given to the participants prior to beginning the experiment which will inform them to wear simple, loose clothing and to bring a cushion.

First day

"The purpose of this training is to instruct you in basic mathematics. Often you must reread or ask again for instructions to be sure you understand. I will give information on the subject matter for 30 minutes. You will then arise and walk around the room for five minutes. You will alternate the times for three hours today and then return tomorrow for the same routine. The first day will cover whole numbers, the commutative and associative laws and the distributive law."

Second day

The instructions for the second day are the same as for the first day except the contents will cover fractions, mixed numbers, and the properties of zero.

Third day

The instructions for the third day are the same as for the first day except the contents will cover decimals.

Fourth day

The instructions for the fourth day are the same as for the first day except the contents will cover manipulation of percents.

Fifth day

The instructions for the fifth day are the same as for the first day except the contents will cover beginning algebra.
Appendix C: Demographic Questionnaire and Advertisement
Demographic Questionnaire

Please fill out the following information. The information about you will not be used to identify you in any way but will only be used to describe the group as a whole. By filling out the questionnaire, an assumption is made that you give your consent to use the information obtained in the current study under the same conditions as stated in the Subject’s Consent form (please initial).

Age_______ Male________ Female_______

Marital Status: __ single __ divorced __ widowed
married __ never married __

Occupation (if retired, please put retired plus your occupation prior to your retirement)_______

Current source of income (e.g. retirement, social security)

Level of education (e.g. 8th grade, high school, number of years of college)____________________

Ethnic Origin (e.g. hispanic, caucasian)_____________________________________________________

Languages spoken and which you understand well__________________________________________

Social activities in which you are currently engaged (e.g. visit friends, community activities, Senior Center)__________________________

Number of individuals living in your household and their relationship to you_____________________

Is transportation difficult for you to obtain? yes__ no__

Number of friends or family you see regularly_________
Exercise activities in which you participate on a regular basis

Thank you for completing the demographic questionnaire.

Physical requirements for the study are an ability to hear the instructions and an ability to sit in a chair on a cushion for 30 minutes and then to walk around for five minutes. These two activities will last for three hours per day for five days in a row. Please answer the following questions.

1. Do you have any physical limitations which would prevent you from participating in the study given the above physical requirements? yes__ no__

Please list if you answered yes.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

2. Do you have any physical limitations for which you will need special accommodations? yes__ no__

Please list if you answered yes.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
ADVERTISEMENT

A study to develop different teaching methods for use in the behavioral health field is being conducted that may be of benefit to senior citizens ages 60-85. Volunteers are needed for three hours a day for five days. Please call Jane Newman, 363-7118 if you are interested in participating.
Appendix D: Interpersonal Reactivity Index and Exception Letter
The following statements inquire about your thoughts and feelings in a variety of situations. For each item, indicate how well it describes you by choosing the appropriate letter on the scale at the top of the page: A, B, C, D, or E. When you have decided on your answer, fill in the letter on the answer sheet next to the item number. READ EACH ITEM CAREFULLY BEFORE RESPONDING. Answer as honestly as you can. Thank you.

**ANSWER SCALE:**

A: DOES NOT DESCRIBE ME WELL  
B: DESCRIBES ME  
C: DESCRIBES ME WELL  
D: ME VERY WELL  
E: ME VERY WELL

**SCORING SCALE:**

1. I daydream and fantasize, with some regularity, about things that might happen to me.
2. I often have tender, concerned feelings for people less fortunate than me.
3. I sometimes find it difficult to see things from the "other guy's" point of view.
4. Sometimes I don't feel very sorry for other people when they are having problems.
5. I really get involved with the feelings of the characters in a novel.
6. In emergency situations, I feel apprehensive and ill-at-case.
7. I am usually objective when I watch a movie or play, and I don't often get completely caught up in it.
8. I try to look at everybody's side of a disagreement before I make a decision.
9. When I see someone being taken advantage of, I feel kind of protective towards them.
10. I sometimes feel helpless when I am in the middle of a very emotional situation.
11. I sometimes try to understand my friends better by imagining how things look from their perspective.

12. Becoming extremely involved in a good book or movie is somewhat rare for me.

13. When I see someone get hurt, I tend to remain calm.

14. Other people's misfortunes do not usually disturb me a great deal.

15. If I'm sure I'm right about something, I don't waste much time listening to other people's arguments.

16. After seeing a play or movie, I have felt as though I were one of the characters.

17. Being in tense emotional situation scares me.

18. When I see someone being treated unfairly, I sometimes don't feel very much pity for them.

19. I am usually pretty effective in dealing with emergencies.

20. I am often quite touched by things that I see happen.

21. I believe that there are two sides to every question and try to look at them both.

22. I would describe myself as a pretty soft-hearted person.

23. When I watch a good movie, I can very easily put myself in the place of a leading character.

24. I tend to lose control during emergencies.

25. When I'm upset at someone, I usually try to "put myself in his shoes" for a while.
26. When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me.

27. When I see someone who badly needs help in an emergency, I go to pieces.

28. Before criticizing somebody, I try to imagine how I would feel if I were in their place.
May 10, 1991

Dr. Albert Mehrabian
1130 Alta Mesa Road
Monterey, Ca. 93940

Dear Dr. Mehrabian:

I wrote to you several months ago requesting information regarding your measure of Emotional Empathic Tendency. Your graduate student, Patricia Valdez was kind enough to send to me the fees and listings of your materials. I am now requesting your permission to use this test in my dissertation. I am a doctoral candidate in Rehabilitation Psychology at the University of Arizona, Tucson, Arizona. My dissertation topic is on empathy training with individuals who exhibit pedophilic behaviors. I will be glad to send to you any additional information which you may need prior to granting permission.

Thank you.

Permission granted for me to use EEETS to run your subjects for your dissertation research. Please do not duplicate the test in your dissertation writing.

Best wishes,

Jane A. Newman
May 16, 1991

Kearny, Arizona 85237
Appendix E: Consent Forms and Human Subjects Committee Approval Form
SUBJECT’S CONSENT

I AM BEING ASKED TO READ THE FOLLOWING MATERIAL TO ENSURE THAT I AM INFORMED OF THE NATURE OF THIS RESEARCH STUDY AND OF HOW I WILL PARTICIPATE IN IT, IF I CONSENT TO DO SO. SIGNING THIS FORM WILL INDICATE THAT I HAVE BEEN SO INFORMED AND THAT I GIVE MY CONSENT. FEDERAL REGULATIONS REQUIRE WRITTEN INFORMED CONSENT PRIOR TO PARTICIPATION IN THIS RESEARCH STUDY SO THAT I CAN KNOW THE NATURE AND THE RISKS OF MY PARTICIPATION AND CAN DECIDE TO PARTICIPATE OR NOT PARTICIPATE IN A FREE AND INFORMED MANNER.

Purpose
I am voluntarily participating in a research project to develop different teaching methods for use in the behavioral health field. I understand that the intent in not knowing the exact nature of the study at the beginning is not to bring harm to me in any way or manner but is due to the possibility that my knowing would result in not obtaining accurate results. I know that I will understand the exact nature of the study at the end of the research and will be able to ask any questions that I choose at that time.

Procedure
If I agree to participate, I will be asked to consent to the following:
- participate in a training for three hours a day for five consecutive days (with the exception of the first day which will be four hours, one hour of which will include an introduction, a paper and pencil questionnaire, and another form for testing);
- begin at 8:00 a.m. on the first day until 12:00 p.m., and begin at 9:00 a.m. and continue until 12:00 p.m. on all of the following four days;
- sit for 30 minutes, and then get up and walk around for five minutes and so on until three hours have gone by;
- fill out a questionnaire that asks questions about me of a non-intimate nature;
- fill out a form before the training that asks questions about some of my behaviors that are also non-intimate in nature and a form that is similar at the end of the training;
- be assigned to one of two groups randomly (this means I have an equal chance of being assigned to either of the two groups) (each group will receive a different type of behavioral training);
- be in a room with regulated noise, temperature, and lighting.

Risks
The most common risks in the study are a possibility of mild anxiety and fatigue. Incidence (how often this occurs in the total population) is not known. I understand that I may feel free to move around, to leave, or to discuss any of the risks with the instructor at any time during the study if I need or wish to.
Benefits
I understand that I will receive no benefits for my participation in the study.

Confidentiality
I understand that my identity will be protected by assigning to me a number and that my name will not be used in the results of the study. I understand that the information obtained from the demographic questionnaire will not identify me in any manner but will only be used to describe the groups.

I understand that the only individuals who will have access to the information from the study are as follows:

Jane A. Newman  Amos Sales  Charles Brainerd
Thomas H. Herbst  Inez Tucker  Jack Bergan
Robert Johnson

AUTHORIZATION
BEFORE GIVING MY CONSENT BY SIGNING THIS FORM, THE METHODS, INCONVENIENCES, RISKS, AND BENEFITS HAVE BEEN EXPLAINED TO ME AND MY QUESTIONS HAVE BEEN ANSWERED. I UNDERSTAND THAT I MAY ASK QUESTIONS AT ANY TIME AND THAT I AM FREE TO WITHDRAW FROM THE PROJECT AT ANY TIME WITHOUT CAUSING BAD FEELINGS OR AFFECTING MY MEDICAL CARE. IF I HAVE QUESTIONS CONCERNING MY RIGHTS AS A RESEARCH SUBJECT, I MAY CALL THE HUMAN SUBJECTS COMMITTEE OFFICE AT (602) 626-6721. MY PARTICIPATION IN THIS PROJECT MAY BE ENDED BY THE INVESTIGATOR FOR REASONS THAT WOULD BE EXPLAINED. NEW INFORMATION DEVELOPED DURING THE COURSE OF THIS STUDY WHICH MAY AFFECT MY WILLINGNESS TO CONTINUE IN THIS RESEARCH PROJECT WILL BE GIVEN TO ME AS IT BECOMES AVAILABLE. I UNDERSTAND THAT THIS CONSENT FORM WILL BE FILED IN AN AREA DESIGNATED BY THE HUMAN SUBJECTS COMMITTEE WITH ACCESS RESTRICTED TO THE PRINCIPAL INVESTIGATOR, JANE ANN NEWMAN, M. S., OR AUTHORIZED REPRESENTATIVE OF THE SPECIAL EDUCATION AND REHABILITATION DEPARTMENT. I UNDERSTAND THAT I DO NOT GIVE UP ANY OF MY LEGAL RIGHTS BY SIGNING THIS FORM. A COPY OF THIS SIGNED CONSENT FORM WILL BE GIVEN TO ME.

Subject’s Signature  Date

Investigator’s Affidavit
I have carefully explained to the subject the nature of the above project. I hereby certify that to the best of my knowledge the person who is signing this consent form understands clearly the nature, demands, benefits, and risks involved in his/her participation and his/her signature is legally valid. A medical problem or language or educational barrier has not precluded this understanding.

Signature of Investigator  Date
March 23, 1993

Jane Newman, M.S.
Department of Special Education & Rehabilitation
Education Building, #412
Main Campus

RE: AFFECTIVE EMPATHY TRAINING WITH SENIOR CITIZENS USING ZAZEN (ZEN) MEDITATION

Dear Ms. Newman:

We received your 20 March 1993 letter, revised research proposal, revised consent form and revised advertisement for your above-cited project. Regulations published by the U.S. Department of Health and Human Services [45 CFR Part 46.101(b)(2)] exempt this type of research from review by our Committee.

Thank you for informing us of your work. If you have any questions concerning the above, please contact this office.

Sincerely yours,

William F. Denny, M.D.
Chairman,
Human Subjects Committee

WFD: sj

cc: Departmental/College Review Committee
Appendix F: Resumes of Trainers
VITA
Thomas H. Herbst

Home Address
P. O. Box 888
Superior Arizona 85273

Telephone Numbers
(602) 363-7118 Home
(602) 363-5561 Office

Professional Objective - Alcohol and Drug Counselor Position in either outpatient or residential setting for adults.

Summary of Qualifications

Four years teaching experience in the Commonwealth of Pennsylvania public schools (three years inner city Junior High School and one year Senior High School both inner city and suburban). My final year in Junior High School was spent as a critic teacher supervising student teachers.

Twenty five years experience counseling youths and adults having mental, emotional, and behavioral problems.

Arizona state certified addictions counselor.

Recognized ability to relate particularly well with elementary age youth as a result of raising four sons and entertaining them and their friends.

Professional Preparation


Bachelor of Arts degree, History major, English/Psychology minor, The Defiance College, 1963.

Professional Experience

April 1993 to present

Outpatient therapist, Copper Basin Behavioral Health, a rural outpatient clinic in Arizona. Provide direct counseling and programmatic services to the Seriously Mentally Ill and Substance Abusing population. In addition to providing general mental health services to children and adults.
Vita - Thomas H. Herbst

February 1989 to April 1993

Executive Director/Clinical Director/Outpatient Therapist for Copper Basin Behavioral Health Services. Includes much of what I am doing now plus all of the clinical directing and administrative duties of the agency. (In my desire to relocate with my wife, who recently received her Ph. D., I thought it wise to step down from the Director's position while seeking employment).

January, 1984 to November 1988

Executive Director, PASAR, an urban outpatient alcohol and drug treatment center. My duties were both administrative and clinical.

September, 1981 to January, 1984

Outpatient drug and alcohol counselor for PASAR.

May, 1979 to September, 1981

Program Director, Arizona State Department of Corrections, Catalina Mountain Youth Treatment Center.

September, 1975 to January, 1979

Director of Butler County Pennsylvania Foster Home Program for delinquent and status offending youth.

September, 1968 to September, 1975

Unit Director at Warrendale Youth Development Center, Warrendale, Pennsylvania. This was a treatment center for delinquent males.

June, 1964 to June, 1968


Certifications

Arizona State Certified Addictions Counselor (#SA-0378).
Certified by the Arizona Board for Certification of Addictions Counselors.
Vita - Thomas H. Herbst

Honors

ADAAPT Man of the Year, 1984 - An award for excellence in the treatment of addicts and alcoholics.

Past President of the Arizona Board for the Certification of Addictions Counselors.

Past President, Superior Rotary Club, Superior, Arizona.

President, American Disabilities Act Advisory Board - Kearny, Arizona.

Other Pertinent Data

Hobbies and Interests

Human Growth and Development
Physical Fitness
Music/Art
The Outdoors
Athletics
Letters

References

Available upon request.
RESUME
Jane A. Newman

Home Address
P. O. Box 748
Kearny, Arizona 85237

Telephone Numbers
(602) 363-7118 Home
(602) 363-5561 Work

Professional Experience

May, 1989 to present
Clinical Director for Copper Basin Behavioral Health, a community mental health center located in rural Arizona and includes an Hispanic culture. Responsible for implementing and designing clinical programs for individuals, families, children/adolescents, severely mentally ill, and senior citizens in the areas of mental health, substance abuse, child abuse, eating disorders, crisis intervention, and prevention. Responsible for a client caseload and for the supervision and training of clinical staff and volunteers. Thomas H. Herbst, M. Ed., Executive Director (602) 363-5561.

January, 1991 to present
Part-time instructor for Central Arizona College, Aravaipa Campus. Instruct classes in Psychology and Human Development at the community college level. Dr. Hill, Dean (602) 357-7864.

January, 1987 to May, 1989
Clinical Director for The Family Guidance Clinic, a community mental health center located in rural Arizona and includes an Hispanic culture. Responsible for the supervision and development of the residential and outpatient programs. The programs were geared towards individuals, families, groups, children/adolescents, and severely mentally ill in the areas of mental health, substance abuse, child abuse, eating disorders, and crisis intervention. Developed and implemented prevention programs in the local school system (K-12). Responsible for a client caseload and for the supervision and training of all clinical staff and volunteers.

Assistant Executive Director for The Family Guidance Clinic. Responsible for budget projections and budget development. Responsible for the supervision of all staff. George Breed, Ph.D., Program Director (602) 774-6359.
Resume - Jane A. Newman

January, 1985 to January, 1987

Clinical Director for The Haven, a residential treatment center for women with substance abuse problems located in urban Arizona. Responsible for the development and implementation of a residential program and a transitional halfway house program. Responsible for the supervision and training of clinical staff.

Interim Director for The Haven. Responsible for the supervision of all programs and staff. Responsible for the implementation and development of the budget and the fiscal planning. Angel Parker, Ph. D., Executive Director, 7 Washington, Concord, NH 03301.

May, 1979 to January, 1985

Program Manager for the Chronically Mentally Ill population at Palo Verde Hospital located in urban Arizona. Responsible for the development and implementation of the Chronically Mentally Ill program and for the therapy of other inpatients in the areas of mental health, substance abuse, crisis intervention, and art therapy. Responsible for vocational testing of referred inpatients. Robert Edison, Assistant Program Director (602) 795-4357.

Other Relevant Experience

Taught seminars in counseling skills to graduate students while in the doctoral program at various times. Assisted in teaching an undergraduate class in Dependency Populations.

Professional Preparation

Doctor of Philosophy, University of Arizona, Tucson, Arizona: Major in Rehabilitation Counseling with a Minor in Educational Psychology. December, 1993 (ABD).


Bachelor of Science, University of Arizona, Tucson, Arizona: Major in Rehabilitation with a Minor in Psychology. May, 1979.
Resume - Jane A. Newman

Certifications

Certified Rehabilitation Counselor (15690)
Arizona State Certified Counselor (CC-0890)
Arizona State Certified Community College Instructor (09398)

Honors

Woman of the Year - 1979
Honors Convocation - Senior Scholarship Award - 1979

Honor Societies

Phi Lambda Theta
Phi Delta Kappa

References

Available upon request
REFERENCES


